MOTOR AGE

THE ROLLS-ROYCE OF ENGINES

THE ROLLS-ROYCE OF MOTOR CARS

THE ROLLS-ROYCE OF ROTARY PUMPS

THE ROLLS-ROYCE OF ROTARY VALVES

THE ROLLS-ROYCE OF ROTARY SEALS

THE ROLLS-ROYCE OF ROTARY PRESSURE GAUGES

THE ROLLS-ROYCE OF ROTARY SPEEDOMETERS

THE ROLLS-ROYCE OF ROTARY TACHOMETERS

THE ROLLS-ROYCE OF ROTARY SPEED INDICATORS

THE ROLLS-ROYCE OF ROTARY TIMERS

THE ROLLS-ROYCE OF ROTARY SPEED CONTROLLERS

THE ROLLS-ROYCE OF ROTARY SPEED REGULATORS

THE ROLLS-ROYCE OF ROTARY SPEED GOVERNORS

THE ROLLS-ROYCE OF ROTARY SPEED RECORDERS

THE ROLLS-ROYCE OF ROTARY SPEED TRANSMITTERS

THE ROLLS-ROYCE OF ROTARY SPEED RECEIVERS

THE ROLLS-ROYCE OF ROTARY SPEED TRANSMITTERS AND

MOTOR AGE

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Contents

DEPARTMENTS

ALCO

Motor Cars

Good Hardware

What It Means in a Motor Car

THE quality of a house is often judged by the quality of its hardware. So it is in a motor car. Good hardware, especially a lock, is sometimes told by its ring. When the door of an Alco is closed there is a definite little click that indicates hardware of quality.

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MOTOR AGE

Team Match Contest Worth Trying

Interclub Reliability Popular in Chicago — Fifth Annnal Test Just Decided, C. A. A. Winning

By C. G. Sinsabaugh

CHICAGO, June 29—In the interclub team match Chicago has a mode of contest that is peculiarly its own but which furnishes the germ which could be emulated in clubs in other parts of the country with great profit to the sport of motoring in that such affairs do more to increase the interest of the owner in touring than any other form of contest run under the jurisdiction of the American Automobile Association. At least that is the opinion of Chicago motorists who have been participating in such events for the last 5 years.

This interclub proposition first was taken up by the Chicago Automobile Club and the Chicago Athletic Association in 1908 and since that time there have been eight such matches, six of which have been participated in by the two clubs originating the idea, and the other two have involved the Chicago Motor Club and the Illinois Athletic Club. In the case of the Chicago Motor Club,

INTERCLUB TROPHY AND CHICAGO TEAMS ON ROAD NEAR MUKWANOGO IN CHICAGO-MILWAUKEE MATCH

START OF C. A. A.-C. A. C. INTERCLUB TEAM MATCH FROM CHICAGO

it deviated from the original scheme a year ago when it carded a match for its own members, dividing it into two teams, one made up of amateurs and the other of tradesmen, while this summer it interested the Illinois Athletic Club in a match to Starved Rock and return.

The fifth annual interclub match was held when the Chicago Athletic Association and the Chicago Automobile Club, in which only amateurs contested, took place on Thursday and Friday of this week, the route being to Milwaukee and return. It attracted twenty-three contesting cars, twelve of which carried the colors of the Athletic club, while at least a dozen other machines took part in the affair as non-contestants and official cars, making a total of 130 motorists in the party. It resulted in a remarkably close finish in which the athletic club won with a score of 46.75 points against 58 for the automobile club. This makes the fourth victory for the Cherry Circle in the five times it has run against the C. A. C. for the Interclub trophy. The sixth match was for a different emblem.

Amateurs Show Skill

The results testify strongly as to the driving ability of the amateur who participates in such matches, for of the twenty-three contestants, fifteen went through the 2-day tour with perfect scores, while the eight who were penalized drew their black marks for trifling causes. On the winning side the chief offender was S. F. Weatherly, who ran his Pathfinder into the ditch near Libertyville yesterday, which cost him 43 points as a consequence. Before he was extricated from the mire into which he had sunk up to his hub, he had killed his motor twice, and clogged his feed line so that it was necessary to use an air bottle to clean out the mud. Coupled with this were points brought about by being late at the finish because of the accident. Of his three team mates, who were penalized, Frank Wentworth was given 4 points when his lighting system was shorted with his ignition, while the other four were given 1 point each for motor stops.

The Chicago Automobile Club finds considerable satisfaction, although defeated, in the fact that it had nine of its cars perfect and that, still more remarkable, its team went through the second day without a single point being charged against it. The two men penalized were E. T. Franklin and Charles Bosch, the former drawing a heavy penalty of 33 points for taking on gasoline outside of a control, which give him 3 points, and for being 30 minutes late at the noon control the first day. Bosch had trouble with his fan belt and was charged with 25 points. Had he know how to have used the device placed there for adjustment purposes, he doubtless could have escaped with a couple of points, but it was not until he had worked many valuable minutes that a Stearns man in another car stopped and pointed out how to adjust the fan.

Match an Enjoyable One

As for the match itself, the 2-day trip was a most enjoyable outing. Milwaukee is not very far from Chicago as the crow flies, but in order to get the distance John P. Dods, of the Official Blue Book, went there by a roundabout way and blazed the first day's trail over a distance of 136 miles, while he made the second day's run 120 miles. Over this route the contestants followed the schedule laid out of 18 miles for the first and last hours, because of city traffic in both Chicago and Milwaukee, and 20 miles an hour in between. The roads as a whole were fair, although there was considerable dust because of the dry spell this section has experienced the last couple of weeks. Several examples were encountered of how the roads can be improved by being oiled, while in one instance it was observed that calcium chloride was being tried as a dustlayer. Coming back yesterday the motorists were agreeably surprised to find the

INTERCLUB TEAM RESULTS

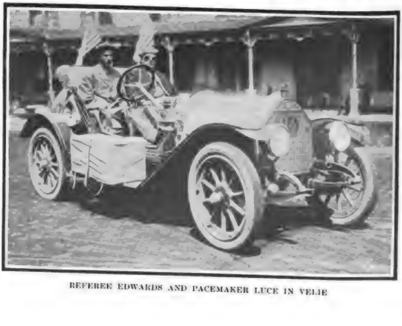
CHICAGO ATHLETIC ASSOCIATION

No.	Driver Car	Penalty 1st day	Penalty 2nd day
1	C. T. Knisely, Diamond T....	0	0
3	Frank Wentworth, Rambler...	0	4
5	W. F. Grower, Diamond T....	1	0
7	W. C. Thorne, Am. Traveler..	0	1
11	A. H. Gunther, Cadillac.......	1	0
13	C. A. Briggs, Chalmers........	0	0
15	W. Chamberlain, Rambler....	0	0
21	S. F. Weatherly, Pathfinder..	0	43
23	Harry Boulter, Locomobile....	0	0
25	W. Simpson, Winton..........	0	1
27	L. Jacques, Peerless..........	0	0
29	S. E. Hibben, Packard........	0	0
		2	49

Fractional penalization, 46.75 points

CHICAGO AUTOMOBILE CLUB

2	Allen S. Ray, Stearns........	0	0
4	G. F. Ballou, Apperson........	0	0
6	Charles Bosch, Stearns.......	25	0
8	J. T. Brown, Velie............	0	0
14	R. O. Evans, Apperson........	0	0
16	H. A. Ford, Premier..........	0	0
18	E. T. Franklin, Abbott-Detroit	33	0
20	G. F. Griffin, Peerless.........	0	0
22	W. M. Jones, Winton.........	0	0
24	F. E. Mann, Locomobile......	0	0
28	R. B. Wilson, Knox..........	0	0
		58	0



REFEREE EDWARDS AND PACEMAKER LUCE IN VELIE

STARTER DE LONG GIVING WORD TO KNISELY, C. A. A. AT MILWAUKEE

good roads enthusiasm that exists at Libertyville, where the highways are twice as wide as usual and dustless because of the oiling that has been done. In front of the summer home of Samuel Insull, prominent in the Chicago electrical world, there was a model strip of highway, ½ mile in length, which was as smooth as any Chicago boulevard and made of asphaltic concrete. This was the brightest spot seen on the road for 2 days of the tour.

While in Milwaukee the Chicagoans were royally entertained by the Milwaukee Automobile Club and the Badgers became so much interested in the interclub team proposition that it is almost certain that in the near future Milwaukee will undertake something of this sort. Chicagoans who were on the tour for the first time also became enthused and the result was that at the dinner given by the losing team last night Carleton White, president of the Chicago Athletic Association, which is an organization numbering 3,500 members, offered a trophy for a fall match between the two organizations, which is to be run in connection with the Allen S. Ray trophy, which already has been placed on the schedule of the two clubs for decision this fall.

Value of Interclub Matches

The object of Motor Age in going so deeply in this subject is not because of the news value of the match between the Chicago clubs, but to point out to motorists in general, and to clubs in particular, the benefits that can be derived from the promotion of similar contests. It seems that the manufacturers are not supporting contests so liberally as they have in the past, judging by the few events that are scheduled and the scarcity of those that are run, so something must be secured to take the place of hill-climbs and reliabilities which have been so common in the past. The interclub team match furnishes such an idea, it is thought. If confined to amateurs only it serves the purpose of arousing the interests of owners in contests primarily, and at the same time it shows them the possibilities of touring. It gets into the country men who seldom if ever drive their cars off the city boulevards, it stirs up motoring interests in the towns through which the tour passes, it calls attention of wealthy men who participate to the fact that the country roads are in need of improvement, and thus gains for the highway cause many powerful allies. It brings into competition makes of cars whose manufacturers hold aloof from the ordinary contests, and it also effectively demonstrates to the owner himself that with the modern motor car, now so staunchly constructed, trips of 250 miles are mere child's play and that mechanical troubles are no longer the bugaboo they used to be.

CHIEF CHECKER BRANSTETTER TAKING W. F. GROWER'S CARD

It was in 1908 that the idea of team matches between clubs first was conceived. The idea hardly was original because the same scheme had been tried in the Glidden tour but not with the success, however, that the clubs encountered when they tried it. The Chicagoans believed that by making it a team affair that enough club spirit could be aroused to assure success from the outset, while the friendly rivalry between the two clubs themselves would be sufficient to add a dash of ginger to the contest. So it proved. From the very outset the team match was a success and as the years have rolled by the teams have grown in size and owners who never before have been interested in contests have gone into the competition with great vim and vigor, with the result that the sport in Chicago at least is on a much sounder basis than it used to be.

Rules Are Made Easy

Necessarily rules for such a team match have to be as lenient as possible where amateurs are concerned, and the technical examinations have to be avoided because owners hardly could be expected to compete with cars that are kept in a condition that makers' entries are. Therefore, the Chicagoans started in by penalizing only for work done and for being late at controls. This is the grade 3 contests of the American Automobile Association, but Chicago adopted it before the national organization did. With this for a basis the rules have been worked up so that they apply to the team idea rather than to the individual. Because of this the regulations used in the match this week differ to a considerable extent from the A. A. A. rules. While the penalizations themselves are the same as approved by Chairman Schimpf, the Chicagoans do not penalize a contestant more than 400 points for the entire match. This is to encourage the drivers to finish, and also to prevent

SCENE ON INTERCLUB ROUTE NEAR WAUKESHA

as far as possible one man wrecking a team's chances because of mechanical trouble. The rules also specify that in case any drivers are more than 2 hours late they shall be given a penalty of 200 points and if more than 3 hours late 250 points. But, even when these demerits are tacked on the maximum penalization cannot be more than 400 points. Tire troubles are not penalized except that it is compulsory to finish within the 2-hour limit in order to avoid black marks.

Regulations Standardized

Both the Chicago Automobile Club and the Chicago Athletic Association believe that after five matches they have their rules in such shape that they may almost be considered standard and it is not at all improbable that before another summer rolls around the American Automobile Association may adopt the team regulations as standard for the entire country, no provision for team contests having been made by the national body so far. Pending such a probability and believing that possibly clubs in other cities than Chicago may wish to attempt something of this sort, Motor Age gives in brief the rules that were used in this week's match. They are as follows:

Rules Governing Contest

Course.—The fifth annual contest for the interclub trophy shall be held over a course starting from Grant park at Van Buren street, Chicago, to Milwaukee, Wis., and return, finishing in Grant park, following an itinerary a copy of which will be furnished to each entrant. The hour of start will be 9 a. m. each of the 2 days. It shall be a 2-day contest, with the night control at Milwaukee. There shall be a noon control each day—one at Lake Geneva the first day and the other at Burlington the second day. The time schedule of controls will be supplied each entrant.

Entries.—The contest shall be a team match between teams composed of members of the two organizations above named, no one of whom shall be in any way connected with the motor trade. The car must be owned by the entrant. Sons of members may drive as heretofore. The winning team shall hold until the succeeding contest the Interclub trophy, donated by the Chicago Athletic Association and Chicago Automobile Club. The losing team shall pay for a dinner to be given the winners immediately following the completition of the match.

Cars.—There shall be no restriction as to cars entered other than that they shall be fully equipped according to catalog specifications.

The contest shall be run under grade 3 of the American Automobile Association classification, which reads as follows: "A contest of any duration in which penalties are imposed for time and road work only, but in which the final operative test and preliminary and final technical examinations provided for in Rules 435, 502, 504, 505, 506 and 516 are omitted, shall be known as a contest of the third grade."

Penalizations.—The winning team shall be that team which has the fewest penalizations according to the following schedule:

TIME

One point per minute or fraction thereof, late in arrival at any control or checking station, each car being given a leeway of 3 minutes to allow for a difference in watches. In case of penalization due to work done on the car on the road, the time taken in doing the work will be added to the running time to the next control.

WORK

One point per man per minute, or fraction thereof, for labor by driver or passenger.

Two points per man per minute, or fraction thereof, for labor by workmen other than driver or passenger.

Two points per man per minute, or fraction thereof, for replacement of damaged parts by drivers or passengers.

Four points per man per minute, or fraction thereof, for replacement by workmen other than driver or passenger.

Three points per occurrence for replenishing gasoline, oil, or water, outside of fuel controls.

MOTOR STOPS

One point per minute, or fraction thereof, for motor stop when no work is done. No penalty for motor stop during period when work is being done on car, for which work or replacement a penalty is imposed. There shall be no penalty for motor stops occasioned by signals of drivers of horse-drawn vehicles, observer to be the judge.

Rule 519. Motor Stops.—Motors may be stopped at controls and while gasoline is being taken on. Other stoppages of motors between the starting and finishing of each day's run, except for tire trouble, will result in a penalty of 1 point per minute or a fraction thereof for time stopped when no work is done on car. No penalty, however, shall be charged for a motor stop during the time occupied by a replacement or work in a car for which replacement or work a penalty is imposed. Cars can check in at the night controls only on schedule time just the same as at noon. If entrants get in control ahead of time, motors must be kept running until time is up.

Motors of White steamers may be stopped for not exceeding 10 seconds in order to disengage the clutch when stopping or starting the car; also the motors of Stanley steamers must necessarily be stopped while the car is stopped. Steam cars may be stopped without penalty in order to replenish the water tank at the fuel controls. Cars cannot voluntarily leave the course.

Stopping the motor to put on tire chains will be permitted.

There shall be no penalty for tire work except in case the contestant fails to finish within 2 hours of his scheduled time at any control, when he is penalized 200 points; if more than 3 hours late, he is given 250 points for that day. Failure to finish either day's run incurs a penalty of 250 points or 500 points for both days.

Motor stops will be allowed without penalty for tire repairing, but in such an event the tire must be entirely deflated by puncture or accident, of which the observer shall be the judge.

The total maximum penalization for any car shall be 400 points for both days, except in case of withdrawal.

A penalty of 200 points will be imposed for failure to finish each day's run within 2 hours of the scheduled time or for disqualification for any cause each day 250 points for that day.

A contestant withdrawing from the match shall incur a penalty of 500 points. If a contestant is more than 3 hours late at either night control he is automatically withdrawn from the contest and is penalized 500 points.

Lubricators must not be adjusted during the match, but grease cups may be screwed down at controls. Oil, water and gasoline may be taken on at controls only.

In working on tires a driver may receive assistance from passengers without penalty.

In working on a car a driver may receive assistance from passengers, but the usual penalties will apply.

Accidents to accessories will not be penalized in case of shock absorbers, which will be charged at the rate of 2 points per man per minute taken in repairing same.

In case the contesting teams are not of equal size, the smaller team will be penalized according to the above schedule, while the larger team shall be given a fractional penalization, the numerator of which fraction shall be the number of cars in the smaller team and the denominator of which fraction shall be the cars in the larger team.

In case of illness emergency drivers may be used.

Drivers must not rely upon information ob-

H. A. FORD, PREMIER, C. A. C TEAM

C. A. BRIGGS, CHALMERS, C. A. A. TEAM

R. O. EVANS, APPERSON, C. A. C. TEAM

F. C. LEWIN'S CHADWICK PRESS CAR, HAS TIRE TROUBLE

tained from observers as to route to be followed or as to any question as to penalties or rules.

Each car must be checked in with the starter 30 minutes before the start each day or else be penalized 1 point per minute for each minute late in reporting after that time. This means 8:30.

No women are allowed to participate either as passengers, observers or drivers.

Observers.—The joint committee shall appoint observers, one for each car, and said observers shall occupy the seat beside the driver throughout the run. Each observer shall be provided with a blank form on which record shall be made of any occurrence which receives penalization. He shall also see that this blank form is handed to the checker at each control or checking station, in order that the time of arrival may be stamped thereon, receiving same from checker after the time has been marked. At the end of the run the observer must sign his card and hand it to the judges at the finishing point.

Running Regulations.—Entrants must conform to the laws and ordinances of the road and shall show due consideration to other participants in the tour and other users of the highway. Arrest for violation of the speed laws will result in a penalization of 10 points for each and every offense.

Protests.—All protests as to entries must be made to the referee before the start. All other protests must be made during the run on or before noon the next day after the contest, and must be in writing.

Regulations.—Every entrant must become acquainted with these rules and by entering agrees to abide by them. He shall hold the Chicago Athletic Association and the Chicago Automobile Club harmless and indemnify them against any losses or damage directly or indirectly growing out of the operation, management or control of the car entered by him from the time it starts in the first contest until the completion of the contest.

LEWIS CHAMBERLAIN, RAMBLER, C. A. A.

J. T. BROWN, VELIE, C. A. C. TEAM

R. C. THORNE, AMERICAN, C. A. A. TEAM

The joint committee reserves the right to alter, amend, repeal or add to these rules up to the start of the contest, as it may in its judgment deem expedient.

Improving the Rules

Since the match to Milwaukee the joint committee representing the two clubs in the contest has been giving some thought to still more revisions of the regulations which, it is thought, would greatly improve the affair. Chief of these suggestions has to do with the perfect score cars. As it is now, there is no encouragement for those who go clean. A club could have all perfect but one and still lose. This was shown in the case of the Chicago Automobile Club which had nine of its eleven cars perfect and yet lost because of the heavy penalization of the two demerited. Therefore it is suggested that in the next match a credit of say 5 points be allowed for each perfect score recorded. This would offset to a large extent the penalties of the black sheep.

Another suggestion, and one that already has been adopted by the joint committee, is that in the next match there shall be a minimum of twenty cars to a side. More can start, and if they do fractional penalization will prevail, but each side must have at least twenty cars or be penalized a certain number of points for each car it is shy. It is felt that this will prevent so many scratches as there have been in the past. The two clubs have had no trouble in getting many to promise to drive, but when it comes time to start generally there is about one-third the cars missing. It would do no good putting on an entry fee, for this would not make the entrants keep their obligations, but it is thought that if they knew their club would be penalized in case they did not report for starting, they would be more apt to keep their promises.

One of the benefits accruing to owners in such a match is that it calls to their attention most forcibly the need of looking into the mechanical condition of their cars, and seeing that they are tuned up. Many owners are quite careless in this respect, ordinarily, and generally leave it to the garageman who sometimes is slipshod in his methods. But after going through such a contest as this the owner has it impressed upon him that there is something more to keeping up a car than filling the gasoline tank and looking after the lubrication. He finds that his car runs better if he looks after other things—looks at his springs once in awhile, examines the condition of the radiator, inspects his wiring, and a thousand other little things that all tend to keep a car tuned up. Captain Knisely of the Chicago Athletic Association team realizes that the mechanical condition of the cars has a lot to do with deciding such a match, and it always has been his custom to talk to each member of his team, advising each as to what should be done before starting in the match. This year he went even further and prepared what he calls the ten commandments which were sent to each team candidate and which contained advice that should be well heeded by owners, even if they are not going in a contest.

Contestants' Ten Commandments

The ten commandments are as follows:

1—Be sure that you have your tire chains on board and that they are in good condition.

2—Examine spark plugs and see that they are clean.

3—See that your magneto is working perfectly and that your storage battery is in good condition to run the car if necessary to switch over to battery

4—Carefully examine your electric wiring and its attachment at the terminals.

5—Better renew all oil and grease in engine, transmission and differential.

6—See that all spring clevices are tight and that spring shackles and pins are in good condition and well lubricated.

7—Flush out radiator, preferably preliminarily clean it with caustic soda and have sufficient supply of water in radiator when starting in contest.

8—Drain water traps below carbureter and gasoline tank to remove water. Also clean out strainers in gasoline line.

9—Put your best tire equipment on the wheels and see that all the spare equipment is in good condition.

10—Last but not least, see that your brakes, both service and emergency, are in proper condition.

Willys Takes Over Garford Company

Overland President Purchases Controlling Interest in Elyria Concern and Will Handle Line from Toledo Headquarters—Many Improvements in Plants Contemplated

TOLEDO, O., June 28—The finishing touch to the ambition of President John N. Willys, of the Willys-Overland Co., was given today when the deal was consummated by which Mr. Willys purchased the common stock of the Garford Automobile Co., of Elyria, O. There is $2,000,000 worth of the stock and the product will be handled through the Toledo sales department of the Willis-Overland Co. Mr. Willys' ambition has been to make gasoline cars to suit every purchaser and he feels that this can now be accomplished with the increased facilities placed at his disposal by the latest acquisition.

The Garford plant in Elyria is capable of employing 3,000 men and the concern makes a high-priced six-cylinder passenger car and 2, 3, 4, 5 and 6-ton motor trucks. The Elyria plant will in the future be operated at its full capacity, 3000 men. Mr. Willys now controls not only the Overland business at Toledo but the Gramm Motor Truck Co., at Lima O., the Auto Parts Co., at Elmyra, N. Y., and the Garford Co. They will all become part of the proposed $15,000,000 corporation which will be organized as soon as the secretary of state authorizes the increase in capital stock application for which will be filed within a very few days.

Enormous improvements are planned for the local plant of the Willys-Overland Co., and of the Kinsey Mfg. Co., both of which concerns will be doubled in capacity. It is expected to turn out 40,000 cars from the local factory during 1913. According to a statement made by a member of the Overland Company, orders for from 2,000 to 3,000 cars have been turned down within the past 6 weeks because of inability to turn them out. Orders for several thousand cars were lost during August September and October of last year on account of inability to turn them out fast enough to supply the demand.

Among the smaller improvements to be made by the Willys-Overland Co., will be the refitting and refinishing of the drop-forging department, the old garage and other buildings. Two huge drop forges are already on the ground ready to be installed, each having a pressure of 6,000 pounds to the square inch. New modern machinery will be intalled in the new building and will be constructed along the most improved lines for factory buildings. Several new additions have been platted near the Willys-Overland Co., and nearly 1,000 new houses are being constructed to take care of the men who are expected to move to the city to take positions in the factory when the improvements contemplated have been made.

HONORS FOR SPEEDWAY BUILDERS

Indianapolis, Ind., July 1—The business interests of the city will play a pleasing tribute to Carl G. Fisher, A. C. Newby, F. H. Wheeler and James A. Allison, owners of the Indianapolis motor speedway, when they give a dinner at the German House tomorrow evening. The dinner is to be in recognition of the services of the owners of the speedway to their home city and will be one of the first honors of the kind ever paid to an Indianapolis citizen.

There are to be about 100 guests, representing the substantial business interests of the community and the banquet will be $5 a plate. There will be numerous talks extolling the services of the guests of the evening to the city.

Mr. Fisher and Mr. Allison have recently begun the construction of Speedway, the first horseless city in the world. They also are owners of the Prest-O-Lite Co. and Mr. Fisher is the Indiana agent for the Packard and Stutz. Arthur C. Newby is secretary and treasurer of the National Motor Vehicle Co., while Mr. Wheeler is a member of Wheeler & Schebler, carbureter manufacturers, and of the Langenskamp-Wheeler Brass Works.

DE LISSER REJOINS AJAX COMPANY

New York, June 29—Announcement was made yesterday that Horace De Lisser has resigned as vice-president of the United States Motor Co. to take up the chairmanship of the board of directors of the Ajax-Grieb Rubber Co., maker of Ajax tires.

Mr. De Lisser has been with the United States Motor Co. since its organization, leaving the tire business to join with Benjamin Briscoe in that enterprise. His return to tires has been made necessary by the new plans of that company that are considered of great importance to the motor car industry as indicating the advance being made in the campaign for trade for it involves the establishment of a factory in Europe for the making of Ajax tires. Mr. De Lisser will leave for Europe on the Kaiser-Wilhelm der Grosse on July 30, to be gone 6 or 8 weeks.

HAYNES COMPANY ENTERTAINS

Kokomo, Ind., July 1—Beginning last Wednesday, about 300 salesmen and agents of the company were entertained 3 days at the factory of the Haynes Automobile Co. in this city. The city was decorated for the occasion, every business house displaying Haynes pennants, while in many show windows were exhibited parts of the Haynes car of the 1913 model.

The guests were cautioned not to spend any of their own money and as a safeguard, every guest was given fifty certificates, which were accepted as money by the Kokomo business houses. A tent was erected on the factory grounds for the visitors and the city was practically turned over to them during their stay.

On Wednesday morning an exhibition of building a complete Haynes car in 1 hour 15 minutes was given. There was an address of welcome by General Manager Warren of the company. Elwood Haynes gave an interesting talk on "Recollections." Other speakers included W. J. Morgan, on "The Birth of the Automobile," and J. M. Ballinger and R. M. Anderson, who spoke on carburetion.

NEW DETROIT FACTORIES

Detroit, Mich., July 1—After a comparative lull in factory expansion locally, building operations seem to have been resumed this summer on a comparatively large scale. The largest addition of which formal announcement has yet been made is that of the Chalmers Motor Co., which has authorized and will immediately begin construction of a new factory building, adjoining its present plant. The building will be four stories in height, conforming in materials and general design to the buildings already in use by the company. The length will be 191 and the width 71 feet. In the neighborhood of 55,000 square feet of floor space will be added to the plant.

Arrangement is also being made by the Chalmers company to still further increase its facilities by the erection of another building, also four stories high, and 400 by 60 feet. This will be practically a duplicate of the two main buildings of the present plant, each of which conforms to this size. The Chalmers company has more than 30 acres of room and has ample chance of expansion.

Building operations, it is understood, soon will be begun by the Cadillac company, which has been severely cramped for room during the past two seasons, and is at present using an immense tent near its plant. No definite announcement has yet been forthcoming, however.

The Briggs-Detroiter company has authorized a large addition to its plant north of Detroit, on the line of the Grand Trunk and Michigan Central, Bay City division. This company is one of the most prosperous of the smaller local factories and has been unable to fill its orders for cars during the season, which is its first. The new addition will almost double the capacity of the plant.

Building operations also are in progress at the Studebaker, Ford and Packard plants. This, however, is a normal condi-

tion, as the occasions have been rare in the history of these three companies, when expansion of some sort was not in progress.

Another firm which is adding materially to its facilities is the Poss Motor Truck Co. This is by means of a change of base, however. Up to date the Poss has been manufacturing in the old Anhut plant on Abbott street. The company has now purchased the plant formerly known as Brush runabout No. 2 at Euclid avenue and the Grand Trunk tracks, in the northern part of the city. Considerably more room is thus placed at the command of the company, which is understood to be very well backed financially and has been manufacturing on an increased scale of late.

That there are no more Buicks available for the local demand is the assertion of Clifford Starkweather, manager of the firm's local branch, who states that he has been forced to refund a large number of deposits on account of failure to make delivery on a specified date. Substantially the same condition prevails at the Ford branch, although scheduled deliveries dated some time ago are being made daily. The Studebaker corporation and the Cadillac state that the reserve supplies of their dealers are about exhausted, and both are making every effort to make a fair distribution of the present output.

Sales Manager Ernest R. Benson, of the Studebakers, says that the week just ended was by all odds the largest in the history of the company. Though all the returns are not yet in, he estimates that in the neighborhood of 2,500 E-M-F 30 and Flanders 20 cars were disposed of during the 6 days.

TUBE PLANT DESTROYED

Detroit, Mich., July 2—Fire completely destroyed the plant of the Detroit Seamless Steel Tubes Co. yesterday afternoon, doing $300,000 damage. Insurance covers three-fourths of the loss. No definite plans have yet been made, but it is given on good authority that the plant will be rebuilt on a larger and more extensive scale.

MAY LIST OVERLAND

New York, July 2—Special telegram—Application has been made by the Willys-Overland Co. to list its stock issues on the New York stock exchange and it is understood that such action will be taken. The tradeable total includes at least $15,000,000 of securities under the recently authorized increase in capitalization.

MARTIN CHOOSES INDIANAPOLIS

Indianapolis, Ind., July 1—The Martin Tractor Co. has been organized and incorporated with $150,000 capital to manufacture the Martin tractor here. Those interested are Charles H. Martin, Hugh R. Richards, F. B. Davenport, Edward D. Moon and George D. Thornton.

Change Pending in Rutenber Company

George Bowen of Syracuse Becomes Financially Interested in Western Motor Co. of Marion, Ind.—Rutenber Motor Co. Incorporated to Take Over the Business

CHICAGO, July 2—The incorporation of the Rutenber Motor Co. for $1,350,000 in Delaware last week was the forerunner of an important change in the Western Motor Co., of Marion, Ind., which long has manufactured Rutenber motors in that it marks the transfer of the business of the Western Motor Co. to the newly organized Rutenber Motor Co. and the infusion of new financial blood in the shape of George W. Bowen, of Auburn, N. Y., president of the Bowen Mfg. Co., of that city, maker of grease cups and other oiling devices.

Confirmation of this fact was secured today over the long distance telephone by Motor Age from J. W. Stephenson, general manager of the Western Motor Co. at Marion. While the deal has not been finally completed, it is as good as made, Mr. Stephenson says, and Mr. Bowen will be heavily interested from a financial standpoint. The name of the company will be changed to the Rutenber Motor Co. and Mr. Stephenson will remain as general manager and a large stockholder. With the new capital interested it is planned to double and probably triple the capacity of the engine plant at Marion.

RECEIVER FOR ATLAS ENGINE WORKS

Indianapolis, Ind., July 1—On application of F. H. Wheeler and George M. Schebler, Fred C. Gardner has been appointed receiver for the Atlas Engine Works by Judge Clarence Weir in the superior court. The action brought on an account amounting to $2,387.50. The receiver gives $50,000 bond and will continue the business. The Atlas has the trade right in the United States to manufacture the silent Knight engine. The company says proceedings were brought about by a temporary suspension of payments of the company's largest customer from whom $100,000 is due and also to request for an indefinite suspension of deliveries on its contract.

FORD ENJOINS DAYTON CONCERN

Cincinnati, Ohio, July 2—A temporary restraining order was issued in the United States circuit court by Judge Howard C. Hollister today against the defendants in the suit of the Ford Motor Co., of Detroit, against the Union Motor Sales Co. et al., of Dayton, Ohio, restraining them from in any manner representing or advertising that they can or have or will procure or sell to their members or customers or to any person Ford cars at less than the regular licensed prices of the Ford Motor Co. They also are enjoined from infringing in any manner whatever upon the Ford patents or confederating or conspiring with regular licensed agents of the Ford company so as to procure Ford cars.

The granting of the temporary order follows complaint made to the court by the Ford Motor Co. recently, in which it was set out that the defendants had fraudulently secured Ford cars at less than regular licensed prices and that the Ford patents had been infringed by the defendants.

L. A. Howard, of Dayton, one of the defendants named in the suit, stated today that the Union Motor Sales Co. would ask the court to set aside the temporary restraining order on the following grounds:

1—That the Ford company has no enforcible patents.

2—Even if the patent is valid the Ford company has no right of action against the Union Motor Sales Co., because it owned the cars which it sold and has the right to dispose of its personal property in any manner it desires.

3—That the contracts made by the Ford company with its licenses fixing the retail prices of Ford cars is in violation of the Sherman anti-trust law, as it tends to restrain trade and is therefore not enforcible.

This suit involves a mooted point in the relations of manufacturer and middleman.

GROSSMAN TAKES APPEAL

New York, July 1—Formal order has been issued by Judge Hand of the United States district court, allowing Emil Grossman, nominal defendant in the recent suit of J. H. Sager, involving patent rights on motor car bumper manufacture, to perfect an appeal from the decision of Judge Hough which sustained the Sager patent.

The opinion of Judge Hough was couched in doubtful terms, but the decree granted provided for a permanent injunction, and it is from that order that the Grossman party takes appeal. The case in due course will be presented before the United States circuit court of appeals. The actual defendant in the case is the United States Bumper Co. of Chicago.

ROAD LOAN HELD VALID

Baltimore, Md., July 1—The $1,500,000 road loan for Baltimore county has been declared valid by Judges Duncan and Harlan in the Circuit Court at Towson. This decision was reached in the case of Dr. William P. E. Wise, of Pikesville, against the good roads commission of Baltimore county in which the judges named dismissed the bill filed by the plaintiff.

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The Silk-Glove Car

"Winds wander and dews drip earthward; Earth whirls, sun rises and sets, and all, but to prosper a poor little violet."

THE car owner is the be-all and end-all of the motor industry; he is the personage to whom all must bow, whether engineer, factory superintendent, sales manager, branch manager, or salesman —he is the "poor little violet" for whom all work. He pays the bills, consequently all turn to him, all work to satisfy him, all labor to fulfill his desires, and more.

THESE are days in motoring when this "poor little violet" is receiving attention—attention that produces results when the owner-driver is touring or using his motor, no matter where. A glance proves it: Compare the motor car of today with one of 2 years ago—Mr. Owner-Driver has his self-starter, his electric lights, his quick-as-wink top curtains, his readily adjusted odometers, his maximum-hand speedometers, his demountable rims, his automatic windshields, his trunk racks for suitcases or special traveling trunks, his myriad-type lunch kits prolific with everything that the heart could desire, his road guide books, his sign boards, his road danger signals, his oiled roads—in a word everything except good roads in many places, and they are coming at express-rate speed.

TODAY everything is for the car owner's comfort: He can tour from season opening to season closing and have little worries as to his car. If he lives in a city where headlights are forbidden, the dash-controlled devices for lighting the acetylene headlights or the electric push buttons make it possible to turn these on when leaving the city limits or off when approaching the limits without even slackening speed or leaving the seat. His windshield is as nearly automatic as it can be—a pull backward or forward sets it in the desired position, not a wrench, pair of pliers or screwdriver being needed; not a reduction in speed is needed if the car ahead raises a dust cloud and the shield has to be put up only to be lowered a few minutes later. Should a rainstorm introduce itself the shield can be put in the rain-vision position without delay.

NOT alone in the matter of creature comforts is the owner-driver catered to, but exceptional care is taken that he be not crowded; that there be ample room to carry himself, his passengers and the luggage necessary for his comfort. This is accomplished in other ways than by the mere lengthening of wheelbase and increase of body dimensions. The former luxuries but present-day necessities are provided in such compact form that they take up but a minimum amount of space. The air for the tire, the gas for the lamps, not to mention his food and drink are supplied in bottles where they may be stowed away. Suitcases and touring trunks are designed to carry the maximum of luggage in the minimum of space; even the spare tires house tools or perhaps the feminine motorist's hats.

THERE is one factor in touring conditions today that can be improved and that is the top situation. To put up a top is a task and to lower it and fold all of the parts away another. If one person has to do the work it is particularly difficult and if a lady has to assist she is in danger of a pinched finger or perhaps a torn garment. Improvements are needed here. Already the quick-idea side curtain man has done his part and it is not any longer necessary to get all of the passengers out of the rear seat, get the mammoth cushion out of place and bring forth to daylight a medley of side and front storm curtains that have to be dusted off and laid out in order to get each into its proper place. But then the task has only begun, each has to be fitted, some finger tips almost ruined in working the curtain fasteners and perhaps by that time the drenching rain is nearly over.

IMPROVEMENTS are needed in the top field. Something practical is wanted to assist in raising and lowering the top so that one person can do the work. Some devices have been put on the market but the success of them has not been so pronounced as such devices merit, the reaso nfor which remains to be seen. The improvement role has been well launched in the quick-action side curtains and more will be done and can be done. The attaching and removing of cover slips for the top when folded is still a hard one-man job and often it calls for the muscles of two men to get the work properly done. Many improvements are needed before it will be safe for a lady to start off with the top down and hope to be able to get it up and properly adjusted before the rainstorm has drenched everybody. Improvements are needed in the tension straps from the front end of the top to the frame pieces at the side of the bonnet, as quite often these are difficult to stretch and the hasps so hard to attach or detach that assistance is needed. These matters must be improved and brought on a par with the ease of starting, controlling the lights whether electric or acetylene and doing other car works that the owner-driver must be fitted to look after.

IMPROVEMENTS are needed in jacks for elevating the wheels when making tire changes. At present the jack is a difficult device to handle, not that it possesses any defects, but owing to the inaccessible position in which it must be placed. There are cars in which it is worth the price of a new coat to get the jack properly placed and to work it. Many designers have talked about more accessible jacks, and although one or two really meritorious ones have been put on the market, they have been financial failures because the added cost made them a selling impossibility. The time will soon come when the jack bugbear will be solved and it will not be necessary to get on your knees in the dusty road or even lie on your side in the dust in order to get the jack properly placed under the rear axle in order to change a tire casing.

ONE tendency for next season, namely, cleaning the running boards of tool boxes and battery boxes, must be scrutinized so that accessibility is not sacrificed too much. When tools are taken off the running board and carried beneath the rear seat compartment it is an error. But on the other hand if they are positioned beneath the driver's seat it is a commendable change. This presupposes that the gasoline tank has been transferred from beneath the front seats to underneath the back of the chassis. For they can be removed from the space beneath the tonneau seat only by removing the cushion and raising the seat boards. Now that trunk racks are becoming so general it will be best to use a hinged door in the rear of the body. Many have avoided this because of the trouble of keeping the dust out, but there is little difficulty in solving such a problem.

Minneapolis-Winnipeg Route Blazed

Northwest's Reliability Will Last 7 Days, So Pathfinder Says

MINNEAPOLIS, Minn., June 30—The Mitchell pathfinder for the fifth annual reliability tour of the Minnesota State Automobile Association from St. Paul to Winnipeg and return to Minneapolis, arrived in Minneapolis Wednesday afternoon, checking at the Radisson Hotel, the end of the run, at 4:40. The total mileage of the run this year will be 1,098.4 and the pathfinder covered 1,195 miles in 9 days' running.

The Helena tour of 1911 had a total mileage a little under 1,400 miles and there was no technical examination before or after, while the 1912 tour which is scheduled to leave St. Paul July 24 will be a second grade tour calling for two examinations of the cars. In this way this year's run will be more severe so far as the score of the cars is concerned. The milage for each day's run as contemplated at this time will be as follows:

First day—Wadena, Minn., night control, 182 miles.
Second day—Thief River Falls, night control, 166.4 miles.
Third day—Winnipeg, where the tour will stay over Sunday, 177.2 miles.
Fourth day—Grand Forks, N. D., night control, 156.1 miles.
Fifth day—Wahpeton, Minn., night control, 164.1 miles.
Sixth day—Annandale, Minn., night control, 196.6 miles.
Seventh—Half-day run to Minneapolis, 56 miles.

The northern route provided a fair measure of good roads for the tourists and there are many beauty spots in good old Minnesota that will be viewed from the cars. The White Earth reservation will be crossed and real live American Indians will be seen at close range. A noon stop is planned at Mahnomen, in the heart of the reservation. Between Warren and Halloek, Minn., a section of 24 miles of the old Pembina trail, one of the oldest known roads in this Northwest country, will be traversed. This trail was used years and years ago by the ox teams of the Hudson Bay traders.

At Northcote, Minn., the 10,000-acre farm of Walter J. Hill, son of the railway magnate, will be crossed. In fact, the tourists travel for miles with nothing but the land of this bountiful farm in view.

All during the long trip of the pathfinder it was a noticeable fact that the fields gave every sign of a bountiful harvest. Wheat, even at this early date, was in good stand, in some places being up over a foot, while barley, rye and flax were thriving. Winding trails through big patches of woods, and in some places unexpected sandy hills; pretty lakes half concealed in the deep underbrush; mile after mile of open prairie running where the road consists of two ruts for the wheels, with high grass in the center—these are some of the delights to greet the tourists' eye with an appreciation of the beautiful. Immense wheat fields will also present a charming picture, indicative of the wealth of Minnesota, the highest per capita wealth of any state in the Union.

Thief River Falls motorists will throw the town open and will receive the tourists into their homes in case the hotels are crowded. Guides were furnished from town to town and the pathfinding party made excellent progress.

Forty-four miles out of Winnipeg the Mitchell was met by Winnipeg motorists who planned to escort them into Winnipeg. The roads after crossing the Canadian boundary were good clear in to Winnipeg. The last 8 miles into the city is being macadamized for a width of 60 feet, half being done at a time, and this extreme width is in keeping with the general plan of Winnipeg streets.

In return for their entertainment in Minneapolis 2 years ago the Winnipeg motorists will arrange an attractive program for the visitors. It is thought there will be an entry in the contesting class of nearly twenty-five cars, and at least a dozen more will join in the non-contestants' column at Red Lake Falls and Thief River Falls, while the Crookston, Minn., club is now planning to join the big tour at Dugdale, Minn., and hold its annual run to Winnipeg with thirty more cars. In this way over sixty Minnesota cars will roll into Winnipeg.

Plenty of rough roads were encountered from Grand Forks to Wahpeton. Fargo will be the noon control on that day and the tourists will cover 103 miles before they get time to eat. When the pathfinder covered the run there had been several days of boiling hot sun after a hard rain, and the road was baked into roughness for miles. If it should be wet when the tour is held, there will be provided a test for cars and drivers seldom excelled.

Wahpeton to Annandale, Minn., will give a long day's mileage with roads only fair. There are lots of hills, bad railroad crossings and bad culverts, and this day's run is really considered the supreme test of the entire journey. At Annandale there are several country hotels in the nature of summer resorts, and this night's stop will be one of the pleasantest on the entire run. A half day will be used to bring the cars the remaining 56 miles from Annandale to Minneapolis.

Coming Motor Events

*July 4—Wildwood, N. J., straightaway.
July 4—Track meet; Petersburg, Ind.
July 4-5—Track meet; Taylor Automobile Club, Taylor, Tex.
*July 4-5—Beach meet; Old Orchard Automobile Association, Old Orchard, Me.
July—Reliability run; Maine Auto Association.
*July 5-6—Road race; Montamara Festo Auto Com.; Tacoma, Wash.
*July 13—Hill climb; Forestville, N. Y.
*July 15—Reliability run; Wisconsin State Automobile Association.
July 8-13—New York motor car carnival.
*July 15-18—Cleveland News reliability run.
July 11—Automobile Board of Trade meeting; New York.
July 15-20—Reliability run; Wisconsin State Automobile Association, Milwaukee, Wis.
July 21—Track meet; St. Louis, Mo.
*July 22—Farm and ranch tour; Dallas, Texas.
July 22-27—Cadillaqua celebration at Detroit, Mich.
August 5-7—Pacific Highway convention; San Francisco, Cal.
*August 8-10—Galveston beach meet; Galveston, Tex.
*September—Commercial vehicle run; Chicago Motor Club.
September 17 — Grand Prix; Milwaukee, Wis.
September 20 — Wisconsin challenge and Pabst Trophy races; Milwaukee, Wis.
September 21—Vanderbilt road race; Milwaukee, Wis.
September 17-20—Fire engineers' convention; International Association Fire Engineers, Denver, Colo.
September—Track meet; Universal Exposition Co., St. Louis, Mo.
*October 7-11—Chicago Motor Club reliability run, Chicago.
October 12—Track meet; Rockingham park, Salem, N. H.
November 6—Track meet; Shreveport Automobile Club, Shreveport, La.

SHOWS

July 10-20—Canadian Industrial Exhibit; A. C. Emmett, manager motor section; Winnipeg, Can.
September 23-Oct. 3—Rubber show, Grand Central palace, New York.
September 26-Oct. 6—Exposition agricultural motor cars, Bourges, France.
November 8-16—Olympic show; overflow November 22-30 Agricultural Hall.
December 7-22—Paris salon.
January 4-11, 1913—Cleveland show.
January 11-18—New York show.
January 11-22—Brussels, Belgium show, Centenary Palace.
January 20-25—Philadelphia show.
Jan. 27-Feb. 1—Detroit show.
February 1-8—Chicago show.
February 10-15—Minneapolis show.
February 17-22—Kansas City show.
Feb. 24-March 1—St. Louis show.
March 3-8—Pittsburgh show.
March 8-15—Boston show.
March 17-22—Buffalo show.
March 19-23—Boston truck show.
March 24-29—Indianapolis show.

*Sanctioned by A. A. A.

CONDITIONS IN TASMANIA

Washington, D. C., July 1.—Although the island of Tasmania in 1911 suffered from labor troubles, depression in the mining industry and a poor potato crop, it nevertheless made fair progress along trade and industrial lines, according to the Daily Consular and Trade Reports. The most significant gain in the import line from the United States has been in medium-priced motor cars.

American cars have taken a strong hold in Tasmania and are particularly popular with the commercial travelers, doctors, etc. A daily passenger line in competition with the government railway is now in operation between Hobart and Launceston, the two chief towns on the island, and covers a distance of 120 miles.

Society of Automobile Engineers Holds

Several Hundred Members Gather in Detroit and After Short Confab Embark on Steamer for 2-Day Trip During Which They Have Opportunity to Listen to Many Interesting Papers on Motor Topics Including Truck Engines, and Worm Gear

ENGINEERS ASSEMBLED AT FORD PLANT IN DETROIT

DETROIT, Mich., June 30—The regular annual summer meeting of the Society of Automobile Engineers was brought to a close Saturday night with the arrival at its dock in Detroit of the City of Detroit II. The session was most successful both from the standpoint of the actual society work accomplished and from a social point of view.

On the 2-day boat trip, nearly 400 members were present, and the innovation proved its value as a means of keeping the engineers together, inasmuch as there was no possibility of the sessions being meagerly attended, due to engagements elsewhere. No appointment could arise to disturb the peace of any member, nor to interfere with anyone's remaining to the end of a discussion.

Socially, the affair left nothing to be desired. The wives and daughters of the engineers were well taken care of and amusements on board ship were provided especially for their enjoyment. While the more serious matters of the convention were being carried on in the main cabin, the women of the party made use of the deck games and the card tables, all entering into the spirit of the affair and congregating here and there in little groups, for all the world like a little community which had a common interest and which had long been together.

First Session in Detroit

Although the meeting of the standards committee at the Pontchartrain hotel in Detroit on June 26 really was the opening of the convention, the society proper did not get together in session until the following morning in the convention hall of the hotel. At this opening session, the address of the president was first given, after which all general business was disposed of. The treasurer's report, the reports of the tellers of election and the report of the broaches division were heard at this time. Lord Montagu, noted English motorist, editor and publisher, who is making an extended visit to this country, addressed the convention at this opening session. Other engagements prevented his going on the boat trip.

Engineers Visit Ford Plant

In the afternoon of this first day, the society members visited the factory of the Ford Motor Co. in a body, where they were royally taken care of in their journeyings through the many parts of the immense plant. At the direction of Henry Ford, the entire factory was open to the visiting engineers and they were free to wander about as they saw fit. They congregated here and there in little groups in the mammoth machine shop, in the assembling room, the motor testing department and the stock room. The little blue and gold convention badge was all the passport necessary to gain for the wearer permission to visit any part or to watch any operation connected with the production of the Ford car which holds a unique position in the motor field.

PRESIDENT H. F. DONALDSON

In the evening, the women and the members went on board the steamer, which sailed for Mackinac island at 8 p. m., Thursday. Owing to the procrastination of some of the members in not advising the committee of their intention of taking the trip until the last minute, the accommodations were not sufficient to provide for some fifty of the party. A week before, when the entertainment committee headed by Howard Coffin had engaged the boat for the trip, its capacity had been amply sufficient for the number which had at that time signified their intention of going. Had this committee known of the exact number, a larger vessel would have been provided. However, the sportsmanship and generosity of the Detroit members was exhibited in their giving up their berths to the late arrivals, and contenting themselves with sleeping in improvised bunks in the passage ways.

Such a large delegation amply demonstrates the increasing activity of the members of the organization, and another year it is promised that one of the largest vessels on the lake will be procured. The attendance was far in excess of the hopes of the committee in charge.

Most Unique Annual Summer Meeting

President Donaldson Makes His Report, Showing Wonderful Growth of Organization, While Lord Montagu of England Delivers Address—Carbureter Division Makes Report—Discussions of the Various Papers Participated in by Prominent Tradesmen

MEETING OF ENGINEERS AT THE PONTCHARTRAIN, DETROIT, ON THURSDAY

The steamer arrived at Mackinac Island on Friday afternoon at 4 o'clock, where all went ashore, the ship not leaving until late in the evening. Here many of the staid engineers shook off their stately air and learned look and unbent to the extent of participating in the evening in snake dances and other festivities in the little summer resort street. Following the taking of a large group picture of the entire party immediately on arrival of the steamer, the island points of interest were visited and the old fort with its ancient block houses was seen.

The return trip was over a different course, the steamer calling at Port Huron on Saturday afternoon to permit any members who so desired to take trains for points east or west. Very few, however, abandoned the ship here and practically the entire part was again landed at Detroit in the evening of the second day.

Papers Thoroughly Discussed

Although not all of the business which was to have come up before this meeting of the society was not covered for lack of time, such matters as were considered were given the fullest discussion, President Donaldson believing that the information so imparted being of such value that it was better to have covered few of the papers and reports well than to have attempted to get over the entire program in a hurried and cursory way. This opinion was generally held by the other members. Those papers and reports which were not presented were put over until the January, 1913, meeting.

In opening the society's annual summer meeting, President Donaldson touched first upon the steadily increasing membership and the rapid growth of its influence in the motor field. He stated that the organization can view with satisfaction the technical work which it has already accomplished, and that it should use this as an incentive to greater and further effort. Along with its technical work he believes that the society can do a great work in bringing together the technical men of the motor industry upon whom its very foundations of the industry now repose. The address was:

> In welcoming the members of the S. A. E. on the occasion of the semi-annual meeting of the society, your president is able to report that the affairs and activities of the society are in a very satisfactory condition. The growth in influence of the society is reflected in the steady increase in membership, which now exceeds 1,300, a gain of about 60 per cent over the total membership at the time of the 1911 midsummer meeting.
>
> As you are aware, the membership committee has taken hold of the work vigorously and, with the active coöperation of the members, the results have been very gratifying. The work of the committee and the supervision of the council in passing upon the membership applications have been conducted in accordance with the provisions of the S. A. E. constitution.
>
> Since the last meeting of the society in January, the headquarters in New York have been removed from 1451 Broadway, at Forty-first street, to the new twenty-story building, 1786 Broadway, corner of Fifty-eighth street, in the center of the metropolitan motor district. A serious effort has been made to secure suitable quarters in the Engineering Societies Building, on Thirty-ninth street, but there was no unoccupied space that could be adapted to the uses of our society.
>
> The present quarters are close to all means of transportation on Manhattan Island and provide a practical home for the society on an economical basis. The members' room on the twelfth floor, about 30 feet square, commands a magnificent view of Central park, Columbus circle, upper Broadway and the Hudson river. This room has been comfortably furnished for the exclusive use of the members and contains files of the motor publications, writing desks, stationery, telephone, etc.

E. P. BATZELL

Recommends the Bulletin

> During the past 3 months the regular monthly publication styled the S. A. E. Bulletin has been undertaken and will be continued regularly hereafter. This provides a convenient means for periodical communication to the members of information about the activities of the society. It is in convenient, readable form, so that it can be preserved for constant reference, and already has been found to be an effective substitute for the mimeographic sheets which now are used only when it is necessary to send out important notices between the dates of publication of the S. A. E. Bulletin.
>
> A feature of the S. A. E. Bulletin is the listing of "Men Available" and "Positions Available" for the information of the members. This is the outward sign of an employment bureau maintained by the society for the service of which no fees are charged. The bureau has been very successful in filling vacancies for employers and finding positions for members suited to their capabilities.
>
> In no other one direction has the society so effectively contributed to engineering progress and the good of the motor industry as in the development of the so-called standards. Of all the activities of the S. A. E., the standards work has been the most discussed—the most praised and the most abused. The society is fortunate in having for chairman of the standards committee a member who combines brawn with brain—although up to the present time his combats have been confined to intellectual encounter. An old proverb says that "The proof of the pudding is in the chewing of the string," and so while the mastication of the string has occupied the exclusive attention

TALKING IT OVER ON BOARD THE STEAMER

of some, others have already digested the standardization plums and appear to be well fed and happy.

The angles of approach are a delightfully Euclidean study. Some even assert that the term standard is a misnomer, which assertion recalls to mind the Shakespearian reference to a rose. What is a standard? Astronomers tell us that some of the celestial bodies get askew when the notion seizes them so that even such fixed and irrevocable things as stars become unstandardized.

Coming down to earth, we have the case of monetary standards which are not really standard—witness the proposal to coin ½-cent and 3-cent pieces in America, and the abandonment of the guinea, the 3-penny and 4-penny pieces in England.

And so with the standards of weights and measures—witness the sustained effort in England to substitute metric for imperial measures.

Others suggest the practical abandonment of standards, foreseeing the impossibility of getting nation-wide acceptance. For such there is encouragement in the history of the metric system. About 40 years after its adoption by France, the government was obliged to pass laws providing severe penalties for the use of any other system of weights and measures. The S. A. E. standards have had a more speedy acceptance, even if they have been only "accepted" by the society and not "adopted," a fine distinction that gives comfort to many able minds.

Suggests "Recommended Practice"

As a result of familiarity already gained in standards work, and having in mind the long continued and highly successful standards experience of the Master Car Builders' Association, the council of this society has decided that in future the conclusions reached by standards committees will be designated "recommended practice." When such practice is confirmed by general usage, the term "standard" may be applied. To suggest standards applicable in perpetuity is to assume a lack of information and capability on the part of those who will take up the work of construction when we are only a memory.

The important work of revising and adding to the S. A. E. handbook has been entrusted to a new professional committee styled the handbook and data sheet committee. This committee has been selected with a view to the special experience of its members in such work and has now in its possession a large amount of engineering data which will be critically examined and edited for publication. As the work of this committee is one of the most important undertakings of the society—of direct benefit to a large majority of the members—the active coöperation of every member is invited. Contributions of data, whether in tabular or graphic form, or as memoranda, will be thankfully received by the committee. The data sheets already issued are of great value to motor engineers and are really an indispensable part of the designers and drafting room equipment.

Every member of this society recognizes that there are many obscure problems connected with the design and construction of motor vehicles that are still unsolved. The habit of mind which is best fitted to cope with problems of production is not the most efficient when applied to the consideration of abstractions. Much good work has been done in the service of motor car manufacturers, but there is always present, even unconsciously, the limiting effect of a salable product, which indeed is the ultimate purpose of the so-called experimental department of the car factory. Therefore it will be of much interest to the members of the industry to know that the society is now in correspondence with the United States bureau of standards, in Washington, for the purpose of reaching a basis of agreement whereby the bureau can conduct scientific investigations of problems in carburetion, ignition and the like. It is unnecessary to lay an emphasis upon the value to the industry of determinations reached by the United States bureau of standards which is preëminently the scientific authority in its field in America.

Co-operation Promised

Coöperation upon somewhat similar lines has also been promised by the laboratory of the Automobile Club of America and the laboratory of the University of Michigan, both of which are well equipped in personnel and material to assure the most valuable results.

Another gratifying development of the standards work of the society is the approval of the S. A. E. motor truck wheel standards by the National Association of Automobile Manufacturers. Also, at a recent conference between members of the S. A. E. truck standards committee and the N. A. A. M. commercial vehicle committee, an agreement was reached whereby the work of the two committees will be coördinated, the N. A. A. M. committee confining its investigations and recommendations to standards of a commercial character, and the S. A. E. committee to those of a more technical character, relating particularly to chassis construction. At this conference the cordial relations existing between the two great organizations in the motor car industry the one commercial in character and the other technical—were strengthened and a united effort for the good of the industry agreed upon.

Your president recommends that a serious effort be made by the society to accumulate historical engineering data for preservation in our library. There are doubtless many drawings and photographs of early models now available which will have a constantly increasing historical value and which owing to their obsolete character and the usual limitations of storage space in a manufacturer's office may be destroyed. It ought to be one of the functions of this society to collect and preserve such material and the coöperation of all members is invited.

Lord Montagu Talks

Following this, Lord Montagu was called upon to address the convention. The keynote of his remarks was standardization and he brought out its advantages and disadvantages, its limits and its scope, in a masterful and most comprehensive manner. His views were all the more valuable since they gave an insight into the attitude of the English motor fraternity on this much discussed subject. He said in part:

I esteem it a great honor to say a few words, as I represent to a certain extent English motoring. I listened to your president's address with great interest, as I saw in it reasonable standardization the same as is being aimed at today in England. But as in England so here, you will have some difficulty if you try to raise standardization too high. There are several difficulties that will arise if you try to go too far in this work: In the first place your trade is very international, as can be seen on the main roads of England and France, where you see American-built cars in great numbers, and in considering standardization and replacement of parts you must take into consideration the standardization of the industry as it is carried on in England and France.

Montagu on Standardization

Second: When people talk standardization they forget that all invention must come as a spur of dissatisfaction. Some engineer has become dissatisfied with some parts of the car and sets about to correct it; and in this great motor movement it would be a disastrous error to place a limit on inventive genius or in a word to say how the coat should be cut or how the hair should be trimmed, as it is only in certain directions that standardization must be carried on.

Standardization has many advantages to the car maker and the car buyer, but do not press it too far if you want to continue healthy rivalry and research work. Standardization pressed too far is bad.

In England and France we are all endeavoring to standardize where possible. To be specific, we might have two or three or four sizes of wheels, but standardization work would simplify the work of wheel and tire makers. You can standardize on nuts, bolts, rivets, tubes and steering wheels, but if you go into carbureters and gearsets both are today in their infancy and you would make a mistake if you limited the activities of the engineers in any way in relation to these parts.

Frequently outsiders see more than engineers in a problem of this nature, and taking a world-wide survey of this great world-wide revolution of transportation—the motor car—you are talking on something that can not come for years to come.

Take a parallel in locomotive engineering: Here not until the last few years in England and France have they got any standardization and here I see a difference as one locomotive for hauling freight from Buffalo to Cleveland must be entirely different from one needed to haul from Kansas City to California over the mountains. The different loads and road conditions call for differences in locomotives.

On behalf of the English engineers we desire to co-operate in this great work and we are glad to welcome you and your cars to our shores, as it spurs our makers to higher efforts and we appreciate your cars on our shores.

Miscellaneous business of the convention then was taken up, the treasurer's report being heard and also that in regard to the membership. The former showed that for the first 6 months of the year, there was a balance on hand which was slightly in excess of $3000. As to the membership, it was stated that there was an increase in enrollment of 206 since

W. P. KENNEDY

the first of the year, bringing the total up to an amount slightly in excess of 1300, a very commendable showing indeed. The classes of new members since the first of January 1912 are:

Regular members	83
Associate members	89
Junior members	30
Firms	4
Total	206

The total enrollment as it now stands is 60 percent. greater than it was at the time of the midsummer meeting of last year. Such a large increase only brings out forcibly the fact that motor car engineers and others in the motor car profession are fast coming to realize the importance of the society as a factor in the industry and therefore are lending it their support.

S. A. E. Boards the Steamer

After a reading of the report of the broaches division and discussion of its premises, as taken up elsewhere in this issue, the convention adjourned until the following morning on board the City of Detroit II.

PLAYING SHUFFLEBOARD DURING THE VOYAGE

The work of this summer's session of the society may be said to divide itself into four parts. The consideration of the reports of the various divisions of the standards committee and the discussion which each provoked was perhaps the most important work of the convention. The paper by E. P. Batzell on "Motor Sizes and Drive Ratios for Commercial Vehicles" was the basis for a lengthy and profitable discussion on this and related truck matters. Another division was that on motor testing, of which the paper by Herbert Chase on "A Comprehensive Motor Test" and that by H. L. Connell on "Standardization and Co-operation in Motor Testing" formed the foundation. "Worm Gearing" was the fourth general subject discussed, Frank Burgess opening the very pertinent matter with his paper on "Worm Gears."

Henry Souther, chairman of the standards committee of 100, ably outlined the work of this body at the opening session on board the steamer in a very comprehensive paper of some length. Within the last year the standards committee work has been criticised, largely through misunderstanding by those not in close touch with its work, and it was Mr. Souther's aim to clear up all doubt as to the scope and character of the proceedings of this most important committee of the society. A great variety of viewpoints have been taken by those who comment and criticize.

R. H. ROSENBERG

"There is the class which believes that a standard, in order to be worth anything at all, must not be adopted or recommended until everything is known about the subject," Mr. Souther said, in part. "In contrast, there is the class which seems to believe almost anything can be standardized and which would go to very great extremes in the matter. There is apparently a sharp division of opinion between these two groups. One believes that standardization should begin early in the history of an industry. The other believes that no standard is possible in an industry until such industry is so old that the probable changes in the proposed standard are few and far between. These views are diametrically opposite and require consideration.

Henry Souther's Ideas

"To me it seems that portions of a construction may be standardized at a given time and that other details must wait further developments. It is most desirable to have the few agreed points standardized rather than do nothing at all. The whole question of standardization is interesting to the engineering world. It is viewed with the most favor by those who have gone deepest into the subject. It is viewed unfavorably by those who do not understand what kind of a standard is aimed at. Perhaps it would be well to call all the results of the work of your committee 'Standard Information' or 'Standard Practice,' rather than 'Standards.'

"Another view of a standard apparently taken by some contemplates the fact that a standard once adopted by the S. A. E. must be used by all its members or else they shall forfeit their rights to membership or citizenship or something else not expressed. This is certainly not the case. The adoption of a standard is not compulsory; it is voluntary.

"There are many more details of a motor car that should not be standardized. To draw the line in a practical way between that which is fit material for standardization and that which is not, is the work of your standards committee and of the whole society."

Work of Sub-Committees

The status and the progress of each of the divisions of the committee were gone into by Mr. Souther. He explained why some of the sub-committees were burdened with particularly difficult matters and stated that in some cases, such as the springs division, it was almost impossible to arrive at anything which could be standardized, owing to the multiplicity of factors entering into the consideration. Also in speaking of the frame sections division he brought about the same point in saying that it is a grave question as to how much about a motor car frame is susceptible of standardization. It was shown that the personnel of each of the divisions included both manufacturers of the products under consideration as well as users of them, precluding any possibility for biased views.

In closing his paper Mr. Souther stated that if conservatively carried out there can be no question but that the work of the S. A. E. standards committee will be of the greatest value to the motor car industry. Free and open criticism and cooperation from all members is necessary at all times, however.

Before opening for discussion Mr. Souther's masterful exposition of the work of

H. L. POPE AND H. W. A. BREWER

the standards committee, a letter from Henry Hess, chairman of the gear tooth shapes division, reporting the progress of his committee was read. This report was received after Mr. Souther's paper had been prepared.

Henry Hess Sends a Letter

Mr. Hess stated that a paper by Lewis before the A. S. M. E. some time ago was of special value in connection with the work of the committee. Mr. Hess held a consultation with Mr. Lewis on the subject. A number of tests have been conducted to determine the friction and wear of different gear materials. Mr. Hess stated further that there is a fund of information to be had on the subject of gear shapes, and that much work has been done in many languages. The motor industry has the highest interest in gearing, he believes. His letter added that it would require a long time for the completion of a satisfactory report by the division.

The discussion on standards was opened by C. E. Duryea, in which he voiced his appreciation of the committee's efforts and stated that it was along lines with which all are interested. He raised objection to the use of the word "tread" instead of "gauge," the latter being the correct word in his opinion for the width between the centers of the wheels, whereas the former simply refers to the face width of the individual wheel.

J. G. PERRIN

H. W. Alden held the view that of the criticism which has been aimed at the standards committee within the last 6 months some were good and some did not amount to much. Accordingly he proposed a motion favoring the committee's work. This, however, was ruled out of order, to be taken up at the close of the discussion.

In answer to the charge which is often made that the committee's work tends to usurp the designer's field, Howard Marmon stated that there was no ground for this assertion, as its only aim was to assist.

Commends Committee's Work

C. E. Whitney expressed himself as being in full appreciation of all the work done by the committee, adding that the company with which he is connected has already saved much money by working towards the society's recommended standards.

There are anarchists and conservatives in every organization, Howard Coffin explained. Some of the suggestions for standardization are foolish, as for example, the suggesting of a standard thread for hub caps. This was rejected by the committee which believed the matter to be entirely too much of a detail. The real energies of the standards committee will be exercised along sane lines and for the common good of all concerned, he said.

H. W. A. Brewer, an English consulting engineer, was requested to give his views on the standardization matter. The one thing which most forcibly impressed him, he stated, was the live and business-like method in which the proceedings and methods of the society as a whole and the standards committee in particular were carried on. As in this country, standardization is being carried on in England, and much of the information which has been collected by the society is forming a basis for investigations there.

The largest difference which he finds is in the units of dimensions. He believes that we mix dimensions somewhat, that is, by using fractions and decimals. For example, in going over the S. A. E. data sheets he mentioned the promiscuous use of sixty-fourths of an inch in one place and thousandths of an inch in another. These should be made uniform. He referred to several illuminating passages in the reports as submitted and stated that they should all be extracted and sent around in small pamphlet form for the general good of all concerned. He added further that he was specially interested in the standardization of fittings for carbureters, since many of these instruments are imported from us and as it is now, whenever a new carbureter is installed on a car, it is necessary to alter the flange connections, the manifolding and so on. If on the products which are brought from this country, these things are made uniform on all makes, then the demand for American carbureter will increase to four time its present proportions. He remarked also upon the large number of tire sizes which are to be found in this country, stating that in England there are only four standard tire sizes. If the number in this country were brought down, it would effect economy in a number of ways. Dealers would not have to carry as large stocks for one thing.

David Fergusson had no criticism to offer on the Souther paper, but he was of the opinion that several of the matters decided upon by the divisions were at fault. For instance, he believes that the truck speed of 8½ miles for a 5-ton truck is too low, and states that the vehicle in which he is interested is designed for a speed of 13 miles an hour which he thinks most economical under all conditions. In the matter of tire sizes, he believes that some fallacy exists in S. A. E. standard sizes. In using a certain make of tire, his company is obliged to place an iron ring over the felloe to make up for the difference between the wheel diameter and that of the tire.

Merely Tentative Speeds

President Donaldson partially cleared the matter by stating that the recommended truck speeds were not society standards, but merely tentative figures as the result of straw vote by several manufacturers. The figures found their way into the data of the society by mistake.

Corroboration of this statement was made by W. P. Kennedy, who further said that the province of the committee which standardized truck wheels had nothing to do with manufacture of tires. It has fixed upon standard sizes for truck wheels and by so doing has greatly reduced the number of necessary sizes which the manufacturer must carry. Nearly all tire manufacturers are complying with these standards, but any difficulty which is experienced with the tires is not due to faults in the standards but to the persistency of the tire maker

is attempting to apply old forms of tires to new standards.

D. F. Graham of the ball and roller bearings division has found that in a general way the work of this division has benefited the bearing manufacturer and also the car manufacturer in that it is now made easier for both to get together on the matter of tolerances to be allowed and the clearances to be given inside and outside the bearings. The whole matter has been simplified, he added.

In regard to the general scope of the committee, J. G. Perrin stated that all are impressed with the possibilities and impossibilities of standardization. He believes that the changing of the nomenclature from the word "standard" to "recommended practice" will aid greatly in broadening the scope of the work. A great deal of good already has been accomplished. Standardization increases competition and gets away from monopoly, since more than one brand of any given product may be applied to a machine. Some of the points which now seem impossible of standardization will eventually lead to specific results.

Racing Cars Discussed

As an expert on racing cars, W. G. Wall was called upon to give his views. In the racing cars of his firm's make many standard parts have been incorporated, he stated. The society should and does welcome criticism and for that reason he had one suggestion to make. This was in the matter of the yoke and rod end standards, which were set 4 or 5 years ago by the A. L. A. M. and which were taken over by the S. A. E. These he believes are antiquated and should receive some consideration.

The experience of C. T. Meyers with the standards has been entirely in connection with truck work, as he stated. In all its work, his company is either using S. A. E. standards or is arranging to do so. Standardization in truck work is of the utmost importance so that branches and supply points will have all necessary parts and will reduce the time necessary for small replacements to the minimum.

H. L. Pope thinks that the work should be highly complimented and that it should be remembered that no standard is so fixed that it will not admit of change if it can be bettered thereby. He cited the example of the higher court's reversal of lower court decisions which it did not deem correct. For the most rapid advancement of the standards, each engineer should endeavor to follow them wherever possible, and if at any time he finds it impractical to do so he should advise the division concerned.

President Donaldson believed this latter remark to be very important and urged every engineer to follow the advice given. Cooperation is necessary for best results.

C. R. Watson looks at the matter from a slightly different standpoint, in that he also takes the garage man into consideration. Standardization is important for interchangeability and for stock. The garage man wants to carry as small a stock as possible and at the same time he wishes to please his customers with quick repairs. In this way the public derives the benefit. Standardization is the source of a factory's prosperity.

DAVID FERGUSSON AND E. T. BIRDSALL.

From his experience in tank making J. A. Steinmetz cited an example where the using of standard methods means a saving of $2,000 to $3,000 to one car maker. His order was for tanks which could be made with standard dies, and if this had not been the case, the extra cost would have to have been added for making special ones. On tanks standard iron pipe fittings are now used which cost in the neighborhood of 10 cents in any part of the world, whereas special fittings would amount to about $2, to say nothing of the saving in time for which the former are responsible.

L. S. Bowers stated that the wheel makers are much interested in the standards and he advocated the bringing into the fold of the resisting tire makers.

Following the discussion of the standardization subject a motion to the effect that it is the sense of the society that the work of the standards committee as outlined should progress, and that the society highly indorses its parts and principles, was carried unanimously.

Standards Committee Meets

On the day preceding the opening of the convention, the standards committee held its meeting, at which the division reports on steel, electric lighting, wheel dimensions, broaches, truck standards, frame sections, carbureter fittings, ball bearings, sheet metals, data sheets and lock washers were heard, and on motions duly seconded were referred to the society as a whole for consideration later in the week.

In all reports, progress was to be especially noted, many of the committees being so far advanced in their work that their reports were thought sufficiently good to be issued in pamphlet form. This applies to the sheet metals, broaches, carbureter fittings, springs, frame sections and ball and roller bearings divisions.

All of these are the third reports of these committees with the exception of the last named, which is a fourth report. The carbureter fittings division in particular has practically completed its work for the present, or until such time as there is need for new standards. Other committees which have particularly difficult tasks and which are collecting data on their respective subjects have thought that for a more comprehensive consideration of their work it would be better to simply report what has been done and to hold off more formal reports until the winter session. This last applies especially to the steel division.

It was reported that the recommendations of the lock washers division which were adopted at a session previous to this were favorably received by manufacturers and consumers. The large sections as laid down are somewhat heavy, but this is of small moment since they are for truck use and therefore are permissable. It has been found that most orders received by the lock washer makers from the car manufacturers now conform to the S. A. E. standards.

FRANK BURGESS

HENRY SOUTHER

J. B. Seymour stated that in the western territory of his company fully 60 per cent of the orders received were for S. A. E. sections, and he suggested that while some of the sections were heavy it would be best to let the present figures remain in force for another year so that their merits could be fully determined.

As to the electric lighting division, Alexander Churchward stated that no full report could be presented as yet, as it is rather hard to get the members to agree on the various points at present. The advent of the electric starter has brought about many complications in motor car wiring and lighting, he stated. Voltages run from 6 to 48 volts in the various systems now used, but the hope is to narrow them down to two at most within the next half year. Wiring methods also are variable, and Mr. Churchward favors the assistance of the fire underwriters to make them uniform. In his opinion, the wiring on some of the best American cars is almost criminal. While in some cases 200 to 300 volts are to be had at a short-circuit, protection against such is not often made. The wiring should be properly fitted with conduits, fuse blocks and the like.

I. J. Reuter was of the opinion that 75 per cent of the trouble is due to the wiring.

Churchward on Wiring

On the suggestion being made that the underwriters be asked to make recommendations for wiring, Mr. Churchward was authority for the statement that since the motor car voltage is low that body could not give many points of value. Their standards are on a 110-volt basis, and since the motor car lighting uses a 6-volt system, their standards would not be feasible.

W. P. Kennedy stated that he did not agree with suggestion to let the underwriters make recommendations. They have not the same viewpoint as the engineer, and for monetary reasons they run to too great factors of safety. As an illustration of this tendency, he cited the very exhaustive gasoline storage rules which were first formulated and which in many cases amounted practically to the use of a certain make of tank or apparatus. If the underwriters were allowed to make the suggestions, the motor car people would be penalized in these early stages before the insurance body is conversant with motor car lighting.

Sent to Fire Underwriters

After some discussion, a motion to present a set of recommendations for motor car wiring, insulation and so on to the National Board of Fire Underwriters with the idea of bringing the matter to a head was carried. This should help to bring about uniformity.

The lighting division has had considerable disagreement among its members as to lamp bases and sockets. A statement received from one of the large electric companies states that they are willing to standardize their product as soon as the committee has acted. The belief entertained by several of the committee that the sizes fixed upon by the division would sooner or later have to be made larger to meet the demand for stronger lights was not held by Mr. Churchward, who stated that the 16-candlepower 6-volt lamp as suggested by members of the committee will give two and one-half times the light of a ¾-inch acetylene gas burner. He therefore believes the now generally used 16-candlepower lamp to be sufficiently large, and that as soon as large lamps are used, there will be legislation against them on account of their blinding other drivers.

Mr. Kennedy stated that there was very little criticism among wheel users and manufacturers on the wheel dimensions already adopted, and he believes that it would be well to let the industry simmer down a bit on this matter before making further changes. The wheel dimensions division sent the following list of questions to the industry and almost every reply was favorable to the S. A. E. standards:

1—Is there anything impractical about them?

2—Do they require modification in any way?

3—Have they done anything to advance business?

4—Have they done anything to complicate matters?

5—Are they a saving of time or money to the wheel or truck manufacturer?

6—About what percentage of the steel bands for motor truck wheels made by you are in accordance with the S. A. E. standard dimensions?

While there are yet a few minor details of wheel dimensions to be considered, the committee's work is indorsed by manufacturers.

Mr. Kennedy also favored the branding of S. A. E. standard wheels. This would assure their being correctly proportioned and designed, although the materials and quality would not be passed upon.

The report of the broaches division which is up for the third time was read by C. W. Spicer. This report contains dimensions for broaches for square fittings, six-spline permanent fittings, six-spline sliding fittings, and taper fittings. There was no criticism adverse to the committee's report. In this, the action taken at the January meeting of the society caused the committee to consider only the six-spline, the four having been dropped until such time as there seems to be a definite demand for it from the society.

The report further recommends that the use of a taper of 1½ inches to the foot be adopted. As to threads for taper fittings, the S. A. E. standard is thought to be too coarse for broach work. It is the general opinion that for tapers having a nominal diameter from ⅝ to 1½ inches twenty threads per inch is the best size.

While the truck standards committee is not ready to present a report, progress was noted. Much research has been done and a table of truck dimensions made out on which sizes and dimensions of the various makes of trucks are entered. The N. A. A. M. truck committee, is also working on similar lines with the idea of standardization, and at a joint meeting of the S. A. E. division and the former, the work was shaped so that neither body would overlap the activities of the other. To this end the marketing phase was left to the N. A. A. M division, while the engineering questions were taken up by the S. A. E.

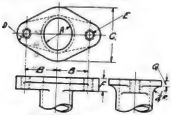
Ball Bearings Division Report

The report of the ball bearings division is merely a resubmission of certain data and tolerances to the society. There is no roller bearing data, since there are both spirally wound rollers and solid rollers and it seems impossible to arrive at any standard length which will cover all types. The length is not important so long as the bearing conforms to the outside and inside dimensions.

While the remainder of the reports of the divisions mentioned were voted to be submitted to the society as a whole for consideration, only seven of them were brought up before the convention for lack of time. These seven were those of the divisions on carbureter fittings, electric lighting, truck standards, wheel dimensions and fastenings for tires, broaches, data sheets and the magneto dimensions sub-division of the miscellaneous division.

In submitting the carbureter division's report it was brought out that the recommendations in it were submitted for final adoption, the work of the committee extending over a period of more than 3 years. In the absence of the chairman of the division, the report was read by J. J. Aull. In substance the report involves the elimination of 1⅛-inch and 1⅜-inch flange sizes. The recommendations which were adopted unanimously by the society to consider as recommended practice take into account the complete flange dimensions, the carbureter float chamber pipe sizes, the flared tube unions, the flared tube ells

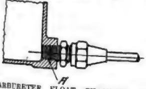
and tees and the throttle lever dimensions. Two sizes of rod ends were adopted, one a 3-16-inch end for carbureters from ¾-inch to 1-inch and the other a ¼-inch end for those up to 2 inches. The dimensions as now in force are here given in part:



CARBURETER FLANGES

Carbureter Size inch	A inch	B inch
¾	11/16	1 1/16
⅞	1 1/16	1 ⅛
1	1 3/16	1 3/16
1¼	1 [illegible]	1 11/32
1½	1 [illegible]	1 15/32
1¾	1 [illegible]	1 21/32
2	2 1/16	1 25/32

C inch	D inch	E inch	F inch	G inch
1⅝	11/32	5/16x18 U. S. S.	⅜	⅛
1⅞	11/32	5/16x18 U. S. S.	⅜	⅛
1⅞	11/32	5/16x18 U. S. S.	13/32	5/32
2¼	13/32	⅜x16 U. S. S.	15/32	3/16
2½	13/32	7/16x14 U. S. S.	15/32	3/16
2¾	15/32	7/16x14 U. S. S.	7/16	7/32
3⅛	15/32	7/16x14 U. S. S.	7/16	7/32

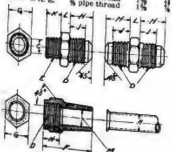


CARBURETER FLOAT CHAMBER PIPE SIZES

Carbureter Size inch	A Briggs Standard inch
¾	⅛ pipe thread
⅞	⅛ pipe thread
1	⅛ pipe thread
1¼	¼ pipe thread
1½	¼ pipe thread
1¾	¼ pipe thread
2	⅜ pipe thread

A inch	C inch
¼	3/16
5/16	7/32
⅜	9/32
7/16	5/16
½	13/32

D inch	E inch	F inch	G inch
7/16x20 S. A. E.	⅛ pipe thread	11/16	7/16
½x20 S. A. E.	⅛ pipe thread	1 1/16	½
⅝x18 S. A. E.	¼ pipe thread	1⅛	9/16
11/16x16 S. A. E.	¼ pipe thread	1¼	⅝
¾x16 S. A. E.	⅜ pipe thread	1⅜	¾

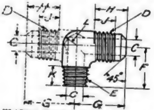


FLARED TUBE UNIONS

A inch	H inch	J inch	K inch	L inch	M inch	N inch
¼	½	11/32	⅜	3/16	.225-.257	11/32
5/16	9/16	⅜	⅜	7/32	.317-.319	⅜
⅜	⅝	13/32	7/16	¼	.380-.382	7/16
7/16	11/16	7/16	7/16	9/32	.442-.444	7/16
½	¾	½	½	5/16	.506-.507	½

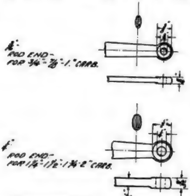
A=Diameter of Tube

A Diameter of tube inch	C Diameter of drill inch	D inch	E Briggs Standard inch
¼	3/16	7/16x20 S. A. E.	⅛ pipe thread
5/16	7/32	½x20 S. A. E.	⅛ pipe thread
⅜	9/32	⅝x18 S. A. E.	¼ pipe thread
7/16	5/16	11/16x16 S. A. E.	¼ pipe thread
½	13/32	¾x16 S. A. E.	⅜ pipe thread



FLARED TUBE ELLS AND TEES

A inch	F inch	G inch	H inch	J inch	K inch	L inch
¼	⅝	¾	½	11/32	⅜	⅛
5/16	11/16	13/16	9/16	⅜	⅜	¼
⅜	⅞	1	⅝	13/32	7/16	9/32
7/16	15/16	1⅛	11/16	7/16	7/16	5/16
½	1	1 3/16	¾	½	½	11/32



CARBURETER THROTTLE LEVERS

The report of the lighting division which advocated the adoption as standard practice of the Ediswan type of sockets for electric lights and the using of 4-candlepower electric sidelights and rear lights and of 20-candlepower headlights was read before the society by Mr. Souther in the absence of Mr. Churchward, and it was unanimously adopted.

Data Sheet Division Report

The data sheet division stated that it had its matter well in hand, and asked that manufacturers who make sheets to fit the S. A. E. handbook first submit the proofs to the division before sending them out, so that they can be inspected and passed upon. It also was suggested that as little advertising be placed upon them as possible so that the work of the committee will be lessened, as this superfluous matter must usually be eliminated. Suggestions as to the accumulation of useful data from the technical press and technical schools for incorporation into S. A. E. data were made.

A report presented by F. E. Moskovics covering the minutes of a meeting of a special advisory committee of the society on magneto standardization held at the Claypool hotel in Indianapolis on May 31 was referred to the standardization committee for action such as it sees fit. This committee of magneto men was composed of F. E. Moskovics, chairman; P. A. Wiley of the Kokomo Electric Co., I. J. Reuter of the Remy Electric Co., V. Kliesrath of the Bosch Magneto Co., W. J. Hart of the Splitdorf Electrical Co. and J. O. Heinze of the Heinze Electric Co.

CHARLES E. DURYEA

A standard taper for four and six-cylinder magnetos was recommended by this committee, its length to be .5905 inches, the large diameter of shaft to be .5905 inches, the small diameter .472 inches and the angle of the taper 5 degrees and 45 minutes. The length of thread for the end of the shaft was recommended to be .5905 inches, while the thread should be ⅜, 16-thread, U. S. F. As to base height the committee recommended a dimension of 1.771 inch from the center of the shaft to the base. This figure is equivalent to 45 milimeters. Other recommendations were that for the two-magneto machines the distance from the first bolt hole to the large end of the shaft taper should be 2.086 inches; the size of the hole on a two-magneto machine should be ⅜, 16 threads, U. S. F., 1,9685 inches or 50 millimeters a sheer clearance of 8 inches from the base to the top of magneto space, a width of 5 inches and an overall length of 10 inches should be allowed by motor designers; advance lever should have a radius of 2⅛ inches from the center of the armature shaft; and that this hole should be drilled to take a tapping hole of ¼, 28 p. thread.

Motor Truck Sizes and Drive Ratios

The paper by E. P. Batzell on the subject of "Motor Sizes and Drive Ratios for Commercial Vehicles," which was read by its author, was agreed to be one of the most comprehensive and valuable matters submitted at the session. The discussion which it called forth was also very interesting and instructive, some of the best informed members joining in the talk. The subject is a live one, and one with

which more than one of the members is well informed. The subject of Mr. Batzell's paper is given in part as follows:

The question of the selection of motor sizes for commercial vehicles has not been discussed much or often. It may be discussed as to several different basic conditions. In this paper it will be taken up principally from the standpoint of general economy, this being presumably most vital in successful commercial car service. Under "general economy" there are not only economy in consumption of fuel and oil, but also economy in the initial cost of the motor and its whole upkeep expense. At first the consumption of fuel only will be investigated, as to its variation according to different motor sizes for the same work. By assuming equal working conditions whenever comparison is being drawn, one need not keep track of the total fuel consumption in every case, but of merely the consumption per developed unit of work.

The abnormally great variation of present truck motor sizes is obvious. Taking the motor sizes of trucks of equal hauling capacity, as shown this year at the principal motor shows, one will find in the case of 1-ton trucks the piston displacement varying from 144 to 350 cubic inches, and in the case of 3-ton trucks from 230 to 570 cubic inches. Figuring the above volumes at an equal piston speed of about 800 feet per minute, the respective variations become: total piston displacement per minute of 1-ton truck motors from 100 to 178 cubic feet, and of 3-ton truck motors, from 185 to 264 cubic feet. Taking into consideration the difference of the weight of the vehicles proper together with their rated load, the picton displacement per pound of this weight in the case of the 1-ton truck varies from 40 up to 61 cubic inches and in the case of the 3-ton truck from 21 to 38 cubic inches per minute.

Power Depends on Charge

The power developed per unit of piston displacement depends on the charge taken into the cylinder, the compression ratio, the heat losses, the carburetion and gas mixture consistency, ignition, timing and a few other things. The present discussion refers only to common four-cycle engines. The compression space in truck motors is frequently 28 to 30 per cent of the total cylinder volume, as against 20 to 23 per cent and sometimes less in pleasure cars. Inasmuch as high compression motors develop at medium speed relatively more power than low compression motors, the difference in truck motor sizes can be explained in part by the difference of compression used. A variation of motor size within 5 to 10 per cent of the piston displacement can be thus explained.

In certain cases it happens that a manufacturer uses a pleasure car type motor for trucks, either because the same motor is used also in his pleasure cars or because he is able to secure the motors on otherwise profitable terms. Putting pleasure car motors into trucks explains further why truck motor sizes vary so much. A comparatively small pleasure car engine is apt to have enough power for commercial car purposes in certain cases where otherwise a larger motor would be advisable; the high compression of the former assisting somewhat in power development. Such an engine if kept working at comparatively slow piston speed may hold out well and also prove sufficiently economical in fuel consumption, because it has a higher thermal efficiency than the low compression motor, providing it has a good volumetric efficiency. On the other hand, when an oversized pleasure car engine is used for a truck of comparatively small carrying capacity, the engine will have an abundance of power for even any extreme case of requirement during service, but most of the time it will be developing only a small part of its power capacity. Consequently this engine will work with very little cylinder filling by fresh charge, with small throttle opening, and the thermal efficiency will be low, as well as the mechanical efficiency, because the amount of power lost in the mechanism of the engine proper will be large as compared with the amount of power generated by the motor. Moreover, the initial cost of oversize motors is considerable, and they weigh more and take more space than motors of rational size and power for a given purpose.

It has been already stated that relatively high compression raises the thermal efficiency. On the other hand, it means higher pressures throughout the moving parts of the engine, and consequently the losses due to friction in them become greater also. Moreover, at slow speed the heat losses through the cylinder wall, especially through that surrounding the combustion chamber, are greater with high engine compression than with low, notwithstanding the larger area exposed to cooling in the latter. In some instances these losses may more than offset the gain in the thermal elapsing of the engine cycle. At any rate, they limit the compression ratio, which is economical for commercial car purposes.

BEFORE MARQUETTE MONUMENT AT MACKINAC

HOWARD MARMON

The volume of cylinder filling by fresh charge during one cycle period is closely interconnected with the engine's pressure diagram, it being supposed that the engine has reached the stationary state of its thermal balance, viz., its cycle heat exchange. The cylinder filling is likewise interconnected with the developed motor power and torque, the latter being equal to the mean diagram pressure, times the piston area, times the crank radius, times the mechanical efficiency of the motor. In most well-proportioned automobile motors the maximum torque is developed at very slow speed, the slowest at which the motor will run under full load.

Carbureter Conditions

When considering the cylinder filling purely theoretically, as the result of filling a compartment under influence of a pressure difference created by the suction action of a piston, the greatest volumetric filling corresponds to the lowest recorded motor speed. However, if a true reproduction of the motor performance is desired, certain practical points which might alter the former theoretical result must be introduced. One must separate the meaning of actual volumetric cylinder filling, which refers only to volume, from the "best" cylinder filling, as mentioned in this article. The second meaning is intended to denote not only the volume of gas freshly taken into a cylinder during the inlet period, but also this volume adjusted according to the state of the air and gasoline mixture in regard to the capacity of power development by this latter. Although the greatest measurable volume of air and gas would be drawn into a cylinder at the lowest speed, the conditions of the air, of the gasoline, of the carbureter adjustments, etc., may be such that the most effective mixture consistency, considered from the point of power development per unit of volume, would appear at a somewhat higher revolution per minute.

Within practical limits the coefficient of friction generally decreases as the motor runs faster. Another item to be included in the mechanical motor losses is represented by the power required for driving the air fan, the oil and water pumps, the magneto, etc., which always increases with the motor speed. Whether the resulting percentage of total mechanical losses in a motor will increase, remain constant or decrease with the gain of speed depends on the relation between the above-named kinds of power losses. Were it possible for a motor to retain a constant pressure diagram area through a range of speeds, the respective torque curve would gradually drop or rise according to whether the mechanical efficiency dropped or rose.

Thermal Efficiency

Some conditions affecting the thermal efficiency and the respective maximum do not remain unchanged throughout the whole service. Thus deposits of carbon inside the cylinder render its cooling more difficult, reducing the heat conductivity of the walls. Such a state of the motor transforms its action into one similar to that in constructions with small cooling surfaces. Therefore the maximum of its thermal efficiency corresponds to lower revolutions per minute. The same result will be detected in motors of which the exhaust passages, exhaust pipe and muffler have become clogged with sediment of the escaping gases. This will naturally cause a higher back pressure during the exhaust stroke, which will increase the quantity of spent gases remaining in the combustion chamber, offsetting the decrease of heat losses earlier by impairing the quality of the charge. The temperature of the air, the grade of fuel, the carbureter system, conditions of the ignition, etc., may influence the thermal efficiency. Therefore the foregoing discussion in regard to the latter, as being governed by the heat losses and the volumetric filling, remains true with different constructions only when all items enter into the matter evenly. However, this should not change the statement made before, that most often the maximum of the thermal efficiency will be located at considerably higher revolutions per minute than the maximum of the motor torque. It follows that the moment of most economical motor speed with the least fuel consumption per horsepower lies somewhere between these two maxima, and where the influence of the decreasing torque development is compensated by the rising thermal efficiency. Speaking graphically, the point of minimum fuel consumption will correspond to the revolutions per minute the intersections of which ordinate with the torque and efficiency curves represent the touching points to them of such straight

FIG. A. REFERRED TO BY MR. BATZELL

VIEW OF MACKINAC ISLAND AND THE STEAMER

lines, which both have equal angles with the coördinates, but of reversed denomination—one angle is positive when the other is negative, Fig. A. Of course, the scale units for the torque and efficiency curves must be properly selected if a graphical method of finding the minimum of fuel consumption from the above description shall give correct results.

All the foregoing in connection with the torque, the efficiency and the fuel consumption is based chiefly on logical considerations. Sometimes the results of actual tests may differ from the conclusions arrived at herein. The writer regrets that lack of available test data necessitated the employment of curves at will in some places in this article. It would be greatly appreciated to receive reliable results of actual tests by means of which one could verify some of the assumptions made. The test of the Franklin engine referred to gives one of the most complete sets of published test results, a number of which check well with the above derived statements and some of which do not. In regard to this latter fact one can say that the tests in general revealed somewhat peculiar conditions of engine action seldom met in practice.

Should other conditions involving motor economy be equal it is preferable to have the moment of least fuel consumption located on the rapidly dropping part of the torque curve. This latter must not have a rising direction at low speed, which would be particularly undesirable in case the torque maximum is close to the revolutions per minute of minimum fuel consumption. In other words, one would lose part of the advantage of less speed ratios by extending the allowable limit of economical revolutions per minute because this extension toward the low speed, when passing the moment of maximum torque, ceases to assist the increase of the factor f. The aim to increase this factor is the only reason for extending the economical speed limits on account of the consequent simplification in the speed-changing mechanism, as explained. The reduced cost of the simpler construction is to offset the somewhat larger expense for fuel.

After certain revolutions per minute are exceeded the rate of motor torque drop increases rapidly. It would seem desirable to reach the minimum of fuel consumption at higher motor speed, so as to bring it into the zone of rapidly falling torque. The relation between fuel economy and motor torque and efficiency is such that the minimum of the first can be brought into the rapidly dropping part of the second only through proper co-influence of the last. To make the fuel economy not only relatively, but actually best during the decreasing torque it is essential that the thermal efficiency increase very suddenly at this moment, so that its rate of increase will offset the influence of the diminishing torque development upon the fuel consumption. A similar sudden rise of the thermal efficiency is hardly to be anticipated in a correctly designed and built engine, because the items affecting it elapse more or less gradually without any great changes in the rate of their influence. Of course one could make use of certain means to further artificially the quickness of thermal efficiency rise during the desired time, but this could be done only at a sacrifice of the efficiency at other speeds, and moreover with a chance of lowering its absolute value generally, throughout the whole range of motor speed. It would obviously make the conditions of fuel economy worse instead of better. Therefore, it is preferable to maintain such a motor construction as will permit the maximum thermal efficiency and also the best fuel economy during medium high revolutions per minute, and also not prevent the attainment of their highest values obtainable in practice.

F. H. FLOYD

Rate of Power Development

The rapidity of the motor torque drop indicates the rate of power development; for instance, when the torque falls quickly in value, the power curve shows a sharp declination from the initial straight direction. This means that the motor receives a smaller and rapidly decreasing amount of fresh charge, and works with a lower mean effective pressure than at the lower revolutions per minute. In other words, the motor becomes more strangled in valves and gas passages, which most frequently is accompanied by reduced mechanical efficiency.

Keeping the vehicle speed in accordance with any of the above-mentioned possibilities serves as a means for setting the rate limit of throttle closing, with the use of a prescribed drive ratio.

It is doubtless most profitable to use in a commercial car the smallest motor, the developed torque of which at the most economical revolutions per minute, with a suitable ratio in the drive, is sufficient to propel the vehicle. The motor size thus can be determined from different working conditions, assuming any of the prospective load and tractive resistance as basic in the figuring. The motor should be small enough to render reliable service when the run of the empty vehicle covers good, level roads and the desired speed is obtained with the highest ratio in the drive, whereby the motor itself remains within the prescribed economical limits of speed and throttle-opening. On the other hand, this same motor must be sufficiently strong to propel the loaded vehicle under average road conditions as expected in service and maintain the speed found the most advantageous. If these conditions are the ones most frequently to be encountered, then at the same time the motor should work with throttle full-open and also within its set speed limits, although the drive ratio might be different from the one used for the empty runs, this being determined principally in accordance with the desired vehicle speed and the revolutions per minute of the motor. Any increase above a certain limit of the tractive resistance, due to changes in the load, the road, etc., will be taken care of by introducing a greater ratio in the drive, retaining the economical motor speed and torque. The greatest ratio necessary ought to be sufficient to make the vehicle negotiate at a given slow speed the worst kind of roads to be met in service upon grades and with a considerable load. As stated before, the condition to be considered in determining the lowest speed ratio in the drive and the motor power in connection therewith should include the cost of the service versus time required to perform it with the respective motors and drive ratios.

Regardless of the method followed in establishing the motor size, the smallest one would obviously be the most economical from many other points of view than that of fuel consumption. The smaller motor uses less lubricating oil, is less expensive in initial cost, its repairs are likely to be handled more easily and cheaply, it allows reduction of the vehicle size and weight (together with a number of advantages connected therewith), some of the other vehicle parts can be decreased in size, etc. The smaller and lighter motor permits either reducing the overall dimensions of the vehicle for a given carrying capacity, or leaving more available room in the same space, and greatly increases ease of arranging the whole vehicle construction, especially in the generally crowded space occupied by the power plant.

It is to be noticed that the foregoing discussion deals with the question of required most economical motor size without consideration of the power consumed when accelerating the vehicle. It would be entirely wrong to base judgment as to essential motor size on an assumed rapidity and ease of get-away. A buyer can be influenced easily by a demonstration when a loaded truck is starting under way from standstill with second or higher gear in mesh, although in reality ability to do this indicates merely uneconomical action during average service conditions. Starting, as well as the propelling of a vehicle, imposes certain requirements on the motor torque, not its power. The favorable shape of a motor torque curve has been explained, dropping gradually from the lowest revolutions per minute on. This gives a double advantage in starting the car with the motor running comparatively slowly. On the other hand, it is often profitable to use flywheel inertia to assist in making the start or overcoming some other increased resistance of short duration.

Avoid Oversize Motor

Quick acceleration in congested traffic is more important in a pleasure than in a commercial car; it causes some overwork of the motor and adds severe requirements of efficiency of the general brake system, which ought to cause a stop at least as quick as the time of acceleration; otherwise a heavy vehicle with a great momentum gained by acceleration brings very undesirable conditions into traffic. It is proper to run a heavy truck with low gear in mesh in a tight place, when a comparatively small motor will develop sufficient torque and power to keep the vehicle within reasonable limits of acceleration without disturbing the general traffic order.

As stated before, it has appeared safe to use an oversize motor in a truck; thus one did away with possible future criticism as to lack of power. With increasing attention being paid to economical performance in service, which ought to influence the scope and extension of commercial car application, the matter of properly selecting motor sizes according to service conditions rises in importance. It can cause not only a general revision of truck motor sizes, but introduce a greater variety of motor sizes for cars of the same capacity, of the same make, whereby different motors will be selected in accordance with prospective service. Thus one may become gradually educated to the fact that the use of a four-cycle, four-cylinder, 4¾ by 6 inch motor in a 3-ton truck, regardless of the prospective service, means at the least a serious disregard of economy. A buyer of commercial cars will do well to look into this side of the question to assure himself that the extra expense connected with the oversize motor remain within allowable limits. The proper solution of the question requires considerable experience and ability. Nevertheless, introducing principles of "scientific management" into the matter of purchasing commercial cars is justified, not restricting their application to the organization and management. In this connection it may be mentioned that although this article deals with the question of motor size only, a similar investigation could be made of the other parts and constructive features of the vehicle.

G. M. Myers, in opening the discussion upon the subject, said that the views as expressed in the paper should be known and understood by truck designers. In many cases, he said, truck motors are converted pleasure car types, and this type is not called upon to deliver its maximum torque. The truck is therefore burdened with a motor weight which is largely a dead weight. In regard to truck speeds, he stated that 13 miles an hour is entirely feasible under certain conditions. However, on American roads and with the average truck driver, such speeds are not desirable.

Views of D. Fergusson

Mr. Ferguson thought that the question was largely a determination of the relation of the size of the motor to the work to be done. The motor should be made as small as possible to do the work. It is an easy matter to determine the correct gear ratio for a set of given conditions, and for a given work. The motor should always be well within its capacity and should not be worked to full load, but to only about 75 percent. If a truck engine is worked to its full capacity, it has a short life. For a 5-ton truck, he gave it as his opinion that a four-cylinder motor having dimensions of 4⅞ by 6 inches is about the correct size. In designing a truck, after the ratio of the tractive effort to the weight of the vehicle under load is determined once and for all successfully, it is a simple matter to make all other sized vehicles correct proportionately. It is a big mistake to underpower a truck, he added.

In the opinion of Mr. Bachman the 3,000-pound car outlined in the Batzell paper offers a basis for valuable lines of thought. Tests which he has conducted incline him to believe the statements of both Mr. Batzell and Mr. Fergusson. For economy, he stated that it is first best to know the loads to be carried and the territory of operation, after which a motor and transmission to suit these conditions may be obtained.

To lengthen the truck's life, Mr. Guilder believes that the speed must be kept down and the power must be ample.

Mr. Duryea, when called upon to give his opinion, stated that his experiences had only been with trucks of the lightest type. He believes in keeping the speed low. The design of a motor to get high torque at low speeds, say from 600 to 800 revolutions per minute, is analogous to the draft horse and the race horse. The former gets down and pulls while the latter is meant only for speed. The truck motor must get down in the mud and pull in much the same way.

Mr. Perrin believes that the speed of a truck is dependent and is limited by the tires.

Mr. Batzell declared that he agrees with the Batzell paper and most of the previous speakers. He believes in an engine with small bore for economy. He also stated that the speed depends upon what the owner is willing to pay for tires. He thought that for a 3-ton truck a motor of dimensions of 3¾ by 5½ or 6 inches was about right. For American roads he advocated the speeds for trucks as set down by the N. A. A. M.

In Mr. Coffin's opinion, the foundation of the matter is not in the motor dimensions but in the piston speed. The friction of cast iron against cast iron is now the known consideration, and the piston speed should be relatively low.

Mr. Souther stated that one phase is the weight of the truck motor as compared with that of the pleasure car motor. The truck motor must run more hours and must have more torque than the other type. He advises that the parts be made heavier and better if anything than those of the pleasure car. He also believes in relatively low piston speeds.

In England, Mr. Brewere stated, the design of truck motors was started too light, and they have gained considerably by modifying the early designs. He stated that it is best to give to the truck motor the highest possible compression when it is new to make up for its losses later when it has worn somewhat. In regard to speeds for trucks, he said that in England a speed of 20 miles an hour was looked upon as about right for the average truck motor with a 4-inch bore.

Chase on Motor Testing

The two papers dealing with motor testing, namely, the report of a comprehensive motor test by Herbert Chase and the subject of "Standardization and Cooperation in Motor Testing," by H. L. Connell, brought forth a valuable discussion from the members. The suggestions embodied in the latter paper as to the making of uniform codes for motor testing was most favorably looked upon by all, the engineers agreeing that such codes are much needed in order to be able to compare motors which have been subjected to tests.

Mr. Chase's paper dealt with a most elaborate test upon a Pierce-Arrow motor which extended over a period of 3 weeks and which was conducted in the testing laboratory of the Automobile Club of America in New York city. A number of points of value to engineers were established by the test. It was shown that at high speeds the motor developed a back pressure of nearly 8 pounds per square inch. A surprisingly low thermal efficiency was obtained, the maximum with muffler on and throttle wide open being 17.8 per cent. The substance of the paper is given:

Substance of Chase Paper

In making this test it has been the purpose of the writer to investigate several sets of phenomena which are not frequently taken into consideration in making a test of an motor car engine. If the results obtained lead to the establishment of certain laws which will aid the engineer in improving upon present practice in design, we shall feel that we have been well repaid for our labors. We hope also that the methods followed in securing the results given herein may prove of value to other investigators.

Particular emphasis was laid upon ascertaining the following:

(a) Volumetric efficiency of motor.

(b) Ratio of air to gas consumed.

(c) Loss of heat to water jackets.

(d) Temperature and constituents of the exhaust gases.

(e) Effect of the back-pressure in the exhaust pipe on the power and volumetric efficiency of the motor.

(f) Amount of power required to drive the motor idle under various conditions.

Incidental to these determinations were several others which are interesting and decidedly important in themselves, but many of which are, or should be, a part of every thorough test.

The six-cylinder Pierce-Arrow, 48 horsepower (manufacturer's rating), 1911 model, motor used in these tests is a good example of the T-head poppet valve type. Only a brief description of the motor will be given here since the design is one very familiar to most motor engineers.

The cylinders are of 4½-inch bore and the stroke is 5½ inches. Both inlet and exhaust valves are 2⅝ inches outside diameter, the opening in the seat being 2¼ inches in diameter and the lift 11/32 inch.

The motor was put in perfect condition prior to the tests and every precaution was taken to prevent the occurrence of variables which might tend to confuse the results. It was found that the power which the motor developed under identical conditions was practically the same at the end as it was at the beginning of the tests which covered a period of some three weeks.

Ignition was furnished by a Bosch high-tension magneto which was set to fire the charge at a point on the piston stroke ⅝ inch before top center when the timing lever was at the full advance position.

The carbureter used on the motor was selected because of the consistently dependable results which it was known to give and because of its ability to supply at all speeds a mixture which invariably produced steady running.

HOWARD COFFIN GREETING HIS GUESTS

Before the first test the carbureter was properly adjusted and this initial setting was not altered through the series of tests.

The following method was adhered to in taking readings: The throttle was opened to the desired position and the spark set for each run at its "best" point within the limits of the advance mechanism, that is, the point of maximum power. This point was determined by the use of the wattmeter which indicates the output of the dynamometer. When the power input is a maximum this instrument gives its maximum reading for the particular conditions existing, hence, it serves a most convenient purpose and makes it unnecessary to take both torque and speed readings and multiply these together to determine the power developed during the time when the proper adjustment is being made.

The mechanical efficiency of a high-speed automobile engine is very difficult to determine with any great degree of precision, owing to the fact that no high-speed indicator has yet been devised (at least so far as the writer is aware) which can be relied upon to give accurately the indicated horsepower. Some cards were obtained with a Hospitalier - Carpentier manograph. These cards are useful only for comparative purposes, and even accurate comparisons are difficult to make in all particulars because of the fact that the card given during one cycle may be quite different from that of the following or some succeeding cycle, although the conditions obtaining outside the cylinder are apparently very constant.

The curves which have been plotted from the results of these tests show in graphic form much more clearly than words can the relation which exists between the variables considered. Some points, however, are worthy of special comment, among others the following:

Charged to Back Pressure

The loss of torque, and consequently power, at high speeds, due to excessive back-pressure in the exhaust connections is a matter which may well receive more attention than it has heretofore been given by engineers. The muffler used in this test is the one regularly applied to this motor under service conditions. It is of a type formed from cup-shaped stampings slightly telescoped at the ends. The bottoms of the cups form baffle plates which are pierced with holes of varying sizes and having different relative positions in adjacent sections, thereby compelling the gases to turn a great number of corners while escaping. The result is a back-pressure amounting to nearly 8 pounds per square inch at high speeds.

More attention might well be paid to the development or proper selection of a muffler which will be silent without giving undue back-pressure. Nearly every muffler manufacturer claims these qualities for his product, but it is apparent that some at least cannot make their claims good. When a proper muffler is used there would seem to be little excuse for a cutout and there is certainly no excuse for using the latter in city traffic (even when the back-pressure is higher than need be); for the curves referred to show only an insignificant difference in power with the throttle wide open at speeds lower than 1,000 revolutions per minute, and no careful driver will run his motor wide open at this speed within city limits unless the grades to be negotiated are far greater than normal.

The problem of properly carburetting a six-cylinder motor is always a difficult one. The writer is of the opinion, however, that the problem would be much more easily solved if the disturbing factors resulting from exhaust back-pressure were removed. Not only does high back-pressure require the doing of unnecessary negative work, but it also leaves a greater weight of exhaust gases in the clearance space and thereby dilutes the incoming charge more than is necessary. With this dilution the tendency toward irregular running is increased and both the thermal and volumetric efficiencies are decreased.

Generally speaking, the per cent of total heat supplied absorbed by the jacket-water was about double that absorbed in useful work at speeds below 600 revolutions per minute. At the speeds of maximum thermal efficiency with wide throttle-opening, the per cent of heat absorbed by the jackets was about one and a half times that absorbed in useful work, and at higher speeds the comparative loss was about the same.

Volumetric Efficiency Considered

For the purpose of this test the author has considered the volumetric efficiency of the motor to be "the ratio of the volume of air passing into the motor in unit time, under test conditions, to the volume swept out by the pistons (i. e., piston displacement) in the same time."

The thermal efficiency of the motor with wide open throttle was a maximum in all cases between 1,100 and 1,400 revolutions per minute. It was nearly the same as between runs, with muffler and without muffler, up to 1,100 revolutions per minute. Above this point, however, the efficiency dropped off in the former case but increased when the muffler was removed up to a speed of about 1,400 revolutions per minute.

The maximum thermal efficiency (with muffler on) was 17.8 per cent with throttle wide open, 15.1 per cent with throttle one-third open and 6.2 per cent with throttle one-sixth open.

The exhaust gas from the motor was found to consist, aside from nitrogen, entirely of CO_2, CO, O_2. No heavy hydrocarbons and no methane or hydrogen were found in any sample. It appears to be impossible from the analyses given herewith to draw any conclusion as to the proportion of the three constituents (aside from nitrogen) which will result under a given set of conditions. Just why this is true is not entirely clear, but it seems probable that somewhat more intelligible results would be secured if a different method of collecting samples of the exhaust gas were followed. The manograph shows very clearly that the combustion within the cylinder is seldom the same in two succeeding cycles. Hence, the gases expelled are not likely to have the same composition. It is, therefore, not certain that a representative sample of gas is collected by the method followed in these tests. It is the purpose of the writer to experiment further along these lines and to secure a more representative sample by collecting a much larger volume of exhaust gas and mixing the latter thoroughly before taking a sample for analysis.

From the analyses here given, however, certain facts are apparent which are not perhaps generally appreciated. Among these may be cited the following: First, that the combustion was not perfect in any run, i. e., there was always some CO present, and in some cases the proportion was almost as great as the CO_2; second, that there was in most cases a trace of free oxygen and in many cases as much as 2 or 3 per cent of the latter existing side by side with CO. This proves beyond question that the mixture within the cylinder was never absolutely homogeneous. Apparently some molecules of oxygen never come into contact with molecules of CO until the temperature is reduced to such a degree that combustion of the latter does not take place.

The ratio of air to gas when plotted against speed gives a curve which appears to follow a fairly well defined law. In any case the characteristics are similar in all the wide open throttle runs, and the variation is not so great as was anticipated. In the wide open throttle runs it varied from 12.2 to 14.2 and in the part throttle runs from 10 to 13.5.

In conclusion the writer wishes to say that he will be gratified if this paper draws forth many questions and a wide discussion of the subject in hand. If there have been omissions of data which should have been included an effort will be made to supply these particulars before the paper is printed in its final form. Furthermore, if the results here given suggest to any member the possibility of amplification in the nature of research work the results of which will be of real value to the society, such suggestions will be welcomed and given careful consideration.

In outlining and suggesting methods for co-operation and standardization in motor testing Mr. Connell touched upon the existing methods of testing, which vary widely, almost every laboratory having its individual methods which do not correspond with those of any other. For this reason it is next to impossible to arrive at comparative results. A code which all could follow would largely clear up this confusion, as he explained. It was suggested that governmental co-operation in the matter be also sought as well as that of the members of the society. The salient features of the paper follow:

In doing college laboratory work, and later carrying on an extensive number of tests in the experimental motor room of one of the best known companies, I became impressed with the great lack of uniformity in methods and the uncertainty of comparisons of published data on this account. The suggestion presented itself that the Society of Automobile Engineers could very properly and profitably take up the subject of gasoline motor and allied tests in a manner that would remedy the present conditions.

This work could be developed along several lines. However, the great present need is for uniformity in the carrying on of each class of tests and in the reporting of the same. As conditions are now, there is such a divergence of methods that even the most carefully developed tests are only of value for their individual conclusions and it is almost impossible to link them with other tests for the purpose of drawing conclusions from a broader point of view or for direct comparison. The same condition existed at one time in the field of steam engineering. To meet this, the American Society of Mechanical Engineers developed their codes of boiler and power plant tests. These codes have been revised at intervals as conditions and continued study dictated, and have been held as practically absolute and universal standards. Tests carried on under them give engineers an opportunity to pick out relative values, for there is the assurance that the results are really comparable. The buyer bases his specifications and conditions of acceptance upon these standard tests. Although the time has not yet come when the purchaser of a gasoline motor is given or demands standard tests and characteristic curves, yet that time may not be so very far off. A study of past and present announcements shows a tendency to this. At first there were the exaggerated claims of power which the public soon learned to discredit; then came the general rating by the very arbitrary A. L. A. M. formula, and now we notice numerous statements of the formula rating followed by "actual brake test" readings. The advantage of the old formula method was that it dealt with definite denominations only, and there could be no question as to the methods used behind the mysteriously locked doors of the experimental room. The inadequacy of the A. L. A. M. horsepower rating is well known, but some of those who are stating brake horsepower have based their claims on very low averages, doubtless for fear of reviving the old distrust of such ratings. This state of affairs is obviously unfair to all concerned, but until tests can be conducted in accordance with a code that is universally known to be standard, and to give comparative results, the conservative can hardly follow any other course.

There are other possibilities open to a committee on motor testing after a code has been developed and while developing it. One of these is to act as an advisory board in broadly mapping out lines of investigation. This would apply especially in relation to the work being done at the leading technical schools in this country. Here we have well equipped laboratories and well trained men, but it is surprising to know the difficulty advanced engineering students have in settling upon a line of research. The difficulty of picking a partic-

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ular field is not so great, but to know where to begin and how to get somewhere in the allotted time is the sticking point.

There are problems of a general nature and of considerable importance which have had to wait while those of more momentary interest were disposed of. Some of these investigations have lapsed because no laboratory of a manufacturer could give the time to carry them through. With coöperation between the technical, commercial and private laboratories a committee should be able to direct the course of a general investigation so as to make it produce definite results and be of a great deal of benefit.

At its last meeting the Detroit section of the S. A. E. passed a resolution to inquire into the availability of the United States Bureau of Standards for carrying on certain tests of a highly technical nature. This was a definite expression that there is need for work that cannot well be carried on at the motor car factory. It also suggests the possibility of including the government departments in the plan of coöperation.

There are two further advantages that would arise if the S. A. E. took an official or semi-official interest in the technical schools. The first is in the matter of equipment. Manufacturers are constantly being requested to loan or donate motors and other modern equipment to the school laboratories. This is often at the request of some particular student, and when he has completed his course the investigation is not continued. Under the new plan the donor would have far greater assurance that the tests on the apparatus would be carried to the end intended and that a real benefit would result from his generosity. The second benefit would be the training gotten by the young men doing the work, for this would particularly prepare them for the motor industry.

After the reading of the two papers they were laid open for discussion, Mr. Brewer being requested to begin it. In carrying out the tests, he said that in some instances Mr. Chase has taken infinite pains, but not enough trouble in others. The method of measuring the air supply is good, but it is too exhaustive. On the other hand, no consideration at all was taken of the fuel supply, which has a greater bearing on the results. He stated that the metering pin of the carbureter used is difficult of adjustment due to depressions in the air pipe above and below the nozzle. With this type of carbureter, the coefficient of discharge through the orifice from .05 to .07. The result is that the fuel consumption is high and the power low. In discussing the indicator cards obtained Mr. Brewer stated that they are too thick in the middle, perhaps due to the mixture. In a thermal test the object is to eliminate CO and free O as far as possible. The ratio of the weight of the air to the fuel was not great enough. The ratio used was 13 per cent by weight, whereas an 18 per cent ratio is better. The heat loss to the jacket depends largely on the shape of the combustion chamber, which is at variance with statements in the report.

Few Conforming to Code

Mr. Souther stated that he is particularly keen about the subject expounded in the Connell paper. In his journeys about the country and visits to various laboratories the lack of uniformity is very noticeable. There is much divergence in methods of procedure, some being altogether too elaborate and some too meager. There are many operators who are not conforming to any code whatever. He advocated the forming of a code committee as a further division of the standards committee. It is important to have co-operation with the technical schools, he said, as they are only waiting for directions as to how to proceed. If the students are properly educated as to testing methods, they will come to the engineering fraternity better prepared to become valuable members later on.

Mr. Birdsall stated that his only experiences with motor testing of recent years were with respect to a rotary valve motor, more details of which he would vouchsafe at the January meeting.

When asked to say something in this regard, Mr. Pope stated that the subject had already been well covered, but he believes that great progress will be made if some standard method of motor testing is devised.

Heinze Cites Some Examples

In response to Mr. Brewer's remarks as to the influence of carbureters and fuel mixtures on tests, J. O. Heinze cited some experiences which he has had with carbureter adjusting. With different types of intake manifolds, he arrived at different results. If the matter of the carbureter adjustment were all there was to consider, as Mr. Brewer stated, the results of Mr. Heinze's tests would not have varied so widely. In place of the manifold tube between the carbureter and that point of the manifold where the separate branches lead to the different cylinders, he substituted a piece of glass tubing of the same size so that he could observe what was taking place. At low engine speeds, the mixture in passing from the carbureter would get fogged for a few inches, then it would clear itself in passing on to the manifold branches. At higher speeds this fog appeared for a longer length of the tube. Mr. Heinze therefore decided that a time factor is necessary in order for the gas and air to thoroughly mix. He further decided that it is best to use a long intake for high speed engines and a short one for low. To be theoretically correct, therefore, the manifold length should vary with the speed of the motor. This is manifestly impossible, but the next best thing to do is to make the manifold length depend upon the piston speed at which the best operation is obtained. It was a question, Mr. Heinze went on to say, just how much of Mr. Chase's paper can be used by the industry. Block tests are not of the greatest value since the conditions under which they are taken are not the same as road conditions. The lack of uniformity in tests is also disparaging and detracts from the paper's usefulness. Whatever is done in the matter of testing, those in charge should be sure of their premises. It is easy to introduce unknown errors. Results usually vary with conditions imposed and the degree of perfection of the apparatus.

In answer to Mr. Heinze, Mr. Brewer stated that modern practice in England gives a fairly large space for the outflow of gases from the carbureter, which space is hot-water jacketed. It is largely a matter of critical length, rather than of actual length.

The engine given for the tests was a standard 1911 model of the Pierce-Arrow type, Mr. Fergusson said. The friction losses which are given in the report will soon disappear, after the motor has run awhile, he said. He believes that the operation of the motor was changed due to the use of a carbureter other than the Pierce carbureter for which the motor was designed. He can not understand why such a large back pressure was found, since on his own tests conducted with the same type of motor he obtained very little.

C. L. Scheppy, also of the Pierce-Arrow company, stated that the performance was altered by the use of another carbureter. He thought that it would have been better and fairer to the motor if its worn carbureter had been used.

The curves or cards supplementing the report are governed somewhat, Mr. Hemple said, by the size and length of the manograph tube. He stated that manograph results are purely comparative and not absolute. For this reason he would not credit any results obtained with the instrument at speeds over 800 revolutions per minute. He thinks that in an experimental department of ordinary type it would be impossible to conduct so extensive a test as that outlined. A code would be a great aid in testing, and he offered the suggestion that if a code is devised by the society there should be a record for the pressure in the manifold. It is an important factor.

Consider Fuel Efficiency

F. H. Floyd believes that the efficiency of the fuel should be considered, and in testing motors it would be well to test this also. The question is largely a matter of refining. We are to have heavier fuels every year, and from his tests he believes them to be better for ordinary work than the high gravity fuels.

G. T. Briggs advocated the taking of carbureter tests. He has found great differences in using different manifolds and ignition apparatus. When he has classified all his data he will submit it to the society.

If the relation of dynamo meter to road tests could be fixed, it would be of great value, Mr. Perrin stated. As a rule carbureter men do not take much stock in block tests, depending on road performances only.

The A. S. M. E. testing code is a good one by which to be guided, said F. Jehle, which code, although for steam work, has a good many points which could be followed. The mechanical efficiency is a factor, and he believes that by previously determining it the indicator cards can be used to advantage. In using cards the compression reading at every valve speed should be taken. Regarding the

use of a standard brake arm, as advised in the Connell paper, he thought it well to consider the use of a brake arm, which is calibrated in foot-pounds rather than pounds. The length of the arm would then be immaterial. He stated further in going over the Chase paper that it would be best to give the valve diagram in inches of piston travel rather than degrees. In his experiments he has found no relation between back pressure and torque.

Mr. Chase Explains

In summing up his paper and closing Mr. Chase explained that some of the considerations which might otherwise have been taken into account in the test were left out, due to the limited number of observers. The reason for the non-use of the Pierce-Arrow carbureter was explained in that this carbureter was ex- a hot air intake and such could not be given with the apparatus as set up. He believes that the relation of road and laboratory testing is an important one and hopes that the engineers on both sides of the matter will get together. The limitations of the manograph are appreciated, he said, as was mentioned in the report. As to the fuel this was of commercial grade. It would perhaps have been better to have obtained a fractional distillation of it. As to the reading of the maximum compression at each stroke, he stated that the A. C. A. laboratory has recently acquired an instrument for this purpose, which, he thinks, will be of value. As far as possible to do so the A. C. A. will co-operate in this matter of testing with the technical schools and the society.

A motion was unanimously carried to appoint a committee to draft a standard code for motor testing.

Mr. Birdsall spoke on the government co-operation in testing. This matter has been taken up by a committee of the Detroit section of the society with the standards bureau of the department of commerce and labor. This committee is composed of Messrs. Heinze, Stoddard and Birdsall. A letter from Mr. Stratton, head of this bureau, suggests a code committee of the S. A. E. He could not say as to the charges for assisting in such work, but he is in thorough accord with the matter.

An idea which was brought out by Mr. Heinze and which has been before the Detroit section for some time is that a fund might be started for the establishing of a laboratory at Detroit by the manufacturers in and near Detroit.

In reiterating Mr. Heinze's remarks on this Mr. Birdsall cited the case of one manufacturer, who, when approached on the subject, stated that he had just recently appropriated $10,000 to establish a laboratory of his own, and he regretted that he had not heard of the scheme before making the outlay. However, this manufacturer said he would be willing to turn over the apparatus to a general laboratory under satisfactory conditions. A motion was unanimously carried that the matter of establishing in Detroit of a general laboratory for all makers of engines be referred to the Detroit council for action and investigation.

The engineers are interested in and are working on the worm gear problem. This was brought out by the discussion which followed the reading of the paper on worm gears by Frank Burgess, who is a gear manufacturer of long experience. He favors the Hindley type as is brought out in the paper, the substance of which follows:

European practice, extending over a period of 15 years, has given ample evidence of the eminent success of the helical type of gearing, and I feel confident in saying that in the near future a large percentage of the cars in the United States will be equipped with this drive. Mileage records of 50,000 to 124,000 have been established.

Regarding the terms "worm," "helical" and "spiral" I would say that "spiral gear" is the term commonly given to a gear the teeth of which have a uniform twist parallel to the axis, although for technical correctness the word "helical" should be used instead of "spiral." A spiral is a line generated by progressive rotation of a point around a fixed axis, with a constantly increasing distance from the axis. Two forms of the spiral are the plane and the conical. Kent states: "When the axes of two helical gears are at right angle, and a wheel of one, two or three threads works with a larger wheel of many threads, it becomes a worm gear, or endless screw, the smaller wheel or driver being called the worm and the larger or driven wheel the worm wheel."

I suggest standardization of terms, and that to avoid confusion any gears of the helical type transmitting motion with shaft angle at 90 degrees, with a speed reduction less than 10-1, be termed "right angle helicals"; and with any other than 90 degrees shaft angle the term "helicals," stating specifically the exact angle of shafts. If shafts are parallel the term "helical spurs" should be used.

As the term "right angle helical" is not as convenient as the term "worm gear," and inasmuch as for motor car work most ratios will be less than 10-1, with 90 degrees shaft angle, I would suggest the term "helical gears" as most appropriate. Otherwise it would be better to use the general term "worm" or "worm gear" to include all reduction ratios, even as low as 1-1. This matter should be settled promptly one way or the other.

Development of Helical Gears

During the past 20 years great strides have been made in the development of helical gears. The adoption of these gears for parallel and right-angular drives has made practically a new element in machine design. Until this form of gearing was made commercial by the invention of special machinery suitable for economical production, there was considerable reluctance on the part of the manufacturers to adopt the helical gear.

The principal reason for the adoption of the helical form of tooth appears to be its peculiar quality of silence, regardless of speed or load. With the best methods of design and assembly, great durability, strength and efficiency are obtained.

The successful worm gear should embody the following qualifications:

1. Cheapness of construction.
2. Strength for resisting shocks.
3. Hardened and smooth surfaces for durability.
4. Material of a suitable composition to reduce friction.
5. Simplicity of construction and mounting.
6. Perfect bearing condition.
7. Noiselessness at any speed or load.
8. Reversibility.
9. Lightness in weight.
10. Efficiency in power transmission.

Considerable discussion has arisen in regard to the relative merit of the straight and Hindley types, the latter having been first used by Hindley, of York, England. In my opinion both can be used successfully, although each has its own advantages and disadvantages. For most purposes, particularly where considerable power is to be transmitted, the Hindley has the advantage, but with ordinary machinery it is somewhat more difficult to obtain the same degree of accuracy that can be obtained in the case of the straight type.

From tests made there is no question but that there is a larger bearing surface on the Hindley type of worm than on the straight. Therefore, this type of gearing will for the same pitch present a bearing of greater durability and manifestly heat less than the straight type, particularly under heavy load.

The straight type may have less trouble with end-thrust bearings. The worm can move in its position longitudinally with the worm axis and therefore does not require as close adjustment of the end-thrust bearings.

With first-class bearings the Hindley type has the advantage, as a smaller and lighter gear can be used, thus reducing expense, especially if made up in large quantities.

The hardening process for the worm should be such as to cause the least amount of distortion, careful methods of heat treatment being employed. The benefit of this is that the gear teeth of the Hindley type, which it is impracticable to grind, can thereby be lapped, making teeth concentric with the hole, which is very essential in a worm of this type. The gear should have a mirror-like polish. In this way with hardened concentric polished tooth surfaces the Hindley type presents a better surface of contact than the best form of straight worm, even though the latter is finished by grinding.

The gear is flanged on one side with eight lugs with hole in the center of each lug for mounting same on differential casing. There is a slight shoulder on each side of this gear so that the differential casing will form a double web, stiffening the gear so that there is no opportunity for side vibration, thereby reducing the bronze metal to a minimum.

The worm gear should be made of a special mixture of hard bronze. The gear should be slightly polished after being cut to insure a perfectly smooth glazed surface to mesh with the hardened polished worm. This set of gears, properly housed, with ball bearings and the right lubricant used, will give an efficiency of at least 90 to 95 per cent.

A simple method of testing the gears for efficiency without elaborate apparatus is to run them in their regular housing, containing a bath of oil, subjected to load to be transmitted. If they do not have a high temperature after running several hours they indicate high efficiency and suitability for the given purpose.

H. C. Thomas Disagrees

A letter from H. C. Thomas on the paper was read, the writer being absent. He disagrees on the matter of changing the worm gearing nomenclature as suggested in the paper. He favors the straight type or worm and thinks there is no advantage of mounting two worm gears on a rear axle as is taken up by Mr. Burgess.

R. H. Rosenberg stated that what he had to say was practically a reiteration of the Thomas letter. In the Hindley gear more than one tooth must engage at a time. The refinements in metals and manufacturing methods make this double contact feature unnecessary. Since the Hindley has more contact than the straight type, there is more friction and consequently more heat and loss. He does not believe that the Hindley gear can be manufactured in this country, due to the trouble it makes. It is difficult to determine the beginning and end of the warp and also the depth. Mr. Alden said that there is agreement on the relative merits of either type. The information on both sides is both positive and absolute. He leans to the straight type and stated that it predominates in the proportion of about 10 to 1 over the hour glass type.

The superiority of either type is a matter of its commercial success, in the opinion of G. L. Markland, Jr. He believes that the Hindley will not be a success because it requires too accurate an adjustment, while the straight type does not.

Mr. Whitney, Mr. Heinze and Mr. Burgess also discussed the paper.

Contest Board Rejects de Palma's Marks

American Automobile Association Awards Speedway Records to Dawson and Tetzlaff — Santa Monica Times Not Approved Because Original Tape Is Not Sent In

NEW YORK, June 29—At the meeting of the contest board of the American Automobile association this week considerable business of importance was transacted, which included the awarding of the speedway records to Tetzlaff and Dawson because de Palma failed to finish; the suspension of two National agents and a Stutz dealer for advertising stock car performances in connection with non-stock events; a decision in the matter of the Flanders entry in the Santa Monica road races and the refusal to accept the records made in the same event until the original timing tape is sent to the A. A. A. The bulletin of the meeting is as follows:

For advertising the performance of the No. 8 National car which won the 500 mile race at the Indianapolis motor speedway May 30, 1912, as being the performance of a "stock car," the Wisconsin Auto Sales Co., of Milwaukee, Wis., and the Howard Automobile Co., of San Francisco, Calif., agents of the National Motor Vehicle Sales Co., manufacturer of National cars, were disqualified and suspended to January 1, 1913. The 500-mile race was run under the rules and with the sanction of the contest board as a class E special non-stock event and was open to any car with a piston displacement of under 600 cubic inches and a minimum weight of 2,000 lbs.

For advertising the performance of the No. 4 Stutz car which won the 50-mile race at Rockingham park, Salem, N. H., on June 8, 1912, as being the performance of "an absolutely stock car," the Empire Motor Car Agency, of Boston, Mass., agents of the Ideal Motor Car Co., of Indianapolis, manufacturer of Stutz cars, was disqualified and suspended to January 1, 1913. The race in question was run under the rules and with the sanction of the contest board as a class E special non-stock event and was open to any motor car with a piston displacement of under 600 cubic inches.

Rule 75(a) of the 1912 contest rules prohibit the advertisement of the performance of a motor car in a sanctioned event as being the performance of a stock car unless such performance is made in a contest regularly sanctioned for and open only to registered stock cars or stock chassis.

These two races were not restricted to stock cars and no technical examination is made by the A. A. A. technical committee of cars competing in non-stock events to ascertain whether they check up with the sworn and approved complete technical specifications on file with the contest board, as is required under the contest rules in those events which are open only to stock cars or stock chassis.

The formal application for reinstatement to good standing of Walter Clark, of Fort Worth, Texas, who participated in unsanctioned track meetings at Waco, Texas, in 1911, was considered and the board refused to reinstate him.

The following official records were allowed and accepted:

Speedway records regardless of class, 500-mile race Indianapolis motor speedway, May 30, 1912.

Distance miles.	Car.	Driver.	Time.
100	Fiat	Tetzlaff	1:13:37.25
150	Fiat	Tetzlaff	1:49:52.84
200	Fiat	Tetzlaff	2:25:50.52
250	Fiat	Tetzlaff	3:07:13.94
300	National	Dawson	3:48:49.30
350	National	Dawson	4:25:15.27
400	National	Dawson	5:04:14.23
450	National	Dawson	5:44:04.54
500	National	Dawson	6:21:06.03

Note.—The time of the No. 4 Mercedes, driven by dePalma, bettered all of the above times, with the exception of the 500-mile mark, but under Rule 79 of the 1912 contest rules no record at an intermediate distance is allowable unless the car finished the event. The No. 4 Mercedes discontinued the race in the one hundred and ninety-ninth or next to last lap.

The participation of the two Flanders chassis, equipped with special—modified E. M. F.—motors, having a bore of 4 inches, a stroke of 4½ inches, and a total piston displacement of 226 cubic inches, in event IV of the Santa Monica road race for class C non-stock cars of 161 to 230 cubic inches, on May 4, 1912, as Flanders, and in the speedway events at the Los Angeles motordrome on May 5, 1912, as E. M. F., contrary to the ruling telegraphed by the chairman of the contest board to E. G. Kuster, the board's representative in attendance at these two contests; to the official referee of the road race, R. P. Hillman, of Los Angeles, and to the promoter of the two events, A. M. Young, of Los Angeles, was considered and it was unanimously decided to accept the resignation of Mr. Kuster as the official representative of the contest board for southern California, to declare Mr. Hillman ineligible for appointment to any official position in connection with sanctioned contests until January 1, 1913, and to disbar the promoter, A. M. Young, for a similar period.

In view of the extenuating circumstances, due apparently to a conflict in authority in the interpretation of the contest rules, it was decided to approve the awards as made by the referees in these two contests, but that in future events sanctioned by the contest board the nomenclature of special cars must be clearly defined.

The time made by various cars in both the Santa Monica road race and the motordrome events were not accepted and allowed as official records for the reason that the board had not yet been able to secure possession of the original printed ticker tape of the timing apparatus used to record the times in these two events.

The following amendments to the 1912 contest rules were adopted; to become effective August 1, 1912:

"No car with a bore, stroke and piston displacement of a different size from the regularly catalogued product of a manufacturer shall be entered in any sanctioned event until its manufacturer shall have filed with the contest board, on official blanks provided for the purpose by the contest board, sworn certificates giving the bore, stroke, number of cylinders, total piston displacement, horse power, and year and model name of the cars, and such cars must be officially entered, programmed and advertised in strict accordance with such registration.

"All other cars must be entered, programmed and advertised in strict accordance with catalogued specifications."

"Rule 113 (on Road Racing) Repair Pits.—There shall be located at the start and finish line one repair pit for each car started, not less than 15 feet long and 8 feet wide. The pits must be located on the right of the course in the direction in which cars are traveling. If located on the same side and in front of the grandstand, there must be an intervening distance of not less than 15 feet between the pits and the stand."

SPEEDWAY FOR NEW YORK

New York, July 1—Formal announcement of the plans for the construction of the Metropolitan motor speedway are made by the Metropolitan Motor Speedway association of New York, which has incorporated with an authorized capital of $1,500,000.

The association has taken over 300 acres on the Jersey meadows near Newark for the purpose of constructing a motordome and stadium. Ground will be broken next month, and the speedway is to be completed within a year. On July 4, 1913, the premier event will be staged—an international 500-mile race. Engineering offices have been opened in the Ordway Building, 207 Market St., Newark, and a corps of experts engaged.

A. R. Pardington, who has been actively connected with the Long Island motor parkway as vice-president and general manager and the Motor Cups Holding Co., is vice-president and general manager of the Metropolitan Motor Speedway, Inc. Fred J. Wagner also is heavily interested financially and as a director. H. E. Hoyt is president of the speedway. Theodore F. Keer is treasurer and W. H. Osborne secretary. The latter also is secretary of the Commercial Maintenance and Motor Co.

It is not merely intended to make the speedway a stage for motor speed contests. Long distance motorcycle races and other races will be held on the brick oval, while the infield will be available for aviation meets, baseball, football, field and track athletics, circuses, Wild West shows, etc. The entire plant will be fenced in by a high fence. The speedway itself is to be 60 feet wide, excepting on the turns which are to be 75 feet in width and scientifically banked with saucer curves.

Grand stands with box and promenade seats will be erected the entire lengths of the straightaway stretches and the proposed capacity of these stands is 200,000. Parking space to accommodate 10,000 cars will be provided in the infield, which will be accessible by means of three double track tunnels, forming the entrance and exit of cars and pedestrians. Garages, repair and machine shops, pits, a hotel and club house, a restaurant and other buildings will be erected. For night events, such as 24-hour races, a number of which are to be run, the 2 miles of speedway will be illuminated in such a way as to provide plenty of light without blinding the drivers.

RESULTS OF NARBERTH MEET

Philadelphia, Pa., June 29—All things considered, the initial race meet of the Belmont Motor Club, held this afternoon at the Belmont Driving park, Narberth, was an ambitious attempt. The 50-mile free-for-all race had an entry list of ten, only four of whom, however, faced the starter. It was won by a Klinekar.

In the 1-mile exhibition for the track record, although three attempts were made, Buman's :54.26 still stands, the nearest approach to it being made by John Menken in a Klinekar, who made the mile in :58 flat, which, by the way, was the fastest lap of the afternoon.

The program was marred somewhat by the withdrawal, enforced and otherwise, of several of the entries, so that with one exception, the fields were small. By the application of liberal quantities of calcium chloride, assisted by an autocar sprinkling wagon that made trips around the track during intermissions between events, the

Tacoma Eager for Road Racing Carnival

Washington Motorists Secure Star Attractions for Their Meet This Week, Including Tetzlaff, Hughes, Mulford and Other Drivers of Note—Course in Shape

TACOMA, WASH., June 27—More cars than were entered in the Santa Monica races last May already have been entered in the 2-day race meet at Tacoma, July 5 and 6. The latest entries received for the races on Saturday, July 6, are two special Flanders cars, one to be driven by Jack Tower and the other by Bob Evans. These with George Joermann, who will drive the Maxwell that won first place at Santa Monica in the small car event May 5, make the complete trio of winners of that event now entered for the similar event at Tacoma.

The complete list of entries to date is as follows: Fiat, Tetzlaff; Fiat, Bragg; Fiat, Verbeck; Stutz, Cooper; Stutz, driver unnamed; National, Whalen; National, DeVore; Pope-Hartford, Hayes; Knox, Mulford; Benz, Bergdoll; Mercer, Hughes; Mercer, Mulford; Mercer, driver unnamed; Cole, Sebastian; Maxwell, Joermann; Flanders, Evans; Flanders, Tower; Ford, Bennett; Ford, driver unnamed.

The program has been rearranged so as to have two events each day of the meet. On July 5 there will be the 150-mile event for medium-weight cars and the 200-mile event for heavy cars, taking in the same classification that governed the big Indianapolis race—under 600 cubic inches piston displacement. On July 6 the meet will open with the light-car event for 100 miles and the 250-mile free-for-all will follow. The races will begin at 10 o'clock each day.

The drivers all agree that the Tacoma circuit is built on fast lines and that a high average will be maintained throughout the two big races of the 2-day meet. Cooper believes the average will be well above 70 miles an hour; and that from 100 to 110 miles an hour can be made on the straightaways is the opinion of Tetzlaff. The course has cost $6,000 and it has taken less than 2 months to build it. Sprinklers and steam rollers, oilers and packers will continue to iron out all wrinkles and soft places until the day before the races.

The curves are all mile-a-minute turns. A little Ford racer has taken them at better than 60 miles an hour and making sensational speed on the straightaway.

The grandstand is practically completed, and arrangements made for transporting the crowds to it. Martial law will prevail about the entire circuit from sunrise to sunset on both July 5 and 6, and national guards will patrol the course and keep spectators within established lines. Street cars will operate on a regular schedule both days beginning at 5 o'clock in the morning, so that there will be as little delay as possible in getting all persons seated. As it is now, the city expects to be overwhelmed with visitors. Special trains will be run every day over the Northern Pacific Railroad to the grand stand, beginning early each morning.

TRACK MEET AT LAUREL

Washington, D. C., June 29—Designed to afford some amusement for the big crowds attending the democratic convention in Baltimore this week, a 2-days' race meet began on the mile dirt track at Laurel yesterday, with Bob Burman as the star. The convention was too attractive, however, and less than three hundred people attended the first day. Burman won back the Remy brassard in his Blitzen Benz, covering 3 miles in 3:20. He had little competition, as only Elmer MacDonald, in the Benz 110 and I. C. Barber, a local driver, in a Warren-Detroit, opposed him. They finished in the order named. The 25-mile race for the Motorine trophy, for cars of 600 inches and less, brought out eight starters. Burman won the event in 27:32, with Raimey's Ohio 99, second and French's Lozier third. Burman gave an exhibition mile in the Benz and made a new Maryland state record of 58¾.

The second day's racing at Laurel yesterday brought out the same fields as the day before. The crowd was very small and the promoters will be out a pot of money on the venture. Burman again clipped the Maryland state mile record, bringing it down to :54¾ in the Blitzen Benz. Summaries:

Five miles—Frank Blair, Mercer, won; I. C. Barber, Warren, second; F. Stewart, Reo, third. Time, 6:04.

Second heat for Remy brassard, 3 miles—E. MacDonald, Benz, won; R. Burman, Benz, second. Time, 3:11¼.

Third heat, Remy brassard, 3 miles—R. Burman, Benz, won; E. MacDonald, Benz, second. Time, 3:06½.

Five miles—R. Burman, Cutting, won; J. Raimey, Ohio, second; I. C. Barber, Warren, third. Time, 5:34.

Five miles—Raimey, Ohio, won; Barber, Warren, second; Blair, Mercer, third. Time, 5:55.

Free-for-all handicap, 5 miles—MacDonald, Benz, scratch won; Barber, Warren, second; C. Campbell, National, third. Time, 6:05½.

Australian pursuit race—Burman, Benz, won, covering 8½ miles. Time, 8:19¼; Campbell, National, second.

DENVERITES REACH CHICAGO

Chicago, July 1—Ten cars carrying thirty persons representing the Denver Chamber of Commerce and several towns near the Colorado metropolis reached Chicago this evening and will stay here until Friday morning. This is the sociability run that left Denver the morning of June 25.

raising of dust was reduced to a minimum.

The summaries:

Five miles, 161-220 class—Bauer, Buick, won; Baker, Cartercar, second; Smith, Empire, third. Time, 6:02⅘.

Five miles, 231-300 class—Homan, Bergdoll, won; Morton, Mercer, second; Ringler, Mercer, third; Fairman, Klinekar, fourth; Gray, Schacht, fifth. Time, 6:00⅘.

Ten miles, 301-450 class—Menker, Klinekar, won; Bocksom, Stutz, second; Millichap, G. J. G., third. Time, 9:55.

Trial for track record—Menker, Klinekar, :58; Frietag, Fiat, 1:01.

Fifty miles free-for-all—Menker, Klinekar, won; Hocksom, Stutz, second. Time, 53:39.

Trial for track record—Haup, Chadwick, 1:02.

Ten-mile handicap—Frietag, Fiat, won; Smith, Jr., Empire, second; Gray, Schacht, third. Time, 10:50.

Ten mile consolation handicap for non-winners—Smith, Jr., Empire, won; Gray, Schacht, second; Ringler, Mercer, third. Time, 5:39.

CONSOLATION PRIZES FOR LOSERS

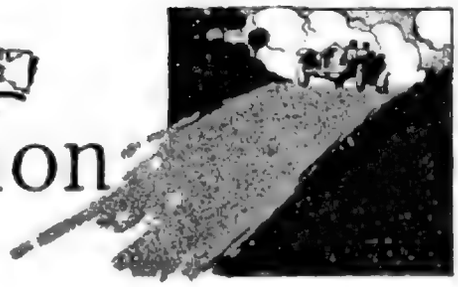
Indianapolis, Ind., July 1—The Indianapolis Motor Speedway Co. has divided $2,100, representing the eleventh and twelfth prizes in the 500-mile race Memorial day, among the drivers who were unable to finish on account of accidents. As only ten cars finished, the two last prizes were not claimed. The $2,100 has been distributed on a basis of the number of laps covered by each driver. It was found that the fourteen cars failing to finish covered 1,092 laps, which gave a basis of $1,9213 a lap for each of the fourteen drivers.

Distribution of the $2,100 has been as follows: Stutz, Anderson, eighty laps, $153.70; Mercedes, De Palma, 199 laps, $382.34; Case, Disbrow, sixty-seven laps, $128.73; Case, Herrick, fifty-four laps, $103.75; Mercedes, Wishart, ninety two laps, $176.76; Lexington, Knight, seven laps, $13.46; Simplex, Dingley, 116 laps, $222.87; Cutting, Burman, 157 laps, $301.54; Firestone-Columbus, Rickenbacher, forty-three laps, $82.62; Marquette-Buick, Lieaaw, seventy-two laps, $138.34; McFarlan, Marquette, sixty-three laps, $121.04; Opel, Ormsby, seven laps, $13.46; Lozier, Matson, 110 laps, $211.34, and National, Bruce-Brown, twenty-six laps, $49.95.

ELGIN RACES ABANDONED

Chicago, July 2—Directors of the Chicago Motor Club at their meeting this afternoon decided to abandon the attempt to hold the road races at Elgin this summer. The Elgin Automobile Road Racing Association, following this announcement, declared that no attempt would be made by that organization to promote the events. This decision on the part of the Chicago Motor Club was anticipated. First of all, the club gave up the idea of staging the annual stock chassis events, but desired to try something in the free-for-all line in August. Following a canvass of the situation it was found entries were hard to get and the prospects of success so small that it was deemed best to give up the races for this year.

Routes and Touring Information



CHICAGO TO HAMMONDSPORT

ELBURN, Ill.—Editor Motor Age—Can Motor Age furnish me with a road map showing the road from Chicago to Hammondsport, N. Y.?—W. M. Cook.

Motor Age cannot show a map which will go into detail as much as you probably want but the Blue Books, volumes 4 and 1 will give you these as well as running directions on the entire trip. Important towns en route to Toledo are South Chicago, Whiting, Grasselli, Gibson, Hassville, Highlands, thence east to Hobart, or, instead of turning east at Highlands, you might proceed directly south through that town, passing through Schererville, thence east via Merrillville, to Valparaiso, at which point the routes merge, and continue via LaPorte, and South Bend in Indiana; proceed to Mishawaka, Osceola, Elkhart, Goshen, Millersburg, Ligonier, Wanaka, Brimfield, Kendalville, Waterloo, Butler, Edgerton, Bryan, Stryker, Archbald, Wausean, Delta, Swanton, Java, and Toledo.

Head north from Toledo, passing through Ida, Dundee, Milan, Stonycreek, Ypsilanti, Wayne and Dearborn to Detroit. This is merely a suggested option and allows you to go through Canada to Buffalo, N. Y. Cross to Windsor, Ont., and proceed through Essex, Ruthven, Leamington, Dealtown, Blenheim, Ridgetown, Clachan, Wardsville, Strathburn, Delaware, Lambeth, London, Thamesford, Ingersoll, Woodstock, Brantford, Alberton, Grimsby, Beamsville, Jordan, St. Catherines, Homer, St. David, Niagara Falls, and Tonawanda to Buffalo.

Through this section of Canada you will find a level farming country. After leaving Tonawanda take the river road and Delaware avenue.

Should you prefer skirting the southern shore of Lake Erie and follow the route taken by all through travel, you pass through Stony Ridge, Lemoyne, Woodville, Fremont, Clyde, Bellevue, Monroeville, Norwalk, Berlinville, Birmingham, Henrietta, Amherst, Elyria, Ridgeville, Bement, Dover, Rocky River, to Cleveland; continuing thence through Euclid, Willoughby, Mentor, Painesville, Madison, Unionville, Geneva, Saybrook, Ashtabula, Amboy, Conneaut, East Springfield, Girard, Fairview, Erie, Northeast, Westfield, Fredonia, Irving, Evans, to Buffalo.

Two routes can be offered to Hammondsport, the more northerly one being more than half macadam. This routes through Williamsville, Clarence, Pembroke, Batavia, Stafford, Leroy, Caledonia, Avon, Geneseo, Groveland, Dansville, Perkinsville, Cohocton, Avoca, Kanona, Bath, and Hammondsport.

The second routing with a few exceptions follows the Empire tour outline through Ebenezer, East Aurora, Wales Center, Harris, Buffalo Hill, Varysburg, Orangeville, Warsaw, Rock Glen, Silver Springs, Chace, Castile, Portageville, Hunts, Swains, Garwoods, Canaseraga, Dansville, Arkport, Hornell, Howard, Avoca, Bath and Hammondsport.

LANARK TO LE ROY, ILL.

Lanark, Ill.—Editor Motor Age—Please outline a route from Lanark to LeRoy, Ill. The trip is to be made in July.—Fred Wolf.

Sterling, Rock Falls and Van Patten lead you to Princeton, 40 miles over good natural roads with a few stretches of sand. You will of course want to visit Starved Rock and Deer park, and to do that you motor through Hollowayville, Seatonville, Peru, La Salle, Utica and Starved Rock. From Princeton to Starved Rock is a distance of 29½ miles. Continue 8 miles to Ottawa, and head south for Peoria over gravel or dirt roads 85 miles through Grand Ridge, Streator, Wenona, Roanoke, Metamora, Washington. A 70-mile run will find you in LeRoy, the intermediate towns being Groveland, Tremont, Mackinaw, Danvers, Bloomington and Downs.

This is a leisurely 2-day trip with Ottawa the stop for the first night. Your run to Starved Rock is about 98 miles, and you can plan to lunch at La Salle, spend a couple of hours in Starved Rock and make Ottawa in an hour or so, as it is only 28 miles. Your second day's run will register 155 miles and Peoria can be figured as the noon stop.

MINNESOTA ROADS

Massena, Ia.—Editor Motor Age—What is the best route from Atlantic, Ia., to Jenkins, Minn.? Jenkins is near White Fish lake and is about 150 miles north of Minneapolis.

We have thought that perhaps the best route would be through Des Moines, Albert Lee, Minn., and Minneapolis. We are more anxious to know about that road north of Minneapolis.—Henry Greenwaldt.

Go to Des Moines over the White Pole road passing through Anita, Adair, Menlo, Stuart, Dexter, going north to Redfield, and east on the River-to-River road through Adel, Ortonville, Waukee, and Des Moines. On the River-to-River road go east to Altoona, Mitchellville, Colfax and Newton. Run north to Laurel, Marshalltown, Albion, Liscomb, Eldora, Iowa Falls, Hampton, Sheffield, Rockwell, Mason City. Between Mason City and St. Paul, 142 miles, the towns are Manly, Kensett, Northwood, Glenville, Albert Lea, Owatonna, Milford, Faribault, Dundas, Northfield, Farmington, Rosemount and St. Paul. It is but 10 miles to Minneapolis leaving over University avenue.

You will find a well traveled road from Minneapolis to St. Cloud through Robbinsdale, Osseo, Champlain, Anoka, Dayton, Elk River, Big Lake, Becker, Clear Lake, Cable and St. Cloud, a distance of 67 miles. The road now lies to Brainerd through Sauk Rapids, Watab, Rice, Royalton, Gregory, Little Falls, Belle Prairie, Topeka, Ft. Ripley, Moffat, Crow Wing. Jenkins is not for fram Brainerd.

Through Iowa and as far as Albert Lea, Minn., there are fair natural dirt roads which are good in dry weather; Albert Lea to St. Paul you will find mostly gravel roads. Some sand will be found between Watab and Royalton, but on the whole the stretch from St. Cloud to Little Falls is fine. Belle Prairie to Brainerd will find some more sand.

The Blue Book No. 5 will give you running directions to Minneapolis.

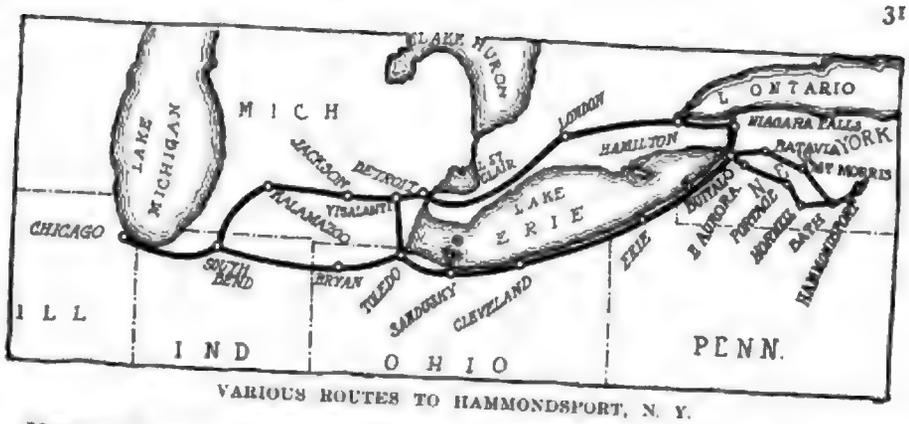
GOING TO MOBERLY, MO.

Oklahoma City, Okla.—Editor Motor Age—I am contemplating a motor trip to Moberly, Mo., and would like information on the best and shortest route. I have some information on the old Glidden route from here to Kansas City, but think there may be a nearer route via. Wichita and crossing the Missouri river at Booneville, Mo., thence to Moberly. Or, if Kansas City is the best route can we go along the north side of the river?—E. C. Wills.

Go west to El Reno and the Chisholm trail will take you north to Wichita, Kans., through Kingfisher, Dover, Hennessey, Bison, Waukomis, Enid, Kremlin, Pond Creek, Jefferson, Medford, Renfrow, Caldwell, Drury, South Haven, Wellington, Wichita. Continuing to Newton on the Santa Fe trail you head east to Kansas City and follow through Walton, Peabody, Florence, Clements, Elmdale, Cottonwood Falls, Saffordville, Emporia, Waverly, Agricola, Williamsburg, Ottawa, Wellsville, Edgerton, Gardner, Olathe, Martin City, Westmoreland, Kansas City.

Two routes are offered you to Marshall,

Mo. The Santa Fe trail can still be followed through Centropolis, Independence, Blue Town, Buckner, Levasy, Wellington, Lexington, Dover, Waverly, Grand Pass, Malta Bend, and Marshall; or taking a road which is macadamed the first 30 miles you pass through Centropolis, Independence, Blue Springs, Grain Valley, Oak Grove, Odessa, Mayview, Higginsville, Corder, Blackburn, Mt. Leonard, and Marshall. Dirt and clay roads prevail from Oak Grove on and continue from Marshall through Slater, Glasgow, Armstrong, Yates, Higbee, Renick and Moberly. It is necessary to be ferried across the Missouri river to Glasgow and the charge is $1.



VARIOUS ROUTES TO HAMMONDSPORT, N. Y.

CHICAGO TO MINNEAPOLIS

Chicago—Editor Motor Age—Kindly inform me about the best route from Chicago to Minneapolis, Minn. I would go sometime in July and make it a 3-day trip. What places would be the best to stop over night.—T. K. Thureson.

Your noon stop the first day would be Lake Geneva, 72 miles; first night, Madison, 79 miles; second day, noon stop, Baraboo, 79 miles; night stop, La Crosse, 103 miles; noon stop third day, Eau Claire, 86 miles; night stop, either St. Paul, at 87 miles, or Minneapolis at 97 miles.

Between Chicago and Madison the towns are Oak Park, Addison, Bloomingdale, Ontarioville, Elgin, Algonquin, Crystal Lake, Edgefield, Henron, Lake Geneva, Delavan, Emerald Grove, Janesville, Edgerton, Staunton, McFarland, Madison. As far as Lake Genera the roads are gravel or stone, the remainder gravel or macadam.

The second day go to Baraboo. Visit Kilbourn, more commonly known as the Dells, and return to Baraboo for lunch. Your itinerary lies through Ashton, Sauk City, Prairie du Sac, Baraboo, Lyons, Delton, Kilbourn. Return to Baraboo over the same route, and continue La Crosse via Abelmans, Reedsburg, LaValle, Wonewoc, Union Center, Elroy, Kendalls, Cashton, Portland, St. Joseph. The first part to Baraboo is mostly macadam or gravel.

There are some excellent views en route for Eau Claire touching Onalaska, Midway, Holman, Galesville, Whitehall, Brackett, Eau Claire. Continue through Menominee, Knapp, Wilson, Baldwin, Hudson, Lakeland, St. Paul. It is 10 miles to Minneapolis leaving the state capitol building over University avenue and crossing the Mississippi river over two iron bridges to Hennepin boulevard. Blue Book No. 4 has running directions.

TOURING NEAR HOT SPRINGS

Chicago.—Editor Motor Age—I was in Hot Springs, Va., the last week of May, and noticed how few cars there were in that town despite the quite good roads. Considerable driving is done, but it is not in motor cars. The roads in general are fair, but the many little sharp rocks play havoc with tires. Several streams are not bridged, and they have very rocky bottoms.

Monterey is situated 25 miles from any railroad, and a drive of 40 miles costs $15, taking two good horses 6 hours' time. Staunton to Monterey, 40 miles, can be made by motor car for $4. The road is fair and it is a pleasant trip over three big mountains.

I took a trip in a car operated between Monterey and Durbin, W. Va., which carries the mail and passengers as well. The start out of Monterey is up a long mountain road and down the other side into Crabbottom valley, said to be the finest land in this part of Virginia. The road runs across the valley on a ridge which sheds the water north and south,—north into the Potomac and south into the James river. Numerous fine springs are to be found along these roads.

On the highest point of the mountain is an old post office and the distance from this point into Durbin is 9 miles, practically all down grade. In many places the road is built along the edge of the mountain and ravines, sometimes several hundred feet from the bottom with steep sides where careful driving is very essential. Some magnificent views are had from the road.—C. H. Roth.

PLANS TOUR TO MEXICO

Deport, Tex.—Editor Motor Age—I am contemplating a trip from Dallas to Mexico City, and would like to have the routing.—M. Moore.

Dallas to San Antonio routes through Grand Prairie, Arlington, Handley, Ft. Worth, Crowley, Cleburne, Cuba, Grandview, Itaska, Lovelace, Hillsboro, Abbott, West, Waco, Lorena, Bruceville, Eddy, Troy, Temple, Little River, Sparks, Holland, Bartlett, Granger, Jonah, Georgetown, Round Rock, Fiskville, Austin, Buda, San Marcos, Goodwin, New Braunfels, Selma, and San Antonio. The distance is 348 miles.

San Antonio to Eagle Pass, 146 miles, routes through Castroville, Noonan, Dunlay, D'Hanis, Sabinal, and Uvalde. Sabinas, Mex., is 63 miles distant and is reached by running through Fuente, Rosa, Nava, and Allende. The stretch to Monclova is 106 miles through Aura, Bayos, Lampacitos, Hermanas, Roderigues, and Abasola; Monclava to Bola is 138 miles by way of Bajan, Joya, Espinazo, Reata, Trevino, Sauceda, Jaral, Filipinas, Carmen, Paila, Rafrail and Pozo. Continuing to Torreon, 114 miles you pass through Myran, Hornos, Matamoros.

A road continues through Zacatecas, Aguascalientes, Celaya, San Juan Del Rio and Tula to Mexico City.

This is a very severe test on driver and machine. In 1910 pathfinders were sent out over this road for the purpose of holding a reliability run from Colorado, but it had to be abandoned.

CANADIAN REGULATIONS

A notice in regard to customs regulations is being sent out to the members of the Automobile Club of Canada by the secretary, and is of prime importance in view of the recent holding up of the cars of two Montreal motorists at the border. Attention is drawn to the importance of strictly observing the customs regulations when crossing the international boundary between Canada and the United States. Motorists are required to stop and report at the frontier port in all cases and not at some interior port. The American customs department is now rigidly enforcing this regulation, and the Canadian customs.

It is necessary for motorists to report at the Canadian frontier port when leaving Canada, and at the first frontier port when entering the States; on the return journey the same formalities must be carried out, should the officer not be at his post whether in day time or at night, find him, it will save you trouble later on.

In cases where the tourist intends stopping from 1 to 3 days only in the United States, the officer may use his discretion and waive the requirement of a bond, but for a longer period, not exceeding 6 months, a bond is required, and may be secured at most of the frontier offices. Frontier ports of the principal routes in this section of the province, where motorists are required to stop, are:

Canada.—Lacolle Junction, Noyan Junction, Abercorn, Mansonville, Dundee, Remmingford, St. Armand, Rock Island, Coaticook, Comin's Mills, to July 1; Hall's Stream after July 1.

United States.—Rouses Point, N. Y.; Alburgh, Vt.; Richford, Vt.; North Troy, Vt.; Newport, Vt.; Ft. Covington, N. Y.; Moore's Junction, N. Y.; St. Alban's, Derby Line, Island Pond and Beechers Falls, Vt.

The Readers'

Construction of Speedster Calls for Special Design—Proper Sizes and Lift of Inlet and Exhaust Valves—Formula for Figuring Piston Length—Ways of Oiling Compared

Building a Racing Car

Pennsylvanian Wants Sizes and Designs of Motor for Speeding Purposes

YORK, Pa.—Editor Motor Age—I have under construction a four-cylinder car which I propose using for speed purposes. The motor is four-cycle, has a bore of 4 3/32 inches and a 5½-inch stroke. The valves have 2 7/16-inch opening, and the valve lift is 1/8-inch. The timing I am considering for this motor is as follows: The intake valve opens 15 degrees after the top center and closes 35 degrees after the bottom center; the exhaust opens 55 degrees before the bottom center, and closes 5 degrees after the top center. Is the lift of the valve and the timing of same proper to get the greatest amount of speed of this size motor?

2—What should the length of the piston be, and what clearance should the pistons have in the cylinders?

3—Are oil holes in the piston an advantage or disadvantage?

4—The flywheel weighs 102 pounds including the clutch; the outside diameter of the flywheel is 18 inches, and it has a face of 4¾ inches. Could the weight of the flywheel be decreased?

5—Are 34-inch tires as safe for speed on a mile dirt track as 32-inch?

I propose building a six-cylinder car with the same size bore and stroke, if the four-cylinder car works out satisfactorily.—J. Pierce.

1—The timing which you mention for the intake valves is approximately correct and agrees with average American practice. The exhaust valve timing, however, is somewhat early, although it is difficult to lay down any hard and fast rule for these figures, since much depends on the design of the motor. In average American practice, the valve timing is as follows:

INLET VALVES.

Open 14.7 degrees crank angle late
Close 35.4 degrees crank angle late
Average opening, 200 degrees

EXHAUST VALVES.

Open 45.3 degrees crank angle early
Close 10.3 degrees crank angle late
Average opening, 236 degrees

The valve lift of 1/8-inch is correct.

2—Average practice for American cars has brought out the following empirical formula for figuring the length of piston:

Length in inches=1.14D,
in which, D=cylinder diameter in inches.

Applying this formula to your case, the piston length works out to be 4.74 inches. This could possibly be made 5 inches, if desired.

Pistons are designed with a slight taper, that is, they are made slightly smaller in diameter at the top than at the bottom. This is because the greatest heat and hence the greatest expansion is at the upper end. This must be allowed for. The clearance at the top should be .012 inch and at the bottom .007 inch.

3—As to the drilling of oil holes in pistons, authorities disagree. For high-speed work, there is undoubtedly some advantage in including them in the piston design, since they furnish additional lubrication to the outer piston face and the cylinder wall. Every precaution must be taken to guard against piston seizure, which is made more possible through the continued high speed and consequent heating to which the piston and cylinder are subjected in the racing car. The argument might be advanced that the use of such oil holes, when placed in the upper part of the piston, affords a means of escape for the gases, and hence loss of compression. Experienced drivers seem to favor the use of oil holes, however. If you will submit a sketch showing where you contemplate locating the oil holes,—near the top or at the bottom—Motor Age will be able to answer this question more intelligently.

4—You do not mention the weight of the clutch, so that it is impossible to tell what your flywheel weighs. If the clutch is of the average type, an 80-pound flywheel will meet with the requirements of the engine.

5—Use 34 by 4½-inch tires.

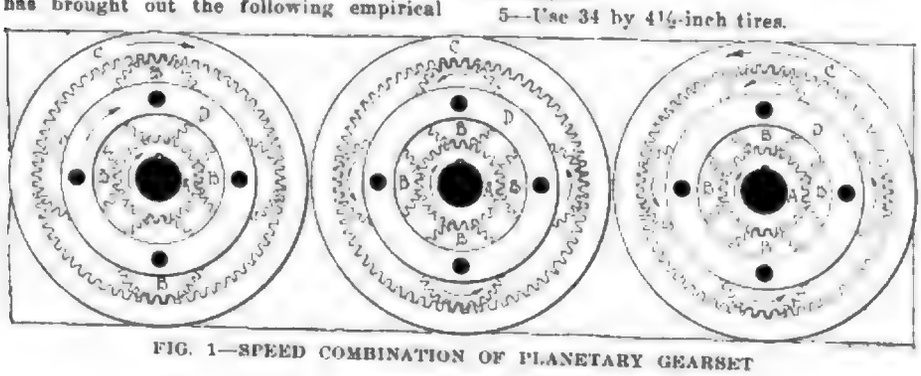


FIG. 1—SPEED COMBINATION OF PLANETARY GEARSET

Methods of Lubrication

Splash System of Oiling Versus Feeding With Fuel—Advantage of Scavenging

COX' CREEK, Ky.—Editor Motor Age—What are the advantages and disadvantages of the splash system of lubrication?

2—Is there any advantage in putting lubricating oil in the gasoline, and are any motor car engines so lubricated?

3—If all the exhaust could be forced from the cylinder with pure air, would it help in any way to ignite or give power to the new charge of gas?—O. J. C.

1—The chief advantages of the splash system of lubrication are its simplicity and inexpensiveness. The chief disadvantages are that the amount of oil supplied to the cylinders usually decreases as the motor speeds up, whereas the amount of oil should be increased. This is because at high speeds the oil does not have time to settle to its level before the connecting rods come around again and they do not dip enough oil. In some motors this is compensated for by lifting the oil trough as the throttle is opened or as the engine speeds up.

2—Yes; this simple method works well in some motors, especially two-cycle ones. The American motors for 1912 in which the oil is fed with the fuel are the Atlas, Dispatch, Duryea and Motorette.

3—Yes; it would provide a mixture unweakened by the inert burned gases.

NEW PISTON REMEDY

Seward, Neb.—Editor Motor Age—How can one test the strength of magnets on magnetos?

2—How many dry cells will I have to use to charge permanent magnets with an electro-magnet?

3—How can one prevent too much oil in the two forward cylinders? The crankcase has a circulating pump that pumps the oil from the subcase into the front end of the crankcase where it flows back into the rest of the case. The motor is a model 17 Buick.—Subscriber

1 and 2—Answered in Reader's Clearing House, Motor Age for June 20.

3—This is caused by worn pistons. It is possible that new rings will help but the chances are that new pistons are necessary.

Clearing House

Why Gearset Slips from High into Neutral—Advantages of Platform Spring Suspension—Proportions of Graphite—Allowable Alterations in Cars

Usual Gas Tank Pressure

Contents of Acetylene Container Little Affected by Changes in Outside Temperature

MONTEZUMA, Ia.—Editor Motor Age—What pressure should a fresh Prest-O-Lite tank register at from zero to 110 degrees above, by the thermometer?

2—How much graphite should be added to a gallon of cylinder oil for proper use in the splash system on the E-M-F and Flanders?

3—Would someone who has had experience with the Wonder Button burner tell me the merits of the same?

4—Would some reader tell me the best vulcanizer to buy, other than electric, for an owner's private use, which would cost less than $15. What has been users' experience with these small vulcanizers?—W. E. McKee.

1—The Prest-O-Lite tank has a pressure of from 210 to 250 pounds per square inch when fresh and before any of the gas has been allowed to escape. The outside temperature has very little effect on the pressure within the tank. There is a slight expansion of the contained gas in hot weather and a contraction in cold, but this difference is not noticeable on the pressure gauge.

2—Finely pulverized graphite may be added in the proportion of about one teaspoonful to the pint of lubricating oil. The two should be very thoroughly mixed. In using graphite in this way, care should be exercised in getting the variety which is prepared especially for this purpose, several brands of which are on the market. There are also prepared lubricating mixtures to be had to which the graphite has already been added.

4—The small vulcanizing outfit is a very valuable apparatus for the private owner who does his own tire repairing. Such outfits may be had at a cost of from $10 to $30.

SLIPPING GEARSET CAUSE

Sylvania, Ga.—Editor Motor Age—While passing through a very deep creek with my Hudson 20 in low with the motor running very rapidly, it suddenly stopped with a pound which cracked the jaws which fasten the rear cylinder to the crankcase; it also cracked the crankcase. Is it possible, or probable, that the crankshaft is bent, since the motor was very noisy upon starting?

2—If so, what should I do?

3—My Hudson is geared 3½ to 1 in high speed and is capable of showing 50 miles per hour. If I should change to 3 to 1, about what ought it to show?

4—Sometimes while running in high speed, the gear lever suddenly jumps in the neutral position. What causes this?—George H. Hilton.

1—It is quite possible that the crankshaft was bent, although the noise might be due to loosened bearings.

2—Send crankshaft to factory.

3—Sixty miles per hour if motor develops sufficient power to turn over under the new conditions at as high a speed as its present maximum. Since the new gear ratio means that the engine must drive the car farther at each revolution it must have some reserve power.

4—The jaws of the direct drive may be worn so that they slip out of mesh. Or any of the connections may be loose between the lever and the gearset. A general tightening up of the gearshift control connections may relieve the trouble permanently.

ADVANTAGE OF PLATFORM SPRING

Des Moines, Ia.—Editor Motor Age—Does the Cadillac company make its own chassis frames?

2—Since what year have the Clark-Carter people made the Cutting car?

3—Of what advantage is the platform type of suspension over the others?—Isaac Ginsberg.

1—Yes.

2—Since 1909.

3—The platform type of spring suspension gives a greater effective length of spring with what is claimed to be easier riding qualities.

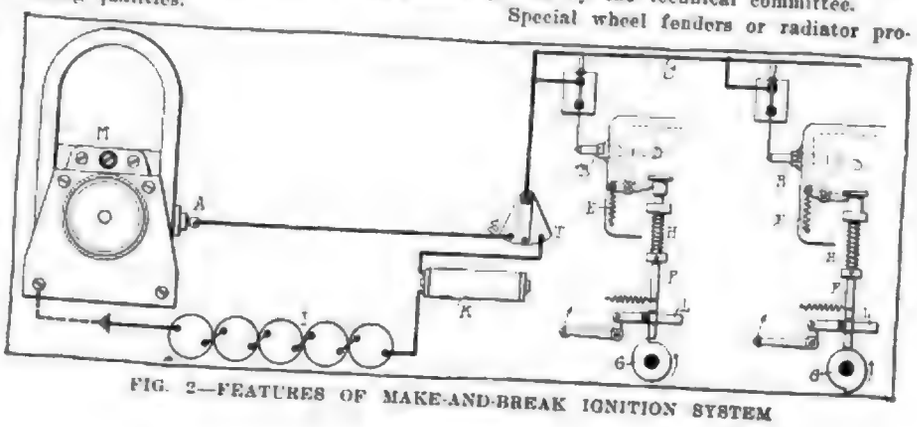


FIG. 2—FEATURES OF MAKE-AND-BREAK IGNITION SYSTEM

Stock Chassis Changes

Options Allowed by American Automobile Association in Stripped Chassis Events

BRENHAM, Texas.—Editor Motor Age—Will Motor Age please tell me through the Readers' Clearing House just what changes are permitted to be made on a stock car and still have it entered in a A. A. A. stock car race.—A Reader.

No changes are permitted on entries in stock car events. Entries in stripped stock chassis events, according to the 1912 rules are permitted the options listed below:

Lighter springs (number of leaves optional; thickness, width and length must be standard).

Piston diameter may be lessened (form of rings and number oil grooves, etc., must be standard).

Angle of steering post.

Length and angle of change gear, brake and other control levers (method of control must be standard).

Driving gear ratio, wheel diameters excepted. (Where a gear ratio is changed on a shaft driven car, any gear ratio may be used of which the standard axle construction will permit.)

Tire and rim equipment (not demountable wheels unless regularly supplied as standard).

Length of clutch, brake, accelerator and other pedals.

Body equipment: contour of dash, seat and body optional, but floor boards must be carried. (See dash requirements.)

Form, volume and location of fuel and oil tanks (system employed in either case must remain unchanged).

Exhaust header and exhaust pipe (optional, except exhaust must be conducted outside the bonnet and so directed as not to raise dust).

Use of shock absorbers.

Winding of springs only (winding of manifolds, fuel and water pipes or electrical connections must be standard).

Bonnets must be carried throughout a contest, but may be cut away at the side for the passage of exhaust pipes only.

Bonnet straps must be added and approved by the technical committee.

Special wheel fenders or radiator pro-

tectors of any design may be used, wind shields excepted, provided they are attached to the car in a manner satisfactory to the technical committee.

Note on lubricaton—Where a reserve oil supply is provided, a pipe connection with hand-pump may be employed to transfer the lubricant to the standard oil receptacle regularly supplied by the manufacturer with the car, but in no instance will it be permitted to connect a reserve oil supply directly with the parts to be lubricated unless standard.

Dash Requirements—In a stripped stock chassis the contour of the dash outside of the limits of the bonnet is optional, but the dash arrangements within the limits of the bonnet contour must be in accordance with the regular stock models; standard stock car dash equipment must be carried thereon and it shall not be cut away for the passage of air or for access to the working parts of the motor in any way which does not conform to the regular stock model.

Additional Parts to Chassis—Dash, seat, body, tank or other permissible equipment—shall be of substantial and safe construction within the approval of the technical committee of the contest board.

TWO-BEARING CRANKSHAFT

Cherokee, Ia.—Editor Motor Age—Was the early Rider-Lewis type a good engine?

2—What does Motor Age think of a two-bearing four-cylinder crankshaft? Are they liable to brake?—J. M. S.

1—The fact that the maker of the Rider-Lewis car abandoned the Rider-Lewis engine in favor of one of the standard makes would seem to show that the early type was not satisfactory.

2—Two-bearing crankshafts in four-cylinder motors make a shorter and lighter motor and permit the use of monoblock castings. There is little chance of breakage if correctly designed.

High and Low-Tension Ignition Systems

Difference Between Low-Tension Magneto and Low-Tension System Explained—Operation of the Make-and-Break Spark Arrangement—Two-Bearing Crankshafts

URBANA, Ill.—Editor Motor Age—Kindly give me an illustrated wiring diagram of the Splitdorf dual ignition system, such as used on the E-M-F 30, showing what wires are grounded and where, also indicate the flow of the current by arrows.

2—How can the Ford magneto run in oil?

3—What is meant by the low-tension or make-and-break. Is the make-and-break used on one system and the break on another?

4—What is meant by high-tension or jump-spark ignition? I understand the jump-spark is used with low-tension magnetos.

5—Would like an illustration of the Ford planetary gear, so I will understand it.

6—What kind of an examination does one have to pass to obtain a chauffeur's license?—A Reader.

1—This was illustrated and explained in these columns of the issues for February 22 and June 6.

2—The windings of the magneto in the flywheel are protected from the oil by the insulation which is baked into them.

3 and 4—In a make-and-break ignition system the spark of the cylinder is made by actually closing and opening the circuit at the point of the spark, so that on the break of the circuit, as the terminals move away from each other, the current is drawn across the increasing gap. Since the current does not have to break through the resistance of the spark gap all at once, as is the case with the more familiar jump-spark system, the tension or voltage need not be so high. Consequently, a current of low tension is used instead of the high-tension current employed in the latter.

The arrangement for make-and-break ignition is shown in Fig. 2. The system comprises a current supply, either magneto or batteries, a primary induction coil when batteries are used, a switch for breaking the circuit, and the igniters. The illustration shows the system with both magneto and battery applied to two cylinders of an engine. One terminal of both the battery and magneto is grounded, the other terminal A of the magneto M is connected to the point S of a three-way switch. The ungrounded terminal of the battery is connected to the induction coil K and thence to the point T of the three-way switch. A conductor C connects the third point of the switch to the stationary or insulated electrode of each igniter. The movable electrodes and the metal of the cylinders furnish the ground return for the current. The movable electrode is operated by a camshaft.

The difference between a high and a low-tension magneto is that a high-tension magneto is a complete apparatus from which a high-tension current can be obtained; while a low-tension magneto is a machine from which, without the aid of a separate auxiliary coil, only a low-tension current can be gotten. Both high and low-tension magnetos are commonly employed in jump-spark ignition systems which require a high-tension current; and where low-tension magnetoes are employed an auxiliary induction coil is generally provided on the dashboard of the car. A comparison of the two wiring diagrams shown in Figs. 3 and 4, one of which is high-tension and the other low-tension, will aid you, perhaps, in learning the difference between the two types of magnetos; all features of both diagrams included within the line L being incorporated in the magneto. In the Bosch high-tension magneto, Fig. 3, the armature has both a primary winding, indicated by the heavy dark lines, and a secondary wiring indicated by light lines; the primary winding being made up of comparatively few turns of coarse wire and the secondary of a great many turns of very fine wire. In the Remy low-tension magneto systems, Fig. 4, there is but a single primary winding C in the magneto, the induction coil and condenser being contained in a separate wooden coil box to which the switch and push button are attached. As for the

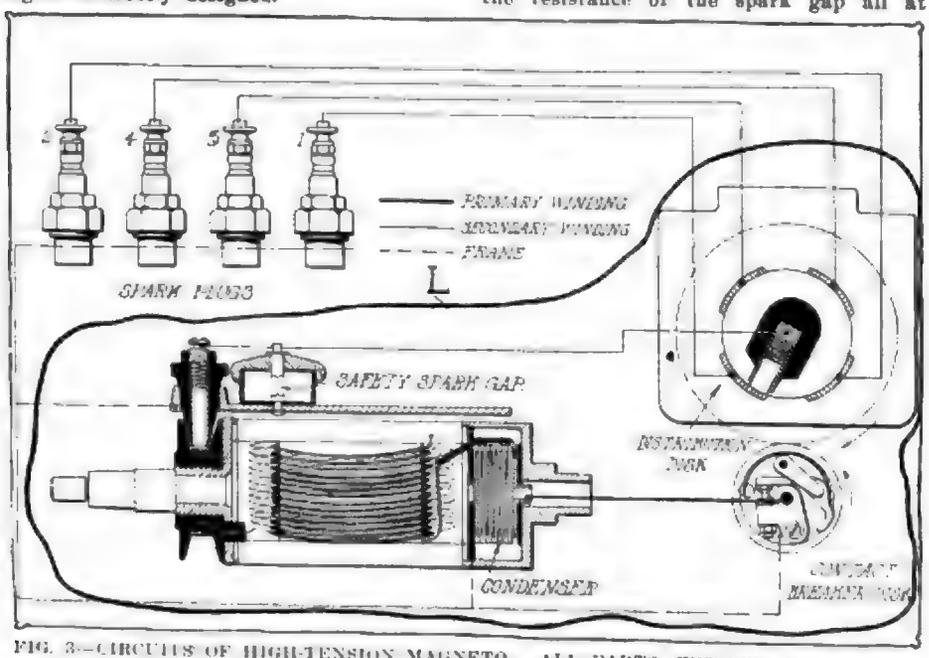


FIG. 3—CIRCUITS OF HIGH-TENSION MAGNETO. ALL PARTS WITHIN LINE L ARE PART OF MAGNETO

Pertinent Questions on Ford Model T

Why Flywheel Magneto Can Run in Oil—Illustration and Explanation of Planetary Two-Speed Gearset—Gasoline Fire Extinguishers—Vulcanization of Tires

ratire ignition systems complete, both are of the high-tension jump-spark type.

5—In the three views of Fig. 2 the principle and construction of a planetary gearset which gives two forward speeds and reverse, is illustrated. These illustrations show four pinions, while the Ford gearset has three, but the principle is the same. In all the diagrams the pinion gear A is keyed to the engineshaft, the internal gear C is an integral portion of a drum which is loosely journaled upon the engineshaft and between the pinion gear A and the internal gear C there are four pinion gears B, in mesh with the gears A and C, that revolve on stubshafts attached to a spider or flange which is loosely journaled upon the engineshaft. The sprocket to which the driving chain of the car is attached is rotably attached to this spider or flange.

At the left is shown the direction of rotation of the various gears on low speed. The gear A revolves at motor speed in the direction indicated by the arrow upon it; the gears B being the same size, turn at the same speed in the opposite direction. The drum containing the internal gear C is held stationary; thus the spider or flange D, supporting the gears B, revolves in the same direction as the gear A, but as much slower as the difference between the number of teeth upon one of the gears B and the internal gear C.

Second or high speed is indicated in the center. By means of a clutch device, not shown in this illustration, the drum and gear C and the gear A are locked together, so that the gears B are held stationary between them, that is, they do not revolve on their own axes, but the whole outfit moves as a single compact unit, and the spider D revolves at crankshaft speed.

The reverse, at the right, comprises an entirely separate set of gears in which the drum carrying the integral gear C is connected to the driving sprocket, instead of the spider D, as in the set described above, and a means is provided whereby the drum supporting the gears B can be held stationary. Therefore, when the drum D is held stationary, and the gears A and B revolve as indicated by the arrows, the internal gear and its drum revolve in an opposite direction to the one on the engineshaft, and reverse speed is obtained.

GASOLINE FIRE EXTINGUISHERS

Orient, S. D.—Editor Motor Age—Kindly tell me the formula for dry powder gasoline fire extinguishers. Many cars suffer from slight or total destruction from gasoline fires on our prairies. These powder fire extinguishers seem to put the fire out promptly.—A Reader.

Three formulas are given below, which are equally well recommended.

1—Potassium nitrate, 60 ounces; sulphur, 36 ounces; charcoal, 4 ounces; colcothar of rouge, 1 ounce. Powder separately, dry, and mix.

2—Sodium Chloride, 4 parts; sodium bicarbonate, 3 parts; sodium sulphate, 1 part; calcium chloride, 1 part; and sodium silicate, 1 part.

3—Sodium chloride, 3 parts; ammonium chloride, 3 parts; sodium bicarbonate, 4 parts.

REPAIRING TIRES

Magnum, Okla.—Editor Motor Age—What is the correct way to splice an inner tube, vulcanizing or by acid cure cold process?

2—What is the best material to be used between the rubber and vulcanizer to keep the rubber from sticking?

3—How long should a casing be left in a steam vulcanizer after being prepared, as illustrated in a recent issue of Motor Age, and what steam pressure should be maintained?

4—Is one heat sufficient to vulcanize fabric together and cure tread? How much pressure should the air-bag contain? —Amateur.

1—By the acid cure cold process.

2—Thin cloth is satisfactory.

3—A casing should be left in the steam vulcanizer from 40 to 50 minutes, after preparation, with 50 pounds steam pressure for ordinary sizes, and a trifle more for larger sizes.

4—Yes, although a better job could be made of it if the fabric were semi-cured at low pressure, then building up the gum with another short cure. The latter method should not be employed by other than one thoroughly experienced, because of the danger of burning the fabric and ruining the tire.

CYLINDER SIZE AND WEIGHT

Bennett, Ia.—Editor Motor Age—Which is the better, a unit power plant, or the transmission detached from the motor and located amidship?

2—Also, which is the preferred type, cylinders cast en bloc, in pairs, or single?

3—How large should the cylinders be in a car weighing from 3,000 to 4,000 pounds?

4—Which type of motor is considered the best, that with cylinders 4½ by 4½ inches, or 4½ by 4¾ and up to 6?—C. Rohlf.

1—Authorities disagree as to the best location of the gearset. There are good cars employing unit power plant, others, equally as good with gearset detached from the motor and located amidship, still others of the same standing place the gearset on the rear axle.

2—Of the 381 chassis models of American cars for 1912, seventy have the en bloc motor, 220 have cylinders in pairs, eight-two have cylinders cast separately and nine in threes.

3—They should have a cylinder volume of from 260 to 430 cubic inches, that is, if a square motor, the bore should be from 4⅜ to 5 inches in a four-cylinder. Average cars rate at 1 horsepower per each 104 pounds.

4—The motor with its bore somewhat greater than the stroke seems to be more in favor.

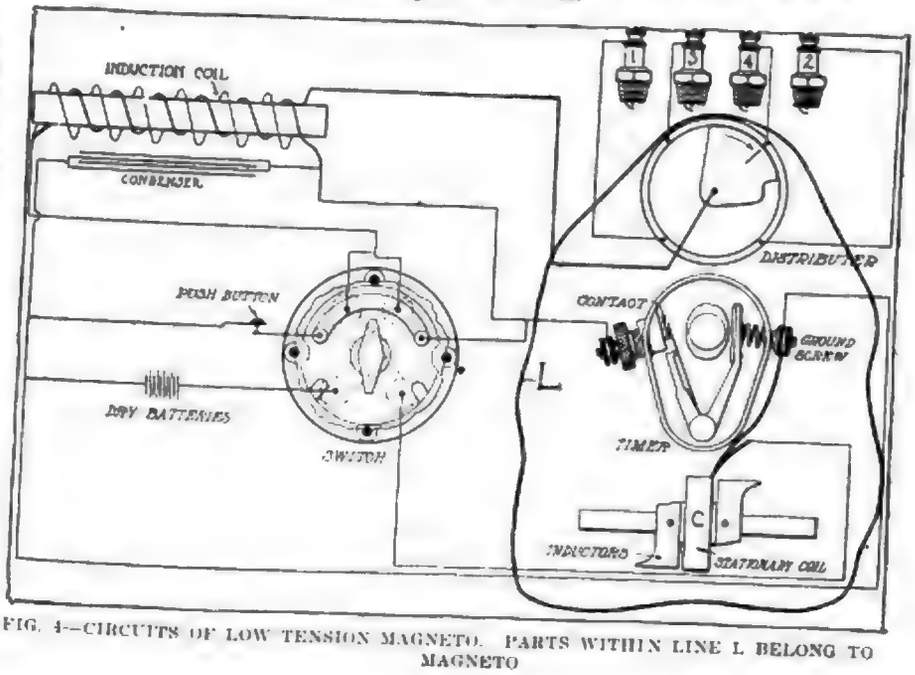


FIG. 4—CIRCUITS OF LOW TENSION MAGNETO. PARTS WITHIN LINE L BELONG TO MAGNETO

Method of Brake Capacity Determination

EDITOR'S NOTE—Paper read by S. I. Fekete before the Society of Automobile Engineers at the summer meeting of that body at Detroit, June 27

A CAR starts under the power of the motor; overcoming a certain resistance it begins to move. The cause of this movement is the action of unbalanced forces; power is in excess of resistance. Meanwhile the motor is getting up to full power and speed, and the car begins to accelerate. That is to say, at each interval of time the velocity is higher in value than at the beginning of the time interval. In the early part of acceleration the force necessary to produce acceleration is equal to the product of mass and acceleration. This could be safely taken as constant up to the velocity of ten miles per hour. Reaching this velocity, the resistance will begin to increase with the intervals of velocity; that is, the resistance at the beginning of the velocity interval will be smaller than at the end of the interval. This increase in the resistance naturally requires an increase in the power output of the motor. If we investigate the power characteristic of a motor, we find that the maximum horsepower is generally reached at 1,000 feet per minute piston speed. As soon as we reach this point, the further increase of velocity is possible only if resistance decrease. Motor output = resistance; under such condition the car will travel with constant velocity. During acceleration, the car accumulates potential energy, due to its mass velocity; this is a capacity for overcoming a resistance:

$$\frac{G}{g} \times \frac{V^2}{2}$$

Work of Brake

If we wish to bring a moving car to rest, we have to consume this energy. A brake is an energy consumer. The most simple known way of consuming energy is by friction. In mechanics we term friction as the product of vertical pressure and friction coefficient.

In a given material the molecules are grouped together with a potential force. That is to say, each molecule will resist outside forces which tend to change its location or to separate it from the system of molecules. The contact surfaces of two materials placed together under a given pressure will deflect into each other. If we change the relative position parallel to the surfaces, certain molecules will break away and the force which retained them in the material will be set free. This force we observe as heat.

Friction Resistance

The force which was necessary to move these surfaces under pressure is the friction resistance. The friction coefficient multiplied by the vertical pressure gives the friction resistance. Consequently the friction coefficient characterizes the material in respect to its molecular structure, deflection into other materials and molecular potential energy. This friction coefficient will change if we change the temperature of the body, because thereby we disturb the molecular potential energy. Further, it will change if we introduce materials between the surfaces. This will disturb the quantity of deflection of the surfaces into each other. Wear of matter is the consequence of small particles being separated.

The physical duty of a brake is to turn superfluous energy into heat. The capacity of a brake to transform kinetic energy into heat units in one second is equal to the heat equivalent of the work unit, multiplied by the surface, by the friction coefficient, by the pressure on the unit surface, and by the velocity of unit distance per second, or in equation:

$$Q = A \times S \times U \times P \times W$$

Q = total heat in thermal units.
A = heat equivalent of unit work.
S = friction surface in unit.
U = friction coefficient.
P = vertical pressure on unit surface.
W = velocity in second.

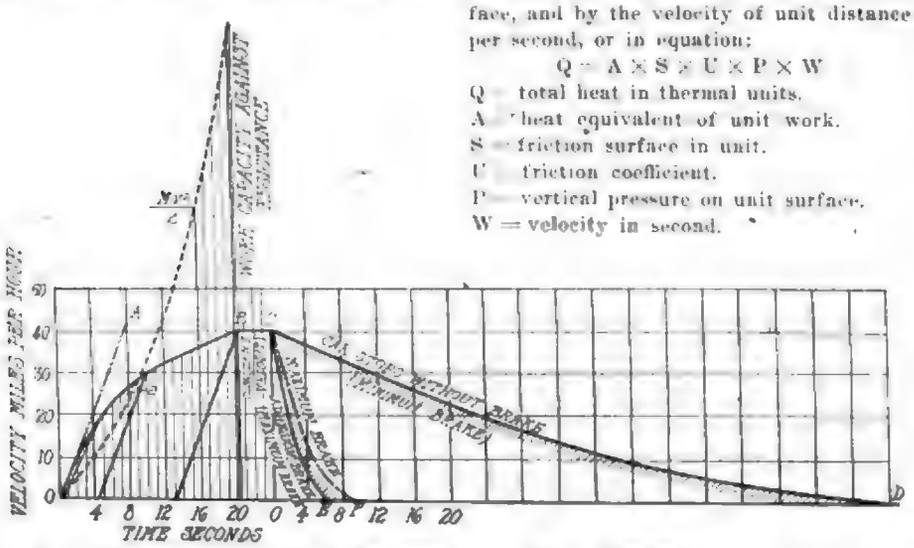


FIG. 1—ACCELERATION AS A MEASURE OF ROAD RESISTANCE. VELOCITY IN MILES PER HOUR IS DOTTED VERTICALLY AGAINST TIME IN SECONDS PLOTTED HORIZONTALLY

If a wheel rim with an axle pressure could roll on a surface without any deflection, such a condition would be rolling without resistance. A wheel rim under the pressure of the axle is deflected into the ground and leaves a path. The quantity of work required to make the path of interval length in an interval of time is the measure of work consumed by resistance.

Road Resistance

In Fig. 2, C represents the method of action of the resistance. In A if we imagine the ground resistance concentrated at the point a, then to make resistance and effort equal would require the following balance:

$$B \times m_1 = A \times m$$

B = the effort of resistance.
m = the lever of resistance.
W = weight of car.
A = the actual effort of the car, produced by the two components of P and W.

From this we see that r, radius of wheel, must be taken into consideration, because resistance is a function of the radius, of the weight, of the velocity, of the axle pressure and of two constants, one of the latter varying with the velocity. To illustrate the influence of radius shown in B, taking the same weight W and the same component P,

$$A \times m > B \times m_1$$

From these many variable quantities, we can readily see that determining road resistance by any approximate formula or by any values given by tables taken from experiments made on a certain car is a very uncertain method.

During the designing of a motor car, it is very advantageous to know the accelerating condition, as giving data of the resistance variation at different speeds. Such a curve assists in fixing the gear ratio, because this is a function of both the resistance and the motor charnetteristic. Furthermore, it gives sufficient information as to the necessary brake capacity of the car.

The Speed-Time Curve

The speed-time curve, Fig. 1, merely illustrates the acceleration and retardation of the car. It is not necessary for brake calculation. It is plotted so that the time integral is distance traversed. In Fig. 1 tangent O A, to the speed-time curve, is the acceleration with constant force and resistance.

Force = Mass × Acceleration

O B is the acceleration or speed-time curve. This is plotted so that the change of resistance with constant force in the time interval will produce a variable acceleration a. When the car reaches a velocity of ten miles per hour, we may assume that the motor will develop normal horsepower; meanwhile, the motor develop-

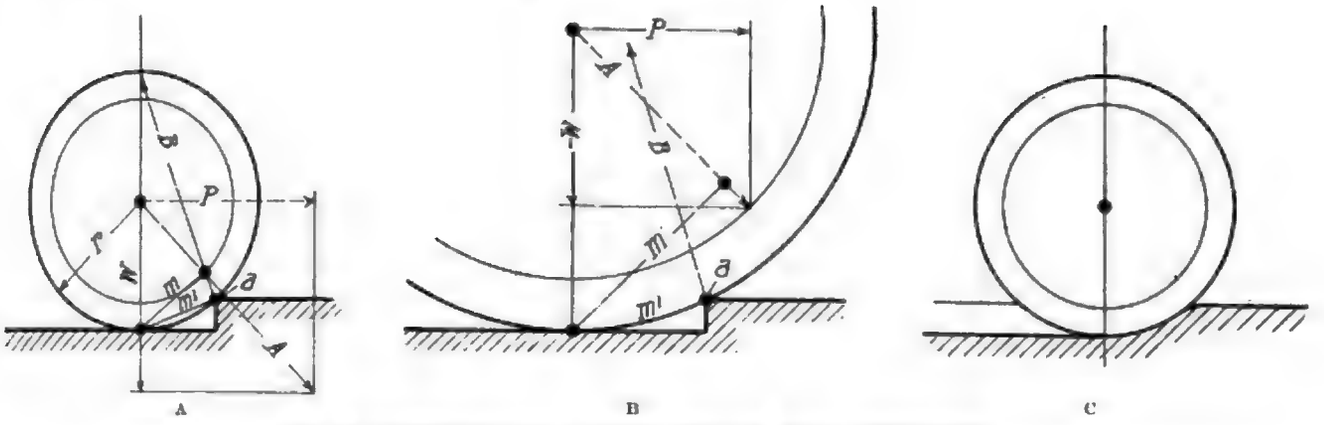


FIG. 2—ILLUSTRATING THE CALCULATION OF ROAD RESISTANCE

ing full horsepower, the car begins to accelerate. During the early part of acceleration the power is in excess of resistance. This excess unbalanced power will cause acceleration. At a certain velocity the car reaches a constant velocity. The velocity is on the line B C. While reaching this velocity, the car accumulates an energy which is capable of acting against retarding resistance before being brought to a rest. The capacity of this work equals the energy which was used to bring the car from the state of rest to this actual velocity. The value of this work is

$$M \times \frac{v^2}{2} \text{ foot-pounds}$$

At the moment when we disconnect the motor we will have a resistance which will retard at the rate C D. This being the action of the smallest resistance the travel will be the longest; it will take the longest time to consume the energy had when disconnecting the motor. This action of resistance we call the minimum brake effect.

Maximum Brake

The possible maximum braking effect on a car is the locked condition of the wheel. In such case resistance is equal to adhesion and the rate of retardation is shown by the curve C E in Fig. 2. The requirements of a set of brakes are those shown by a curve near the maximum brake, as indicated by line C F. Between C D E C are all the possible brakes within the limits of brake maximum and brake minimum.

Determination of Minimum Brake

The total resistance to car motion is the sum of air resistance and road resistance. The air resistance $= 0.0303 \times V^2$.

V = velocity in feet per second.

These values are plotted in the curve O A, Fig. 3.

The road resistance may be determined by the acceleration. Suppose the motor develops normal horsepower and a constant tractive force; this will give a straight line G B which represents the tractive force in the diagram of 800 pounds, given by a 25-horsepower motor. Up to the velocity of 14 feet the accelerating force is constant. From point B we may assume a constant tractive force and a constant horsepower output. Therefore curve B B is parallel to the air resistance curve O A.

Between B A

$$\text{Tractive force (HP)} = \left(\text{force to cause acceleration}\right) \times \frac{V}{550}$$

$$\text{Tractive force (HP)} = \text{mass} \times \frac{dv}{dt} \times \frac{V}{550}$$

$$\text{Force to cause acceleration} = \frac{\text{(HP) tractive force}}{\frac{V}{550}}$$

where: V = velocity in feet per second.

In Fig. 3 ordinates in the area of B C A will give the resistance due to the velocity.

Area C A E F represents the run with constant horsepower and constant resistance. If in D F E we disconnect the motor, we can plot the curve of the minimum brake by first tracing over the curve of air resistance; to this we give the resistance taken from the other side of the diagram—ordinates between B C A. This line represents the resistance without brake.

To get the distance traversed when the car comes to rest, the following calculations are necessary: Where M equals the mass or weight in pounds divided by 32.2, V equals the velocity in feet per second, N equals the energy required, and R_1, R_2, etc., equal the various resistances respectively.

$$\frac{MV^2}{2} = \text{mean resistance} \times \text{distance.}$$

$$\frac{Mv^2}{2} = \text{foot-pounds energy} = N,$$

$$\text{Distance traversed} = \frac{N_1}{\text{Mean resistance}}$$

$$\text{Mean resistance} = \frac{R_1 + R_2 + R_3 + \ldots R_n}{n}.$$

The braking effort is the sum of minimum brake plus the action of brakes. The maximum brake is adhesion plus minimum brake.

Conclusion

First—Road resistance can be determined by the acceleration, the power output and the weight of the car.

Second—The ideal braking capacity of a car should be near to the retardation due to locked wheels.

The Braking Resistance

The braking resistance given by the tangential effort of a brake is equal to

$$T \times R = R_o \times R_1.$$

T = tangential effort.

R = radius of brake drum.

R_o = braking resistance.

R_1 = radius of wheel.

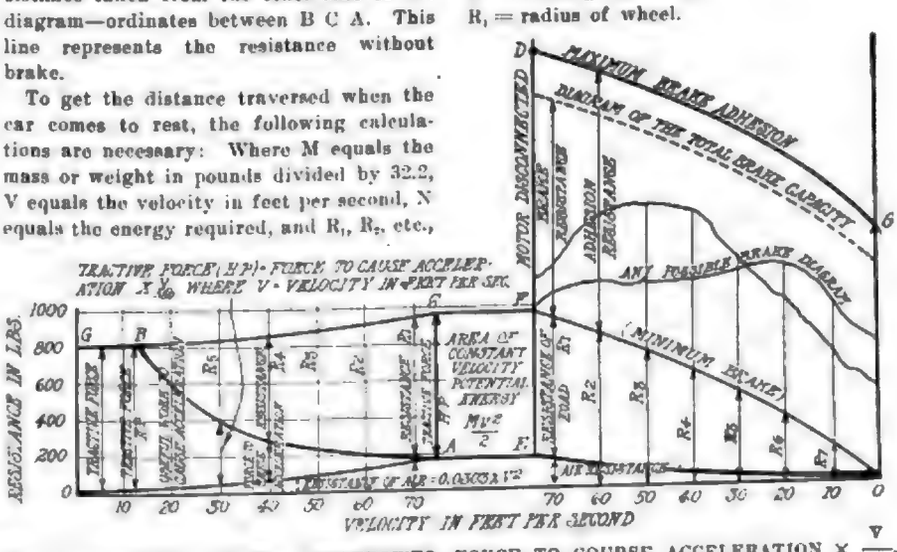
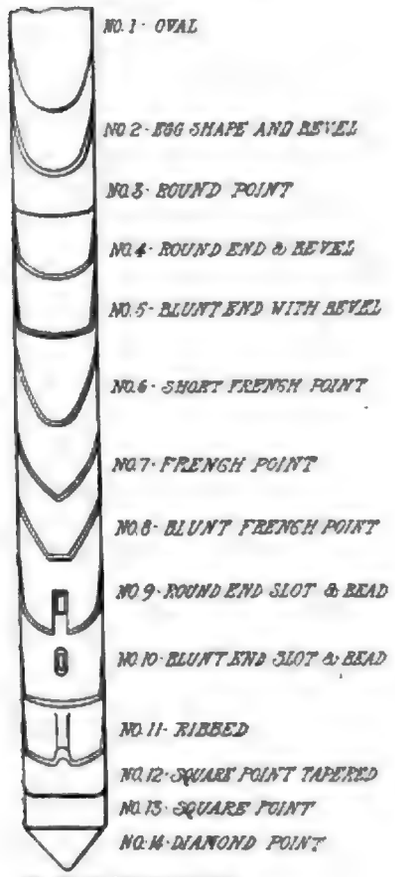


FIG. 3—TRACTIVE FORCE, HORSEPOWER, FORCE TO COURSE ACCELERATION $\times \frac{V}{550}$, WHERE V=VELOCITY IN FEET PER SECOND

Nomenclature and Specifications of Springs



TYPES OF LEAF POINTS

Editor's Note—Third Report of the springs division of the Standards Committee of the Society of Automobile Engineers, presented to that body at its summer meeting at Detroit, June 27. Submitted for discussion.

IN order that the best possible results might be obtained in the work of the springs division, the chairman collected such data as were available from previous reports of the division, the minutes of the discussion recorded on the subject at the last annual meeting of the society and various other sources, and under date of April 16 he had sent through the office of the society a circular letter, together with various exhibits, to the members of the springs division, incorporating recommended changes in leaf spring specification. At the same time a series of blue-print sketches covering suggested changes and recommendations were forwarded to forty or more spring-makers, asking their criticism and advice. To date we have had in the neighborhood of a dozen replies and of these seven answered the questions asked more or less fully. The remainder either preferred to leave the matter in the hands of the springs division or expressed themselves as being unable to give much assistance along the lines requested.

We will first outline the various points of the letter referred to above and enumerate the criticisms on and recommendations as to the same, without going into details.

Exhibit A was a copy of the second report of the springs division of the standards committee. This report was discussed in the January meeting of the S. A. E. and accepted as to specifications for ordering springs.

Under nomenclature one correspondent objected to the term scroll end, it being stated that this was already in common use as meaning the eye at the end of the spring, formed by bending the main leaf around itself, instead of an eye formed by solid welding and drilling. The term shackle end was recommended by the person making this objection.

As to exhibit B, covering spring order specifications, as proposed by the chairman, it was recommended to provide for three different types of eyes:

1. Eyes formed by wrapping main leaf.
2. Eyes formed by wrapping main leaf and other leaves.
3. Eyes formed by solid welding and drilling.

It was also recommended that the committee provide for three different types as regards position of eyes:

1. Eyes looking up.
2. Eyes on plane of spring.
3. Eyes looking down.

It was also suggested that the style of eye be designated separately in each spring, viz:

Front Spring. { Front / Rear Rear Spring. { Front / Rear

One writer thought it would be well to neglect entirely the specification outside diameter of bushing equals I. D. plus ¼", and to not attempt to standardize this dimension except for 2" pleasure car springs where he contended a bushing with a 1/16" wall is universally used.

As to exhibit C, covering the various types of leaf points, there was little exception taken. One manufacturer thought a square end would be as serviceable as any of the others and less costly.

Exhibit D was a series of blue-print sketches showing the various types of springs and the different methods of dimensioning the same. Very little criticism was offered on this except that it was advised that in case of all springs the height of both ends of the spring be dimensioned separately and that in those in which the scroll end was incorporated, the length of the scroll shackle should be given.

It was also suggested that a note be placed somewhere on this exhibit to the effect that all dimensions should be given under full passenger or merchandise load.

In addition to the various exhibits there were appended to the circular letter several questions relating to spring shackles, etc., in answer to which there was some diversity of opinion.

Under question No. 1—should spring shackles stand vertically under load—the majority answered in the affirmative. One recommendation was to incline shackles toward the center when the spring is short and high. Another advised vertical position in some cases but inclined in others, depending on whether the spring was in tension or compression, but did not differentiate.

Question No. 2—as to spring clips—was divided into six separate headings designated by the first six letters of the alphabet:

As to a—kind of steel recommended—two advised mild steel and one 0.30 to 0.35 carbon O.H. steel forging. Another advised a special alloy steel only.

As to b—form of thread—the majority favored the S. A. E.; one thought the U. S. S. good enough, while a third recommended carriage thread.

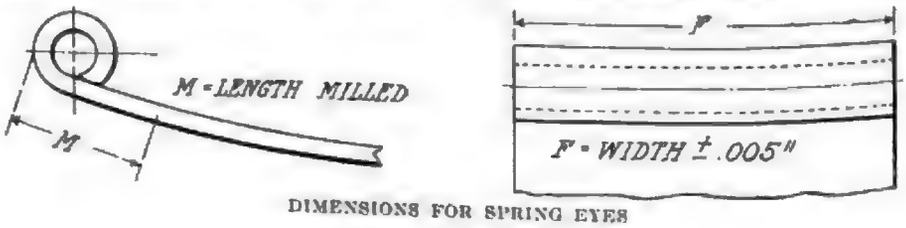
As to c—diameter of shank on spring clip—the following table was suggested:

For 2" spring, ½" shank.
for 2½" spring, ⅝" shank.
for 2½ to 3½" spring, ¾" shank.

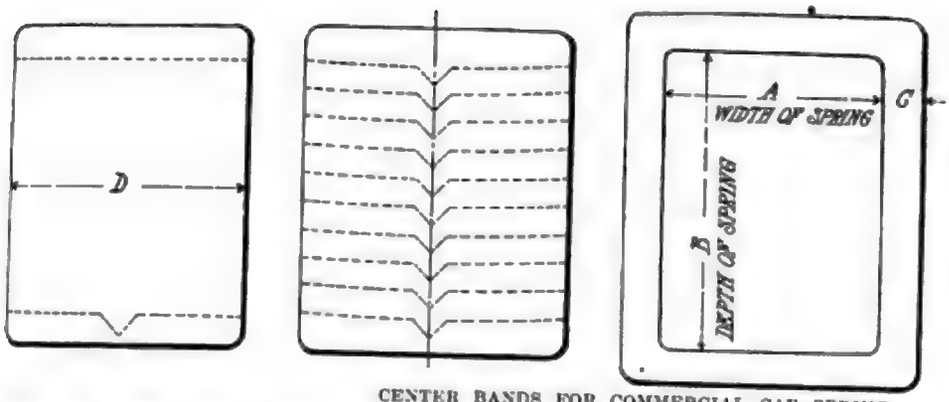
As to d—type of nuts—one manufacturer suggested one hex nut with cotter pin or lock washer or castellated nut with cotter pin; another advised two square nuts, while a third thought a single hex nut without any locking device of any kind sufficient.

As to e—formula for figuring length of spring seat—there was only one formula given. In this W denoted the width of spring. The length of seat was given as being equal to 2¼ W.

As to f—formula for distance between clips—it seems to be the consensus of opinion that the clips should be as close to each other as possible. The question was answered in one case by a formula—distance



DIMENSIONS FOR SPRING EYES



TRUCK CAPACITY	A	B	G	D
1½-TONS			5/8"	2½"
2-TONS			3/8"	2½"
3-TONS			3/8"	3"
5-TONS			½"	3"
BAND MATERIAL		"DEAD" SOFT IRON RECOMMENDED		

CENTER BANDS FOR COMMERCIAL CAR SPRING

between clips equal 1½ W, W being the width of spring.

Question No. 3 called for a formula for determining the size of spring eye-bolts. One formula was given as follows:

Diameter of bolt $= \frac{W}{4}$. W equals spring width.

Two tables showing various sizes of bolts for different spring widths were forwarded. These compare favorably with each other and are summarized as follows:

For 1½" to 2" spring, ½" bolts.
For 2¼" spring, ⅝" bolts.
For 2½" spring, 11/16" bolts.
For 2¾" to 3" spring, ¾" bolts.
For 3½" spring, ⅞" bolts.
For 4" to 4½" spring, 1" bolts.

After due consideration of the recommendations enumerated above it has been decided by the springs division to make the following recommendations:

Nomenclature

First—That the old-time scroll end be retained to indicate the method of forming that end. The term shackle end seemed to the division to be ambiguous and to convey no definite idea of a scroll effect.

Second—That the term spring clip be adopted to indicate the forging used to fasten the spring to the axle.

Third—That the following fourteen leaf points be known by the respective terms placed opposite them as follows:

Fourth—That the spring clip shank thread be S. A. E. standard.

Fifth—That the dimensions given below of shrunk center bands, which the division has found have been used in some instances, be printed for the information of S. A. E. members.

Specifications for Ordering Springs

Sixth—After careful consideration of the spring order specifications submitted to our last report, it has been decided to make several changes in both the written specifications and in the sketches accommore complete. In the sketches given for dimensioning purposes we have included the spring shackles and shown them standing in a vertical position—under full load—as we think that this is the accepted practice.

SPRING ORDER SPECIFICATIONS

Type of car.....

Type of spring { Front / Rear } See Nomenclature Diagrams in Second report of springs division †

Material .....

Type of leaf points.....
See diagrams (in this report)

Width of Leaf { Front..... / Rear..... / Transverse..... }

Method of clamping spring in center { Bolt / Nibs / Band } See center bolt—second report of springs division* — and shrunk band specification in this report.

Type of Eye { No. 1 Eye former with main leaf. / No. 2 Eye formed with main leaf and other leaf or leaves. / No. 3 Eye formed by welding and drilling. / a. In.* / b. Out.° }

Fill in by number and letter

	Front eye	Rear eye
Front spring.....		
Rear spring.....		
Transverse spring		

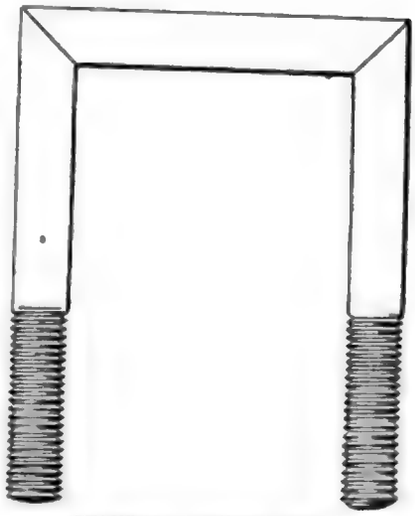
Eyes { Bushed*. { Material ..... / Inside diameter .....in. / Outside diameter of bushing = I. D. × ⅛" } Reamed / Not Reamed
Not Bushed* Inside diameter...in. } Reamed / Not Reamed

*Tolerance on bushed eyes; 0 to .002" under standard diameter.

*Tolerance on bolt for bushed eye: .003" to .004" under standard diameter.

*Tolerance on eyes not bushed: 0 to .005" under standard diameter.

*Tolerance on bolts for eyes not bushed: .007" to .008" under standard diameter.



STANDARD SPRING CLIP

Rebound Clips Number

Type { Clinched / Bolted }

		On front spring R	On front spring L	On rear spring R	On rear spring L
Weight carried above springs	Car empty.....	lbs..	lbs	lbs..	lbs
	With max. load.	lbs..	lbs	lbs..	lbs

Distance between two most adjacent parts liable to strike, measured under maximum load..... { Front ...in. / Rear ...in. }

Do springs take driving effort?.....

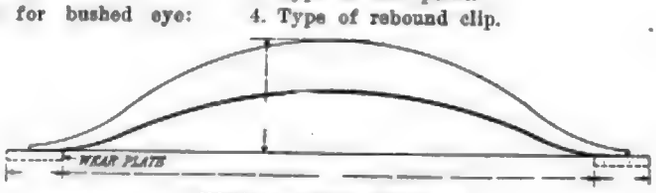
Do springs take braking effort?.....

	Front	Rear
Shackles— Under tension or compression		

To Be Left to the Springmaker

1. Number of leaves.
2. Gage of steel.
3. Type of leaf point.
4. Type of rebound clip.

ARRANGEMENT OF SPRING EYES



NORMAL BOW OF SPRING

Proportions and Specifications of Frames

EDITOR'S NOTE—Third report of the frame sections division of the standards committee of the Society of Automobile Engineers presented to that body at its summer meeting at Detroit, Mich., June 27.—Submitted for discussion.

THE following proportions and specifications are submitted for consideration as recommended practice in frame construction. These figures were arrived at through correspondence and conversation with various people interested. We are indebted to L. R. Smith for a great deal of practical suggestion for various frame proportions. In many instances the figures represent standard practice at the present time, but in some cases the figures do not represent exactly any particular construction, but are composite figures. For instance, a man who is now using a side rail having a front end curve of 13 9-16 inches radius could probably use a 12 or 16-inch radius just as well in designing such a frame over again.

The figures in this report are, to a certain extent, of empiric rather than scientific derivation. The frame is a part of the car into which the element of shock enters so largely as to destroy any mathematical data regarding any theoretical proportions and cannot be figured the way a bridge would be constructed, even though it may act as a bridge when the car is standing on the floor. The attempt to proportion the cross-section of the frame to either horsepower rating of engine, wheelbase of car or number of passengers carried, would be impracticable for best results, although there is a slight relation between the wheelbase and depth of side rail section, and the strength of certain sections may be increased by gage of metal for different conditions.

The following recommended practice is suggested for acceptance:

A—Amount of drop between top of side rail and front spring bolt:

4 -inch drop for 3 -inch side rail
4½-inch drop for 3½-inch side rail
5 -inch drop for 4 -inch side rail
5½-inch drop for 4½-inch side rail
6 -inch drop for 5 -inch side rail

B—Represents radii or curve of bottom flange of side rail at front end:

8, 12, 16, 20 and 24 inch

C—Rear end rise—amount of difference between level of frame at rear end center of side member:

2, 3, 4 and 5 inch

D—Radii of combined curve in bottom flange of side member to make rise at C:

10, 20 and 30 inch

E—Side rail offset to commence at least 10 inches back of rear end of front end taper.

CROSS-MEMBERS

F—Widths of recommended size of gusset plate ends—4, 5 and 6 inches.

G—Radii of curved gusset plates to be 3 and 4 inches. Straight gusset plates to be cut at angle of 45 degrees.

It is considered impracticable to stipulate recommended practice as to shapes of cross-members, due to different radiator designs, etc. Members with straight drops, however, could be made to have drops vary in multiples of ½ inch, adopting a constant angle for the dropped portion.

SUB-FRAME

H—Top of sub-frame to be on line with inner side of lower flange of side rail.

I—Width between bars for flywheel clearance to be 17, 17½ and 18 inches, respectively.

J—Recommended width of all engine bar flanges to be 1½ inches.

WIDTH OF FRAME

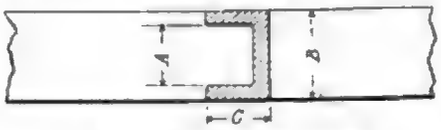
A recommended practice of 30 inches for front end of frame is submitted, the width in rear to vary with the side rail offset.

PRACTICE OF HOT RIVETING

Diameter of Rivet	Diameter Drilled Hole	Spacing Distance Between Centers
7/16 inches	11/32 inches	1½ inches
⅝ inches	13/32 inches	1½ inches

MISCELLANEOUS

It may be possible to recommend a



STANDARD FRAME ANGLES

depth of side rail for a certain wheelbase something as indicated in the following table:

Wheelbase	Depth Side Rail
110-125 inches	4½ inches
125-135 inches	5 inches
135 inches up	5½ inches

Several recommendations regarding the side rail sections and material have already been passed upon by the committee. Later practice, however, suggests certain changes and additions. We therefore submit the following revision for the approval of the society:

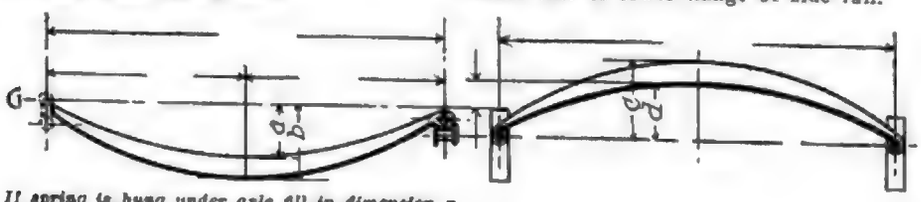
SIDE RAIL SECTIONS

Designation Inches	C—Flange Width Inches	A—Punch Size Inches	B—Using .125 Inches	Variable Outside Dimension Using .156 Inches	Using .187 Inches	Using .250 Inches
3	1½	2⅝	3	3 1/16	...	...
3½	1½	3¼	3½	3 1/16	3⅝	...
4	1½	3 11/16	3 11/16	4	4 1/16	4 1/16
4½	1½	4¼	4⅝	4 7-16	4½	4⅝
5	1¾	4⅝	4⅞	4 11/16	5	4½
5½	1¾	5½	5⅝	5 7-16	5½	5⅝
6	1¾	5⅝	5⅞	5 11/16	6	6⅝

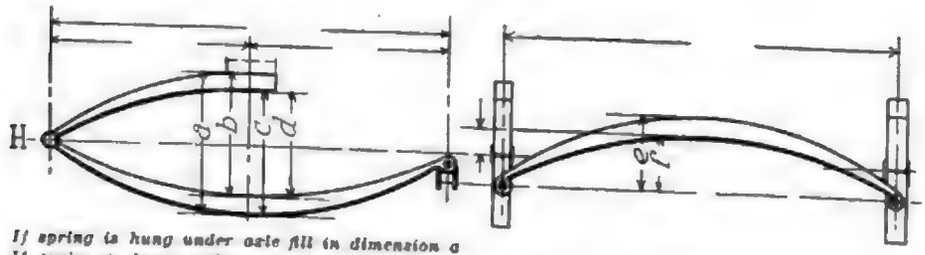
MISCELLANEOUS

Center sections of side rails to be designed in multiples of 2 inches, depending on the load.

Taper of side rail ends to be 1-16 to 1 inch. This taper, coincident with center sections in multiples of 2 inches will produce a depth of section at extreme ends of side rails varying in multiples of ⅛ inch.



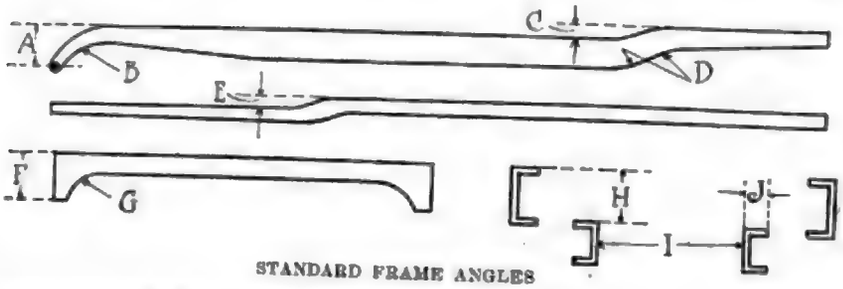
If spring is hung under axle fill in dimension a
If spring rests on axle fill in dimension b
If spring is hung under bracket fill in dimension c
If spring rests on bracket fill in dimension d



If spring is hung under axle fill in dimension a
If spring is hung under axle and is hung under bracket fill in dimension b
If spring rests on axle and rests on bracket fill in dimension c
If spring is hung under axle and rests on bracket fill in dimension d
If spring is hung under bracket fill in dimension e
If spring rests on bracket fill in dimension f

STANDARD SPECIFICATIONS FOR SPRINGS

Trade Matters from Eastern Cities



STANDARD FRAME ANGLES

S. A. E. SPECIFICATION NO. 10—30

.30 Carbon Steel

Carbon	.25 per cent to .35 per cent	(.30 per cent desired)
Manganese	.50 per cent to .80 per cent	(.65 per cent desired)
Phosphorus, not to exceed	.04 per cent	
Sulphur, not to exceed	.04 per cent	

S. A. E. SPECIFICATION NO. 32-25

.25 Carbon, Medium Nickel Chromium Steel

Carbon	.20 per cent to .30 per cent	(.25 per cent desired)
Manganese	.30 per cent to .60 per cent	(.45 per cent desired)
Phosphorus, not to exceed	.04 per cent	
Sulphur, not to exceed	.04 per cent	
Nickel	1.50 per cent to 2.00 per cent	(1.75 per cent desired)
Chromium	.75 per cent to 1.25 per cent	(1.00 per cent desired)

NEW YORK, July 1—Claire L Barnes, third vice-president and member of the board of directors of the Motor and Accessory Manufacturers, has resigned owing to a series of shifts in the membership in the association. Mr. Barnes has been one of the leading spirits of the organization and it is generally expected that he will soon resume his official connection with the M. A. M. William H. Crosby, of Buffalo, was chosen to fill out the unexpired term of Mr. Barnes as director until January 1, 1914, and S. C. Billings has been selected to take up the duties of third vice-president until January 1, 1913.

The following concerns were elected to membership in the organization: Hood Rubber Co., Boston, Mass.; Lefever Arms Co., transmissions and jackshafts, Syracuse, N. Y., and the American Hardware Corporation, Corbin Screw Corporation, machine screws, New Britain, Conn.

MILES WILL ENTERTAIN N. A. A. M.

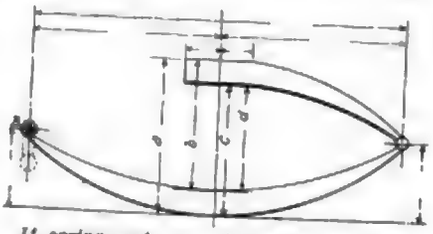
New York, July 1—Instead of holding regular meetings in July and August, the National Association of Automobile Manufacturers will combine the two meetings and hold the joint session at Christmas Cove, Me., the summer home of Samuel A. Miles, general manager of the organization. The meeting is scheduled for July 30 and will be attended by practically the entire board, together with several members of the Motor and Accessory Manufacturers and a few officials and guests from headquarters.

Indefinite postponement has been taken as far as the convention of sales managers is concerned. The convention was originally planned for the next week, but owing to the press of late business and preparation for the 1913 season it was found inadvisable to hold the convention until later. According to announcement made by the Automobile Board of Trade, the convention will probably be called for September. The regular monthly meeting of the A. B. of T. will be held July 11.

CONDITION OF RUBBER MARKETS

New York, July 2—Special telegram—A firmer tone was apparent in the crude rubber markets of the world during the past week. Trade in New York has been of small proportions and most of it was for prompt delivery. A slight hardening of prices was felt and the current level is on a basis of $1.12½ for up-river fine Para rubber.

At the London fortnightly auction, which is scheduled for the first and third Tuesdays of each month, the offerings include 580 tons of plantations. This is considerably less than was expected. Not including Tuesday's auction, the offerings of plantation grades so far this year have amounted to nearly 3,000 tons more than last year during the corresponding period.



If spring rests on axle and is hung under bracket fill in dimension a

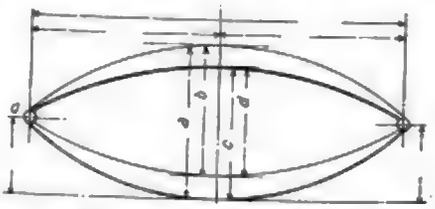
If spring is hung under axle and is hung under bracket fill in dimension b

If spring rests on axle and rests on bracket fill in dimension c

If spring is hung under axle and rests on bracket fill in dimension d

If spring rests on axle fill in dimension a

If spring is hung under axle fill in dimension b



If spring rests on axle and is hung under bracket fill in dimension a

If spring is hung under axle and is hung under bracket fill in dimension b

If spring rests on axle and rests on bracket fill in dimension c

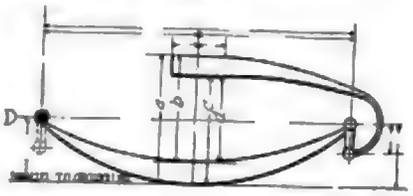
If spring is hung under axle and rests on bracket fill in dimension d

If spring rests on axle and is hung under bracket fill in dimension a

If spring is hung under axle and is hung under bracket fill in dimension b

If spring rests on axle and rests on bracket fill in dimension c

If spring is hung under axle and rests on bracket fill in dimension d



If spring rests on axle and is hung under bracket fill in dimension a

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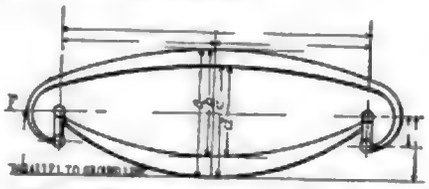


If spring rests on axle and is hung under bracket fill in dimension a

If spring is hung under axle and is hung under bracket fill in dimension b

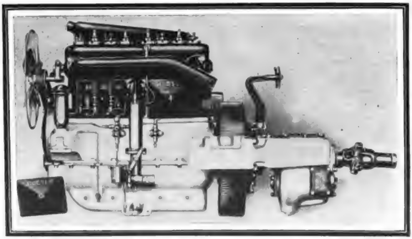
If spring rests on axle and rests on bracket fill in dimension c

If spring is hung under axle and rests on bracket fill in dimension d

DIMENSIONS TO BE SPECIFIED IN SPRING ORDERS

Hudson Model 37 Has Larger Motor

Latest Four-Cylinder Engine Has Cylinders 4⅛ by 5¼ Inches in Size

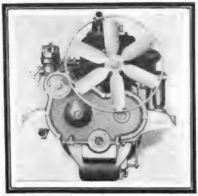


VALVE SIDE OF NEW UNIT POWER PLANT OF HUDSON

HUDSON motor cars for the season of 1913 differ radically from any previous products of this factory. Of greatest interest in the announcement for the coming season is the statement that a six-cylinder car will be put on the market in a short time, but the details of the six are not announced at this moment. Of but slightly less importance is the announcement of the new four-cylinder model for 1913 described herewith.

The new four-cylinder model is known as the Hudson 37 and while the general arrangement of the chassis is quite similar to that of 1912 the motor is an entirely new design, larger but somewhat simpler in construction than that of this year. Like the present motor, the new engine is a four-cylinder L-type construction and a part of the unit power plant but the bore and stroke of the cylinder larger, the dimensions being 4⅛ by 5¼ instead of 4 by 4½ as in the present model. It is stated that the new motor will develop 37 horsepower on the block at 1500 revolutions per minute. The valves are of nickel steel and are interchangeable. They are 2 inches in diameter, giving 1¾ inches opening. The valves are operated by pushrods that are longer and larger than is usual in this type of engine. The pushrod bearings have been redesigned with the idea of making them easily removable. All of the valve system is enclosed in a dustproof casing, this casing, as last year's, is provided with two plates which are easily removed for inspection.

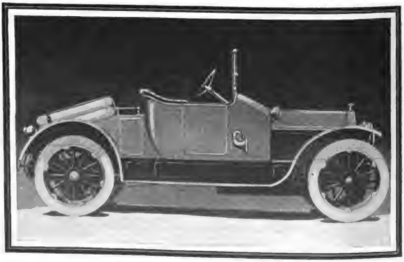
The pistons are longer than obtains in ordinary practice in order to better distribute the side thrusts between cylinders and pistons. The wristpins are pressed into the pistons and secured with nickel-steel studs and cotterpins. The wristpin bearing is of hard phosphor bronze $1\frac{1}{16}$ inch in diameter by 1¾ inch long and is pressed into the small end of the connecting rod. The connecting rods are deep I-beam section, drop forged and heat treated. The bearing cap is secured to the connecting rod by four nickel-steel bolts and castellated nuts. Thin shims are placed between the cap and connecting rod in order to simplify the taking up of the bearings in case of wear. The crankshaft is of the three-bearing type, the front and middle ones being 2 inches in diameter while the rear bearing is 2¼ inches in diameter by $3\frac{15}{16}$ inches long. The front bearing is $2\frac{9}{16}$ inches long and the middle one 3 inches in length. Connecting rod bearings are 2 inches in diameter by 2⅝ inches in length. The crankcase is an aluminum alloy and carries the three crankshaft bearings bolted to the upper portion of the case so that the lower part can be removed without interfering with the bearing adjustment. Camshaft is made of special steel and the cams are integral with the shaft. This shaft runs on three nickel babbit bearings. The timing gears are helical and are enclosed in a dustproof case in the front of the motor.



FRONT VIEW OF MOTOR

The cooling system is of the same design as employed in the 1912 cars and consists of a centrifugal water pump with a vertical tube radiator secured to the side members of the flange. A reinforcement in front of the radiator gives it the appearance of a cellular construction.

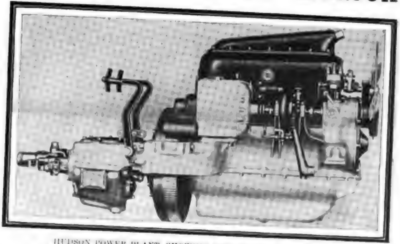
The motor is lubricated by a constant-level splash system with the reservoir beneath the crankcase. A new type of pressure distributer plunger pump oper-



1913 HUDSON MODEL 37 ROADSTER

Details of New Car for 1913 Season

Delco Starting, Lighting and Ignition System and 12-Inch Upholstering



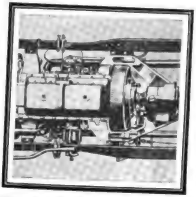
HUDSON POWER PLANT, SHOWING DELCO MOTOR GENERATOR

ated by the camshaft furnishes oil to the front and rear bearings. The oil before being fed to the motor goes through a strainer and then to the pump. An oil pressure gauge on the dash indicates the circulation.

The motor is equipped with a special carbureter which is provided with a dash strangler to facilitate starting in cold weather. The supply of gasoline to the carbureter shows an advance in practice over 1912 construction. This year fuel is supplied by gravity but in the new model gasoline is fed to the carbureter under pressure. The pressure in the tank is regulated automatically by an air pump driven by the motor camshaft and an air gauge on the dashboard indicates the pressure in the tank.

Consideration of the ignition system develops one of the most comprehensive changes in the Hudson 37. Instead of the high-tension magneto and battery employed this year we find that the three functions of ignition, starting and lighting are performed by a single system. This is the Delco electric combined system. So far as the ignition itself is concerned, the Delco system furnishes a dual ignition with a magneto type of spark from the generator for ordinary running and dry battery ignition in case of emergency.

This combination ignition, starting and lighting system has been described in detail in the pages of Motor Age. It is sufficient to say that so far as the starting function is concerned the motor is cranked and started by electricity, the generator momentarily becoming a motor and using current which has been stored up by it in a storage battery. It runs as a motor only long enough to start.



ARMS AROUND CLUTCH TO MOTOR BASE

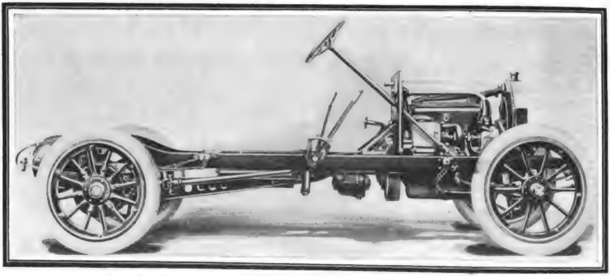
THREE-QUARTER VIEW OF HUDSON TOURING CAR

The clutch is of the same design as is employed at present. This is a multiple disk type, self-contained in an oil-tight case which is a part of the flywheel. All disks are made of steel stampings and are $8\frac{11}{16}$ inches in diameter. The driving disks have cork inserts. The clutch spring is located in a hole bored in the end of the crankshaft and the pressure is transmitted to the clutch drums through a ball-thrust bearing. Small springs are placed between the disks in order to facilitate their separation.

The three-speed selective gearset is bolted to the motor base by means of two arms integral with the gearset housing which pass on either side around the clutch making a unit power plant. This construction assures perfect alignment between the crankshaft, clutch and transmission shaft. Large-size roller bearings are used throughout the gearset. These are mounted in malleable iron cages to prevent them from working loose.

From the gearset, power is transmitted though a propeller shaft and two universal joints to the rear axle. The shaft is of heat-treated nickel steel. The forward end slides in the transmission universal joint, the sliding square of which is rather larger than usual.

The rear axle is of pressed steel and is of floating type. Driving gears and differential are mounted as a unit which is bolted to the axle and is easily removed without taking down the whole axle. The construction of this unit is such as to allow the adjustment of pinion and driving gear without interfering with other parts. Pinion and differential case is mounted on large roller and thrust bearings and the whole runs continuously



SIDE VIEW OF CHASSIS OF NEW HUDSON MODEL 37, SHOWING TORSION BAR

in a bath of oil. The driving shafts are made of nickel steel, oil-treated, and can be removed without disturbing any other parts of the axle. They drive the wheels through a flange bolted to the latter.

Driving pinions are made of nickel steel and hardened. A large removable plate is provided on the back of the axle for inspection, cleaning and removal. Each end of the axle carried two roller bearings on which the wheels are mounted. Strains from the end of the transmission shaft and universal joint are taken up by a torsion arm, one end of which is mounted on the axle and the other held by a double spring buffer.

Double brakes are placed on the rear wheels. There are 14 inches in diameter and 2 inch face, an increase of 2 inches in diameter over the brakes employed at present. The foot brake is external contracting and the emergency brake is external expanding. Both are lined with a special non-burnable lining.

The front axle is an I-beam drop forging which measures 2⅜ inches by 1½ inches at its smallest point. The wheel spindles are of special steel and carry large-size roller bearings on which the wheels are mounted. Two phosphor-bronze bushings are pressed in each of the spindles and reamed in place to have a bearing fit on the king bolt. The latter is $\frac{13}{16}$ inch in diameter of hardened nickel steel. The bearings are lubricated through a hole drilled through the top of the king bolt and corresponding to two grooves cut on its side. A grease cup is screwed on top of the bolt. Wear between the wheel spindle and the axle yoke is prevented by means of a hardened steel washer placed between them. Also a steel washer carrying felt on the outside is pressed on the wheel spindle in order to prevent the lubricant from working out.

Side members of the frame are pressed channel steel, the section of the channel is 4 inches high, 3¼ inches deep and $\frac{3}{32}$ inch thick. They are narrowed in front in order to permit a greater angularity of the wheels so that the car may be turned in a circle of smaller diameter than is possible with an average car of this wheelbase. A drop of 4½ inches is made on the rear of the frame.

All four springs are made flexible by the use of a large number of thin leaves; these leaves are tongued and grooved to prevent their working sideways over each other and phosphor bronze bushings are provided in the spring eyes to prevent squeaking. The front springs are semi-elliptic, 37 inches long by 2 inches wide and the rear springs are three-quarter elliptic, 50 inches long by 2 inches in width. Steering is taken care of by what is known as a non-reversible type of gear, that is, a worm and gear combination. The worm gear, which is integral with the shaft, is a full circle and not a segment.

Demountable rims are fitted with 36 by 4-inch tires. The wheelbase is 118 inches.

The gasoline tank is placed on the rear of the frame and is held in place by two leather-lined brackets. A magnetic gasoline gauge is placed on the tank, showing at all times the amount of fuel in it.

The lighting equipment consists of electric headlights, sidelights, tail lamp and dash lamp with an extension light which may be plugged in at various points on the car for night work. All lamps can be lighted directly from the generator or from the storage battery. The dash lamp is in series with the tail lamp and acts as a telltale on the latter.

Bodies supplied on this four-cylinder Hudson chassis include a five-passenger touring car, five-passenger torpedo, two-passenger roadster, a limousine and a coupe. The care that is taken to insure comfort in riding is shown by the fact that 12-inch upholstery is used.

BRAKE AND SUSPENSION FEATURES OF HUDSON

The Motor Car Repair Shop

Tuning Up the Car

Ignition System Inspection

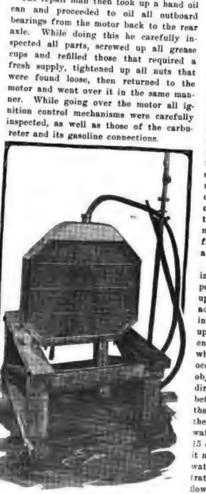
BY tuning up a car is meant the making of such adjustments as are required to put it in good running condition and applying oil to all working mechanisms so that they lustrate, a motorist once brought his car into a repair shop to have it tuned up. There was nothing radically wrong with it except that the motor seemed to have lost power. The car was a new one, having been obtained from the factory a couple of months before and it had been running beautifully up to within the last couple of days. The first thing the repair man did was to test the compression of the motor by cranking it slowly. He pronounced the compression to be only fairly good. The storage battery was then inquired about and the owner told him that it had been run down for several days and was now being recharged, but that the engine had run just as well on the dry cells as on the storage battery. The repair man cautioned the motorist in regard to the folly of allowing his storage battery to become so completely discharged. He further advised that the valves be ground in, that the lubricating oil in the circulating system of the motor be changed and the dry cells replaced with a fresh set. "All that your car needs," he said, "is a little tuning up."

The car was then left with the repair man with instructions to restore to the motor its power. Consequently the valves were ground in, the operation proving a simple one as they had not been neglected to such an extent as to become badly pitted. The lower portion of the engine case next was removed and the black, dirty oil, together with the sediment contained in the case, cleaned out with gasoline; a squirt gun and gasoline being employed to clean out the corners and such parts that could not be reached with a brush. Kerosene was employed in the squirt gun to cleanse the internal working parts in the upper portion of the case; and the bottom section then was replaced and refilled.

A fresh set of dry cells was next put into the car, and all connections securely made and arranged so that there would be no danger of their coming in contact with one another or the sides of the metal battery box. Some old rubber matting that had been lying around the shop was cut so as to form a lining for the box; and as an added precaution, the contact points of the coil were carefully examined, adjusted and cleaned, while the wire connections of the coil also were examined and the loose ones tightened. The spark plugs then were removed and cleaned and the sparking points adjusted where adjustment was required. The high-tension cables from the coils to the plugs were inspected to insure that they were not touching some metal portion of the engine where damage to the installation might occur, and the low-tension wiring was carefully inspected and all connections between the timer, coil and batteries tested and tightened. The timer cover was removed and the internal parts cleaned up and oiled; then the cover was replaced and tape was wrapped around all portions of the wires that were apt to be damaged by contact with the engine.

A general cleaning up of the outside fittings of the motor was the next operation and at the same time as each part was freed from its accumulation of grease, dust or dirt, a watchful eye was kept on the lookout for loose nuts, etc.

The repair man then took up a hand oil can and proceeded to oil all outboard bearings from the motor back to the rear axle. While doing this he carefully inspected all parts, screwed up all grease cups and refilled those that required a fresh supply, tightened up all nuts that were found loose, then returned to the motor and went over it in the same manner. While going over the motor all ignition control mechanisms were carefully inspected, as well as those of the carbureter and its gasoline connections.



FLUSHING OUT RADIATOR

The motor then was started and after letting it run for about 5 minutes, until it became thoroughly warm, and watching its operation during this time for any irregularities or disposition to overheat, the repair man then shut it down and inspected the space between the pushrods and valve stems. This was first done by testing the compression to see if any of the cylinders were particularly weak. It often happens that after a valve has been ground in, the end of its stem is brought into such close contact with the valve tappet or pushrod that when the motor becomes warm and elongation of the valve stems takes place, the valves will not be permitted to seat tightly. Adjustment of the valve tappets therefore is necessary. On old cars where non-adjustable valve tappets are employed it generally is necessary to file or grind off the end of the valve stems, but where adjustments are provided one has but to loosen the lock nut on the valve tappet and adjust the stud so that about 1-32 inch space exists between the tappet and the stem when the motor is cold.

Flush Out the Radiator

In the Locomobile repair shop, Chicago, it is customary to flush out the radiators of all cars which come into the shop for an overhauling. This is done, not because the radiator may be in need of this flushing out, but on general principles. It is a well-known fact that the operators of motor cars are not always as careful as they should be in replenishing the water supply of the radiator, consequently accumulations of dirt and sediment therein often occur which give rise to overheating and other troubles, due thereto. It is well therefore, for all repair shops to provide means of flushing out all radiators taken from motor cars that are disassembled for an overhauling.

The equipment required consists simply in a rack of some sort on which to support a radiator over the washrack in its upright or an upsidedown position. It is advisable to start flushing a radiator while inverted; that is, with the radiator turned upsidedown, and the water from the hose entering in the opposite direction from which it usually enters when the radiator occupies its usual place on the car. The object of this is to loosen up particles of dirt and scale that may be jammed in between the tubes or cells in such a way that only a reversed flow of water through the radiator will loosen them. After the water has flowed through the radiator for 15 or 20 minutes in the reversed direction it may be placed upright on its stand, the water hose applied as shown in the illustration and a stream of water allowed to flow through it in the regular way for an hour or two.

1913 R. C. H. Features Equipment

CENTER CONTROL OF R. C. H.

NEW R. C. H. FIVE-PASSENGER TOURING CAR

COMPLETE equipment seems to be the keynote of the R. C. H. for 1913. With the exception of a fuller line of accessories the only change in the offering for the new season is the discontinuation of a self-starter as stock equipment. Inasmuch as the equipment is a feature for next year it will be mentioned first. R. C. H. cars are sold with the following accessories: Electric lights with 100-ampere-hour battery, Jiffy curtains, Bosch magneto, demountable rims, extra rim and holder, rear-view mirror, top and cover, windshield and the ordinary standard touring equipment.

The only mechanical changes which the new car shows are the placing of a hand-throttle lever and spark lever on the steering column just below the wheel and the addition of a hand-lever emergency brake in place of the former foot emergency brake. In the previous cars, two foot brake pedals were used, one being the clutch and service brake combined, while the other operated the rear brake drums. The service brake operates on the transmission as in the earlier model, but it is now a seperate pedal, while the lever replaces the other pedal to bring the emergency hub brakes into play when needed for an unusually quick stop.

Long-Stroke Motor

Mechanically, the car is the same in respects as this year's product. No change whatever has been made in the four-cylinder, monobloc motor. The motor is of the long-stroke design, its bore being 3¼ inches and stroke 5 inches giving it a stroke bore ratio greater than 1.5 to 1. The cylinders are cast en bloc and timing gears and valves are all inclosed, making them neat, clean and quiet.

The crankshaft is mounted on two bearings—one at either end, which is in keeping with the general compact construction of the power plant. The motor is mounted in the frame of the car on the three-point suspension principle, there being a support at either side of the crankcase in front and one in the center in the rear. The valve rods and springs are all inclosed by an easily-removable coverplate, while the timing gears are housed by plates fastened with cap screws.

Inclosed Valves

Valves are all on one side so that there is smaller combustion space and less loss of heat to water jacket. Valve seats are nickel steel and stems of carbon steel. Intake and outlet pipes are especially large. Dynamometer tests have been made, it is claimed, with exhaust manifold, pipe and muffler in place, and also with them removed and no difference in horsepower was found, showing the exhaust passage free from back pressure. The exhaust pipe is cast separately, making it independent of cooling system. Cast integral with cylinders would mean water cooling on one side at least, making water absorb extra heat and tending to over-heat. The crankshaft is 1⅞-inch diameter on the main and connecting rod bearings. Bearings are unusually large for motor of this size.

Barrel-Type Crankcase

The crankcase is of the barrel type, and is oil-tight. There are no bolts to loosen and bearings cannot get out of line. Removable plates make inspection and connecting rod-adjustment easy.

There are no batteries or coils in the R. C. H. ignition system. The Bosch magneto carried at left side of motor and driven from magneto gear in forward

R. C. H. MOTOR SHOWING VALVE HOUSING AND AMPLE CRANKCASE ACCESS

No Mechanical Changes for Next Season

housing forms the single source of ignition current.

Cooling is by the thermo-syphon system, an extra large radiator with supplementary tank giving water capacity of 3½ gallons. This does away with fan and pump.

Lubrication Features

Lubrication is a constant level splash system, the same oil up or down hill. The under sections of connecting rods are fitted with scoops which dip into the metal troughs which regulate height of the oil. The amount of oil is regulated by upper and lower level pet cocks and crank case. A splash wheel into reservoir, is the only working part.

The carbureter employed is the B-D standard. It has only two adjustments. It is placed on the opposite side of the motor from the magneto, reducing chance of firing the gasoline and allowing gas to heat while between the cylinders. Hot air is supplied from between cylinders.

MOUNTING OF R. C. H. GEARSET CONTROL

The cone clutch is leather faced, engaging in the flywheel which is fan-spoked. The clutch is 1¾ inches wide, 11½ inches in diameter.

Final drive from clutch to gearset is through two grease-tight universal joints and a propellershaft 1⅛ inches in diameter. The clutch joint is adjustable for wear. The propellershaft housing serves as a torque tube and is braced by steel rods reaching to the rear axles. All driving strains are taken through this tube, the ball joints permit of free and smooth action.

The R. C. H. transmission gearset is of the sliding gear selective type, and has three speeds. It is located on the rear axle. This position reduces the angle of shaft from clutch to rear axle. The differential is of the bevel gear type with four bevel pinions. The spider is forged solid, ground on the bearing surfaces and is formed of chrome-nickel steel. The bevel pinion is solid with shaft and the meshing with the bevel gear is adjustable. The pinion has twelve teeth, bevel fifty-one teeth, affording 4.25 reduction. The rear axle is of the semi-floating type. Full adjustment of both bevels can be made by removing the plates on rear axle and gearset housings.

Left-Hand Drive

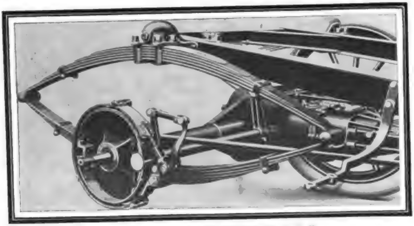
R. C. H. cars are driven from the left side, and gears are shifted by a center lever operated through an H-plate convenient to the driver's right hand. The steering gear is of the irreversible worm type, unaffected by irregularities of road. The gear is easily removable for adjustment, a feature that saves much money at the repair shop. The 16-inch steering wheel is one piece, with no cracks to open and become unsightly. Spark and throttle control are on the steering column and in addition there is a foot-operated accelerator.

Brakes include a hand-lever emergency brake at driver's right operating at the right of H-plate. The service brake is operated by right foot. This gives two complete sets of brakes on the car. Brake equalizers cut down liability of skidding and give equal wear on tires.

The front axle is one-piece I-beam, drop forged. The front springs are semi-elliptic; rear springs are elliptic and are mounted on swivel seats and slightly uptilted. The swivelled springs do away with strains on the frame and the tilt means that in hitting a bump the shock is taken at right angles, giving an easier riding car. The frame of pressed steel with five cross members hot riveted in place.

Tires are 32x3½ inches in size and the wheelbase is 110 inches and the road clear-

PLAN VIEW OF CHASSIS SHOWING REAR AXLE, GEARSET AND BRAKE EQUALIZERS



REAR SUSPENSION AND BRAKES OF R. C. H.

ance is 10½ inches. The weight of the touring car is 2,000 pounds and of the roadster 1,800 pounds.

As to body design, this $900 touring car presents a decidedly foreign light-car and sweeping lines. The cowl has a low slope which is set off by the same windshield as when the car made its debut. The door handles are all inclosed, while, except for the battery box, the running boards are clear. The interior of the car has been designed to give the maximum of leg room consistent with the wheelbase of 110 inches. Seats are set at a comfortable angle, which the designers have deemed most restful for all occasions on the road.

The lamps used on the 1913 R. C. H. are all of the bullet type. The headlights are 12 inches in diameter, fitted with 16 candle-power bulbs and double parabolic lens; side lamps 6 inches in diameter with 4 candle-power bulb and parabolic lens, and the tail lamp 4 inches in diameter with 2 candle-power bulb. Ediswan sockets are used throughout. On the headlights the parabola is set into the body of the lamp, allowing easy access to bulbs and focusing device, and permitting of the cleaning of parabola or glass in the door without the removal of screws or other holding devices. Current is supplied by 100 ampere-hour storage battery, carried in a battery case on the running board. The specification of non-skid tires is also an innovation in low-priced cars.

The two-passenger roadster is continued in two models, the standard and the EE types. The former, selling at $700 has head lamps, oil side and tail lights, 30 by 3-inch tires on clincher rims, gas generator, top and Jiffy curtains and horn as its regular equipment, while the EE model, which is to cost $750, has the same equipment except that a Prest-O-Lite tank takes the place of the generator and 32 by 3½ inch tires on demountable rims are substituted for the 30 by 3-inch tire equipment. In all other respects, these roadster models retain the mechanical construction as outlined for the touring car.

The Motorists' Bookman

The Land of Heart's Desire

"CANADA; The Golden Land," written by Arthur E. Copping and illustrated by Harold Copping, is a simple sketch of the populating of Canada's great northwest, and more or less of an exploitation of the efforts of the Canadian Pacific Railway in this direction. It reads like a story of dreams come true, when from a beginning with nothing a man may in 2 years' time possess 160 acres of finely productive land, with the necessary equipment for its cultivation, a shelter and sustenance, and the third year start a bank account. The writer has pictured the healthful simplicity of this broad, fair country, the content and prosperity of its people, and yet withal, the tale is so extremely simple one feels he has scarcely measured up to his subject. In some of the illustrations, in color, the atmosphere of the country is well conveyed. Published by George H. Doran Co., New York. Price, $1.50.

Details of European Travel

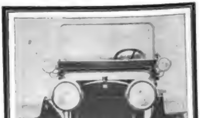
It is fundamentally necessary when traveling to study timetables and guide books; it is interesting and profitable to become familiar with the objects of virtu or historical value in the places visited; but it is decidedly comfortable to learn beforehand what to look for and how to meet the little, ordinary, intimate experiences of daily life amongst a foreign people. Just such information has Blanch McManus given in "An American Woman Abroad." A couple of hours with this book is like an evening's visit with an observant friend whose power of recital is equal to his perception. Conditions to be met in housekeeping, modes of marketing and what may be procured, servants and the cost of living in the different countries—phases that will hold the attention of one contemplating living abroad—are each given a chapter. For the woman traveler who is doing Europe after one fashion or another, the various hostelries are discussed to her profit. The—to many—perplexing subject of tips is advantageously handled, while shopping, the cafes, and the social side are fully presented. All of which is interesting to one traveling by public conveyance or his own motor car, and some suggestions especially for the motorist are introduced. A chapter each is devoted to the admirable work of the Touring Club of France, and French law for foreigners. The book is cleverly illustrated by the author, and wears a charming dress. Published by Dodd, Mead & Co., New York.

Motor Encyclopedia

The latest edition of the "Cyclopedia of Automobile Engineering," appears in four volumes, containing more than 1,600 pages and illustrated with over a 1,000 engravings. It is intended for general reference on the construction, operation, and care of gasoline, electric, and steam motor cars, commercial vehicles, motorcycles, and motor boats, treating extensively of types of motor cars; driving, garages, repairs, and aeronautics.

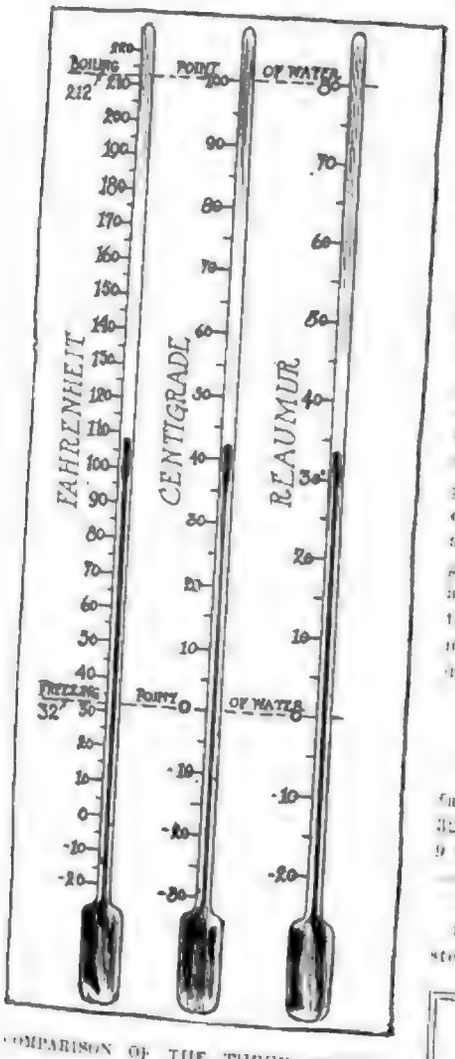
Unlike most encyclopedias, it is absorbingly interesting. Charts and diagrams are made extensive use of, the matter being composed, and explanations being made, with thoroughness, and simplicity. This is largely accounted for by the fact that much of the material in its original form, was prepared for instruction by correspondence. The work is replete with ingenious means of bringing the ideas closer to the readers' understanding, by means of frequent allusions to familiar experiences of everyday life, and by extensive review questions.

The work seems admirably adapted for use as a text, and at the same time is so completely indexed, that it should make a convenient reference work, while the glossary adapted to ready reference constitutes a veritable unabridged of motor terms. Published by American School of Correspondence, Chicago; Price $12.80.



FRONT VIEW OF R. C. H. CAR

The Mathematics of Motoring



COMPARISON OF THE THREE COMMON THERMOMETERS

TWO thermometer scales are in general use in the United States: Fahrenheit and centigrade. In the fahrenheit thermometer the temperature of melting ice is taken at 32 degrees and boiling point of water at 212 degrees; thus there are 180 degrees between the two extremes. In the centigrade thermometer the distance between these two points on the scale is divided into exactly 100 degrees. In order to convert degrees fahrenheit into degrees centigrade: Subtract 32, multiply the remainder by 5, and divide by 9. Thus, convert 59 degrees fahrenheit to degrees centigrade:

$$\text{Then } (59 - 32) \times \frac{5}{9} = 15^\circ \text{ centigrade.}$$

Or to convert degrees centigrade into degrees fahrenheit: Multiply by 9, divide by 5 and add 32. Thus, convert 40 degrees centigrade into degrees fahrenheit:

Thermometer Scales

$$\text{Then } (40 \times \frac{9}{5}) + 32 = 104^\circ \text{ fahrenheit.}$$

Following is a table giving the equivalent degrees of the fahrenheit and centigrade scales, from 1 to 100 centigrade.

The reaumur thermometer is not encountered often in America, but is used to some extent in Europe. In the reaumur scale the fixed points are the same as on the centigrade scale, that is, the freezing point and boiling point of water, but the distance between them is divided into 80 degrees instead of 100. That is to say, 80 degrees reaumur are equal to 100 degrees centigrade, and 1 degree centigrade equals 80/100 or 4/5 of a degree reaumur and 1 degree reaumur equals 5/4 of a degree centigrade. Consequently, to convert any number of degrees reaumur into centigrade degrees, it is merely necessary to multiply them by 5/4. For example, 16 degrees reaumur is

$$\frac{5 \times 16}{4} \text{ or } 20 \text{ degrees centigrade.}$$

To convert degrees reaumur into degrees fahrenheit, multiply them by 9/4 and add 32. For example, 16 degrees reaumur is

$$\frac{9 \times 16}{4} + 32 \text{ or } 36 + 32 \text{ equals } 68 \text{ degrees fahrenheit.}$$

Since the distance on the thermometer stem between boiling point and freezing point of water is divided into 180, 100 and 80 equal points respectively on the fahrenheit, centigrade, and reaumur scales, it is clear that 9 degrees fahrenheit, equals 5 degrees centigrade equals 4 degrees reaumur. Hence, since in the two latter scales the graduations begin from the freezing point and on the fahrenheit scale from a point 32 degrees below the freezing point, if F, C and R represent the same temperature on the different scales.

$$\frac{C}{5} = \frac{R}{4} = \frac{F - 32}{9}$$

Recapitulating.

To convert degrees, centigrade or reaumur, into degrees fahrenheit:

Let F = No. of degrees fahrenheit.
C = No. of degrees centigrade
R = No. of degrees reaumur

$$F = \frac{9C}{5} + 32;$$

$$F = \frac{9R}{4} + 32;$$

$$C = \frac{5(F - 32)}{9}$$

$$R = \frac{4(F - 32)}{9}$$

Freezing point, or 32° F. = zero in centigrade or reaumur.

Boiling point, or 212° F. = 100° centigrade or 80° reaumur.

EQUIVALENT TEMPERATURES ON CENTRIGRADE AND FAHRENHEIT THERMOMETER SCALES

Cent.	Fahr.	Cent.	Fahr.	Cent.	Fahr.
0	*32.0	34	93.2		
1	33.8	35	95.0	68	154.4
2	35.6	36	96.8	69	156.2
3	37.4	37	98.6	70	158.0
4	39.2	38	100.4	71	159.8
5	41.0	39	102.2	72	161.6
6	42.8	40	104.0	73	163.4
7	44.6	41	105.8	74	165.2
8	46.4	42	107.6	75	167.0
9	48.2	43	109.4	76	168.8
10	50.0	44	111.2	77	170.6
11	51.8	45	113.0	78	172.4
12	53.6	46	114.8	79	174.2
13	55.4	47	116.6	80	176.0
14	57.2	48	118.4	81	177.8
15	59.0	49	120.2	82	179.6
16	60.8	50	122.0	83	181.4
17	62.6	51	123.8	84	183.2
18	64.4	52	125.6	85	185.0
19	66.2	53	127.4	86	186.8
20	68.0	54	129.2	87	188.6
21	69.8	55	131.0	88	190.4
22	71.6	56	132.8	89	192.2
23	73.4	57	134.6	90	194.0
24	75.2	58	136.4	91	195.8
25	77.0	59	138.2	92	197.6
26	78.8	60	140.0	93	199.4
27	80.6	61	141.8	94	201.2
28	82.4	62	143.6	95	203.0
29	84.2	63	145.4	96	204.8
30	86.0	64	147.2	97	206.6
31	87.8	65	149.0	98	208.4
32	89.6	66	150.8	99	210.2
33	91.4	67	152.6	100	*212.0

*Freezing point. *Boiling point.

Current Motor Car Patents

PATENTS ISSUED JUNE 25, 1912.

1,030,314—Spring Wheel. Alvin R. McEntrie, Folsom, Ga. Filed February 15, 1912. Serial No. 677,681.

1,030,343—Carbureter. Nathaniel C. Stamps, Ocean Park, Cal. Filed February 13, 1911. Serial No. 608,392.

1,030,347—Exhaust Silencer. Zachariah Swearingen, Osceola, Ia. Filed January 27, 1912. Serial No. 673,791.

1,030,348—Protective Covering for Pneumatic Tired Wheels. Lewis J. Tetlow, West Springfield, Mass. Filed July 14, 1911. Serial No. 638,517.

1,030,373—Clutch Mechanism. Frank B. Allen, Salt Lake City, Utah. Filed May 15, 1911. Serial No. 627,354.

1,030,379—Transmission Gearing. Andrew Benson, Chicago, assignor by mesne assignments to Benson Gear Co. Filed September 5, 1911. Serial No. 647,623.

1,030,388—Motive-Fluid Mixer for Internal Combustion Engines. William G. Cross, Seneca Falls, N. Y. Filed October 24, 1908. Serial No. 459,333.

1,030,400—Cage for Roller Bearings. Chester A. Heinzelman, Belleville, Ill. Filed July 25, 1911. Serial No. 640,436.

1,030,401—Roller Bearings. Chester Arthur Heinzelman, Belleville, Ill. Filed November 6, 1911. Serial No. 658,793.

1,030,413—Electric Ignition Device. Joseph J. Lombardi, New York. Filed October 26, 1907. Serial No. 399,262.

1,030,442—Spring-Wheel. John Henry Weldon, Comanche, Okla., assignor of one-half to Charles Sam Wade, Comanche, Okla. Filed June 5, 1911. Serial No. 631,209.

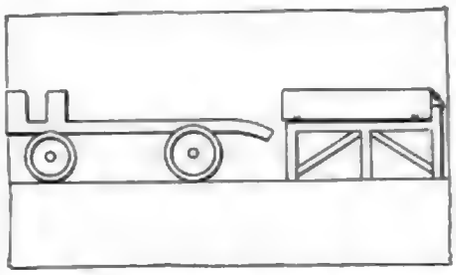


FIG. 2—CRATE FOR LOADING TRUCKS

1,030,463—Fluid Clutch. Guy G. Crane, Rockford, Ill. Filed December 14, 1911. Serial No. 665,635.

1,030,537—Vehicle Tire. Lewis Quintal, Cleveland, O. Filed September 21, 1910. Serial No. 583,063.

1,030,539—Motor Car Stay Strap. George E. Robinson, Medford, Ore. Filed April 27, 1911. Serial No. 623,705.

1,030,583—Self Starter for Motor Cars. Frederick G. S. Hewitt, Detroit, Mich. Filed May 8, 1911. Serial No. 625,699.

1,030,610—Vehicle Wheel. Augustus F. Priest, Chicago. Filed March 17, 1911. Serial No. 615,036.

1,030,686—Gearing for Motor-Driven Plows. Edmond B. Sellard, Mexico, Mo. Filed June 9, 1910. Serial No. 565,925.

1,030,687. Gang and Motor Plow. Edmond B. Sellard, Mexico, Mo. Original application filed June 9, 1910. Serial No. 565,925. Divided and this application filed October 4, 1910. Serial No. 585,181.

1,030,688—Spring Wheel. Herman M. Strawn, Marysville, Cal. Filed May 25, 1911. Serial No. 629,379.

1,030,716—Detachable Wheel Rim. Joe J. Burney, Shreveport, La. Filed December 19, 1911. Serial No. 666,698.

1,030,735—Motor Wagon—Henry M. Kinney, Winona, Minn., assignor to Winona Wagon Co., Winona, Minn. Filed August 12, 1911. Serial No. 643,764.

1,030,793—Steering Gear for Vehicles. Henry Schumacher, Buffalo, N. Y. Filed August 12, 1911. Serial No. 643,699.

1,030,799—Starting Mechanism for Internal Combustion Engines. John L. Barker, Racine, Wis., and Frederic A. Barker, Toledo, O. Filed May 25, 1911. Serial No. 629,462.

1,030,806 — Internal Combustion Engine. Charles Lee Cook, Louisville, Ky. Filed September 17, 1910. Serial No. 582,510.

1,030,809—Resilient Vehicle Tire. Era M. Green, San Diego, Cal. Filed April 17, 1911. Serial No. 621,585.

AUTOMATIC Motor Car Jack—No. 1,030,728. Charles A. Hart, Findlay, O., dated July 25, filed January 18, 1912—The diagram, Fig. 3, shows an automatic jack which comprises two vertical legs, bolted to a frame, having two standards at an angle to one another, and provided with runners pivotally mounted to it, to receive the wheels of the vehicle. In use the wheels are run up the inclined runners until the axle strikes the standards, causing the whole device to rock from its inclined position to a vertical position, the lateral movement causing the wheels to run off the runners at their highest point, the standards holding the axle so that the wheels are free of the floor.

Crate for Loading Motor Trucks—No. 1,030,320. Ralph L. Morgan, Worcester, Mass., dated July 25, filed February 16, 1911—Fig. 2 illustrates a slip, into which a motor truck may be run, consisting of a U-shaped platform, slightly lower than the fixed platform of the truck; and a removable body, mounted on rollers. The body is loaded while on the platform, and is transferred to the truck chassis by backing the latter into the slip, the superior height of the truck platform raising the body clear of the loading platform. It is removed by backing the truck into the slip and fastening the body to the slip, so that the truck's leaving the slip will cause the body to slide off the truck onto the loading platform.

Three-Wheeled Chassis—No. 1,030,357 to William G. Wagenhals, Detroit, Mich., dated July 25, filed May 19, 1911. This patent relates to a motor car chassis comprising a parallel frame, narrowed at the rear to support the axle of a single driving wheel, and provided with supports for an engine sub-frame, and having steering knuckles for the two front wheels, mounted on the extremities of a cross member of the frame, which also carries the front spring seats. A step is attached to the extreme front of the chassis.

Engine-Starter—No. 1,030,430, to Judson O. Roberts, Cripple Creek, Colo, dated July 25, filed September 6, 1910.—The spring-actuated self-starter, illustrated in Fig. 5, consists of a spiral spring, mounted on a starter shaft, connected with the engine shaft; by means of two ratchet wheels, provided respectively with a revolving pawl and a stationary dog, their respective purposes being to wind the spring and to control the transmission of its stored energy to the engine shaft. The starter shaft is reciprocably mounted and equipped with a jaw clutch between the engine shaft and the driving ratchet wheel. In operation, the jaw clutch is engaged by means of a lever located convenient to the driver, which releases the stationary dog, permitting the spring to rotate the engine shaft. When the engine responds, another movement of the operating lever releases the jaw-clutch and engages the stationary dog with the driving ratchet, the rotation of the starter shaft rewinding the spring, until sufficient tension has been imparted to it to draw it away from the revolving pawl.

Wire-Spoked Rims—No. 1,030,428, to John V. Pugh, Allesley, England, dated July 25, filed March 6, 1909—This patent applies to a method of so recessing the metal rims of a wire-spoked wheel as to provide for the angle at which the spoke is to meet the rim, and to indent and puncture said rim accordingly, without substantially reducing the thickness of the metal at the edges of the holes.

New Ignition Coil—No. 1,030,288, to Willard E. Dow, Baintree, Mass, dated July 25, filed September 13, 1907—Fig. 1 represents a coil unit which is the feature of this invention. It provides contacts for

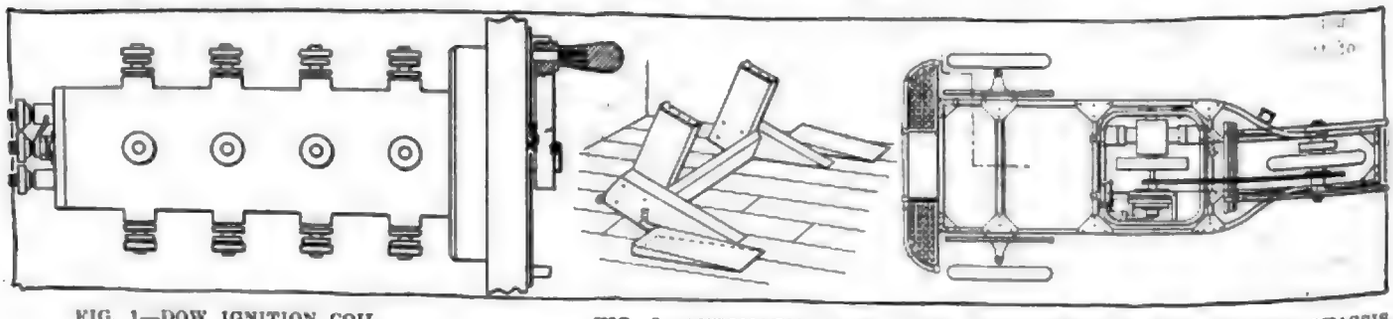


FIG. 1—DOW IGNITION COIL FIG. 3—AUTOMATIC JACK FIG. 4—WAGENHALS THREE-WHEEL CHASSIS

a double-circuit magneto, spark plugs, battery and ground, and comprises a switch by which these contacts may be severally made or broken, and having separate contacts for both primary and secondary circuits of the induction coil.

INDIAN RUBBER OUTPUT

Washington, D C., June 29—The rubber output for 1912 in the Madras presidency, India, promises to be a banner year, says the Daily Consular Reports, the custom returns showing that the export business for January alone amounted to $10,216,633 as compared with $7,828,309 for the corresponding time in 1911.

The annual reports of three South Indian concerns—the Travancore, Orkaden River, and Paloor rubber companies, which are all under the same management—show that these interests had the following acreages planted with Para rubber: Travancore, 1,038.78; Orkaden river, 734.3; Paloor, 399. The Travancore Rubber Co., harvested 29,600 pounds of rubber last year; the Orkaden River Co., 4,465 pounds; and the Paloor, nil. The estimates for this year are: Travancore, 67,000 pounds; Orkaden River, 10,000 pounds; Paloor, 6,000 to 7,000 pounds. The Rani Rubber Co. Limited, harvested 193,750 pounds of rubber last year as compared with 41,983 pounds in 1910; the estimate for the current year is 325,000 pounds of rubber; and the total for the first 4 months of this year is 25,110 pounds in contrast to 4,629 pounds in the same period in 1911. This organization has 3,054 acres planted with Para rubber.

HOLDS GARAGEMEN LIABLE

Trenton, N. J., June 29.—The supreme court recently handed down a decision definitely fixing the liability of garages for damage ensuing from accidents during unauthorized trial runs by repairmen. The decision was in favor of Albert G. Brooker, plaintiff, against the F. L. C. Martin Automobile Co., of Plainfield, N. J., defendant. The car had been left at the garage of the defendant for a complete overhauling, and upon partial completion of the job, it was taken out by a shop mechanic for a test. The steering gear failed and the car collided with a tree. The court ruled that in taking out the car without authority, the defendants were liable for any damage sustained by the car in consequence, regardless of the custom of testing without the permission of the owner.

MAY TIRE BUSINESS

Washington, D. C., July 1—The imports of india rubber in May last amounted to 9,802,830 pounds, valued at $8,918,506, as against 6,399,946 pounds, valued at $6,340,948, imported in May a year ago. The imports for the 11 months' period increased from 65,723,492 pounds, valued at $70,736,522, in 1911, to 103,395,020 pounds, valued at $87,570,396, in 1912.

May Imports and Exports

WASHINGTON, D. C., June 29—The latest returns of the federal bureau of statistics show that in May last 3,009 motor cars, valued at $2,963,818, together with parts, except tires, valued at $448,972, were exported, as against 1,466 cars, valued at $1,513,547, and parts valued at $343,879, shipped abroad during the corresponding month of last year. During the 11 months ended May the exports of cars increased from 10,249, valued at $11,262,177, in 1911, to 19,816, valued at $19,433,965, in 1912. The exports of parts, except parts, likewise rose in value from $2,219,294 to $3,745,320 during the periods under consideration.

The detailed shipments of cars for May and the 11 months ended May were as follows:

	—May, 1912— No.	Value.
Exported to—		
United Kingdom	673	465,722
France	63	48,980
Germany	49	36,719
Italy	30	25,605
Other Europe	204	155,125
Canada	1,109	1,352,856
Mexico	8	15,370
West Indies and Bermuda	29	36,237
South America	162	183,292
British Oceania	445	412,565
Asia and other Oceania	152	149,309
Other countries	85	72,038

	—Eleven Months— No.	Value.
Exported to—		
United Kingdom	5,389	4,281,487
France	507	419,816
Germany	261	190,440
Italy	169	157,852
Other Europe	1,062	870,311
Canada	5,533	6,534,088
Mexico	266	410,129
West Indies and Bermuda	299	318,618
South America	1,444	1,736,921
British Oceania	3,479	3,137,612
Asia and other Oceania	1,001	1,038,677
Other countries	406	388,014

One more motor car was imported into this country in May last than in May a year ago, the number in May, 1911, being 75, valued at $158,046, while in May last the number was 76, valued at $165,759. The imports of parts, except tires, declined in value from $47,846 in May, 1911, to $21,493 in May last. During the 11 months' period the imports of cars increased from 771, valued at $1,642,329, in 1911, to $2,033,254 in 1912, while the imports of parts decreased in value from $336,168 to $283,736. Cars were received from the following countries during the two periods.

	—May— —1911— No.	Value.	—1912— No.	Value.
Imported from—				
United Kingdom	19	$36,941	11	$28,824
France	26	62,442	41	95,965
Germany	13	26,460	5	10,114
Italy	7	12,799	11	17,424
Other countries	10	19,404	8	13,932

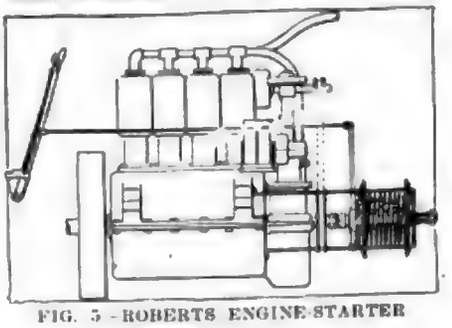


FIG. 5—ROBERTS ENGINE STARTER

	—Eleven Months— —1911— No.	Value.	—1912— No.	Value.
Imported from—				
United Kingdom	116	$265,562	181	$417,506
France	348	728,507	380	914,529
Germany	96	215,640	112	250,507
Italy	116	217,694	126	189,130
Other countries	95	214,926	121	261,582

The exports of motor car tires in May last were valued at $272,346, as against a value of $310,346 in June a year ago. However, during the 11 months' period ended May the exports increased in value from $1,838,482, in 1911, to $2,335,920 in 1912.

RATES MAKERS PAY FOR WOOD

Lansing, Mich., June 29—Of all the wood-using industries of Michigan, the makers of motor cars pay the highest price for what they use, according to a report of the wood-using industries of Michigan by H. Maxwell, expert for the public domain commission. The report says:

"They demand no wood that is not demanded by other manufacturers, but they must have the best, and high cost is the result. Twenty-six species of wood are listed, the three most largely used being white ash, hickory and yellow poplar. The cheapest of the twenty-six species costs more than $20 a thousand, while three of them cost more than $100 a thousand; these being black walnut, mahogany and Circassian walnut, the latter being $345 a thousand. The strong, stiff woods are made into frames; hickory goes principally into wheels; much of the interior of the bodies is of elm, while the fine, handsome woods are used for finish for tops and bodies. A fine motor car requires a rather large amount of expensive wood for finish in the windshield frame, the panels of the body, the steering wheel and other parts and trimmings. The wood finisher does his best work on this class of output. More than two-thirds of the motor car wood is not grown in the state, and the home product is cheaper. Its average cost is $52.81, while that brought from elsewhere is $59.56."

MILLIONS FOR TRUNK LINES

Tacoma, Wash., June 29—Ten million dollars will be spent in the state of Washington completing three trunk lines of a total length of 1,000 miles, under the direction of the Washington Good Roads Association, as follows:

Sunset highway—From the Idaho state line at the eastern terminus of the Apple way, through Spokane, Davenport, Wilbur, Wenatchee and Snoqualmie pass to Puget sound, 400 miles.

Inland Empire highway—From Spokane to Rosalia, thence through the most feasible routes to Whitman, Garfield and Walla Walla counties to the city of Walla Walla, across the Columbia river at or near Pasco, North Yakima, and thence to the junction at Ellensburg with the Sunset highway.

Pacific highway—From Blaine through Bellingham, Everitt, Seattle, Tacoma, Olympia, Chehalis and Kalama to Vancouver, 350 miles.

From the

LOWELL Traffic Regulations—Street traffic rules have been adopted by the Lowell, Mass., city officials similar to the regulations in use in Boston and other cities designed to improve conditions.

Iowa Road Decision—County motor vehicle funds may be used for the dragging of roads with drags, according to a decision of the Iowa department of justice last week. The question was raised as to whether the county motor vehicle fund can be used for temporary roads or whether the law contemplates that it shall be used for permanent road improvements after surveys have been made.

Atlanta Meet Idea Abandoned—The Atlanta Automobile and Accessory Association has about decided to give up its attempt to hold a meeting this summer on the Atlanta speedway. A canvass of the situation demonstrated that a good entry list could be secured, but the scheme went on the rocks when the enormous cost of putting the track surface in condition was learned.

Panama Adopts Traffic Laws—Laws governing motor traffic have just been enacted in Panama City. Within the city the speed limit is fixed at 15 miles per hour, but cars must be under instant control at the intersection of all streets. A license charge also has been arranged. Pleasure cars are required to pay $4 per year, while commercial vehicles are assessed $7.50 per year. There are sixty-three motor-driven vehicles in Panama City.

Milwaukee Fixing Streets—After 5 years of practically absolute neglect of asphalt pavements, of which Milwaukee has more than 100 miles, it has been found that the portable repair plant, while highly efficient and economical, could hardly accomplish half the work necessary, and therefore another will be added. The principal streets are now being repaired rapidly and by the middle of August it is expected that every mile of asphalt pavement in Milwaukee will have been placed in as good as new condition.

Fights for Universal Lights—The universal light ordinance proposed for the city of Milwaukee by the Milwaukee Automobile Club, and recommended for adoption by the committee on judiciary, has been amended to apply only to moving vehicles, as there is at present an ordinance in Milwaukee which provides that any vehicle left standing on a street or in an alley must be marked by at least one light visible in both directions. The club endeavored to have its ordinance passed, and the old ordinance abolished, to avoid superfluity and make the ordinances relating to the subject more compact. However, there was danger of losing both ordinances, so the club decided to let well enough alone and have two ordinances to cover the ground which one good statute would cover. The M. A. C., acting with the Wisconsin State A. A., will endeavor to push a universal light law through the next session of the Wisconsin legislature, convening in January, 1913.

This Is a Practical Club—Every motor car owner in Polk county, Iowa, is to be enrolled as a member of the Polk County Good Roads Club which was formed last week. Membership costs $2, all of which goes to the purchase of gravel for the roads of the county. Already plans have been made for the graveling of two mains roads of the county.

Ohio Will Use Convicts—After considerable controversy and searching for the statutes of the state, the Ohio board of administration has arranged for the use of convicts upon two road improvements in Carroll county, Ohio. The state is donating the labor of the convicts and the counties have to house and subsist them. The action of the state board will work a saving of from 15 to 20 per cent in the cost of road building.

Swiss More Lenient—The authorities of the Swiss canton of Valais now permit motor cars to cross the Alpine road over the Simplon pass by daylight, night crossing being strictly forbidden. This will be welcome news to the foreign tourists. The road leads from Brigue in the Rhone valley to Domo d'Ossola in Italy. The trip can now be made in 2½ hours instead of half a day as formerly, says Consul F. B. Keene, of Geneva, but a special permit must first be secured from the Brigue police.

Trying Tannic Acid on Roads—It is announced that experiments in treating Canadian roads with a solution of tannic acid will be conducted by W. A. McLean, provincial engineer of highways, during the coming spring and summer. It has been recommended to the provincial roads department that this treatment will give a wonderfully hardened surface of clay, rendering it tough and rubbery, and surface that will last well, and not be readily softened by even persistent rainfalls. It will also keep down dust.

Building King's Highway—Although progress on the construction of King Edward highway from Montreal to Rouse's Point, N. Y., has been retarded through scarcity of labor, quite a lot of preliminary work has already been accomplished. The route, which will shorten the distance from Longueuil to the state of New York by 12 miles, has been traced and stone-crushing machinery set up at intervals with plenty of stone ready to hand. Equipment in operation or nearly so consists of forty stone wagons, eleven stone crushers, seven engines, thirteen graders and seven watering carts. Six thousand dollars per mile is the estimate for construction so that the total cost of the 40 miles of road should not exceed $250,000. It will be macadam throughout its entire length, a waterproof coating of tar and sand at certain points.

Vancouver an Applicant—The Vancouver Automobile Club of Vancouver, B. C., has formally asked the Pacific Highway Association to hold its fourth annual convention for 1913 in the metropolis of western Canada.

Dawson on Vaudeville Stage—Joe Dawson, winner of the 500-mile race at the Indianapolis motor speedway Memorial Day, is to be starred on a vaudeville circuit as "The Man in the Car," and a part of his turn will be an exhibition of the National No. 8 in which he won the race. C. E. Shuart, publicity manager of the Indianapolis motor speedway, will accompany Dawson on the trip, which will extend through several months.

Planning a Lake Shore Drive—Unless unforeseen circumstances prevent it, a permanent paved roadway will in the near future be constructed along the lake shore between Toronto and Hamilton, Ont., as a result of the agitation which came to a head when a conference of the good roads association, representatives of the councils of the two cities, the wardens of the counties affected, and others, passed a resolution endorsing the scheme enthusiastically.

Tour Helps American Cars—The tour around Sicily last May, in which three American cars, the Ford, Overland and Metz, participated, brought out particularly well the stanchness and durability of the American-made cars, according to the consular trade reports. The little 20-horsepower Ford came in sixth, and the Overland, though delayed through frequent changing of tires, went over the bad roads without loosening a screw or breaking a spring. The durability of the American cars attracted much attention and Consul Hernado de Soto, Palmero, claims it will increase the sale of American cars in the island.

Milliners Blame Motor Car—The modern motor car, with its attendant veil, donned by women motorists, because of damage the wind does to hats, is responsible for the falling off of trade in the millinery line, according to A. O. Niedlander, of Indianapolis, president of the Millinery Traveling Men's Association. The statement was incorporated in the annual report of the president of the association, which was read at the opening session of the convention in Louisville last week. Women who ride in cars are prone to wear hats and affect veils, explained Mr. Niedlander, thereby curtailing the demand for feminine headgear. He also declared that there is less

Four Winds

demand for wearing apparel of all kinds pertaining to home life. All this was laid to the door of the motor car and extravagance.

To Be Done By October—The provincial government expects that the King Edward highway, or the reconstructed road from Longueuil, Canada, to the intercolonial boundary at Rouses' Point, will be completed before October.

Synan on Highway Commission—Governor Foss has at last filled the position on the Massachusetts highway commission made vacant last October when Chairman Harold Parker resigned by appointing James W. Synan, of Pittsfield to the place.

Many Help Build Roads—In 24 hours 24 miles of the Meridian road were completed by citizens through the Codington county, S. D., section. One thousand men were formed into twenty-four committees, each purchasing a shovel to supplant the work of teams and tractors and twelve drags.

Philadelphia to Buy Cars—Out of the present municipal loan of $4,225,000 being floated by the city of Philadelphia $35,000 will be available for the purchase of motor-driven fire apparatus. Bids will be opened on July 8 for seven cars to be furnished the chief engineer, assistant chief and five district engineers; six runabouts for district engineers; a tractor for a water tower and an aerial hook and ladder truck.

Stirring Up Kentucky—The Southeastern Kentucky Good Roads Association, which met in Barbourville last week, will continue a vigorous campaign toward stirring up the sentiment for improved highways in the mountain section of the Bluegrass state. An election has been called for Bell county, where a $400,000 issue will be voted upon this fall. The fiscal court of Whitley county has taken steps toward calling an election to determine the sentiment of the people for bettering the roads through a bond issue.

Rambler Makers Contribute — The Thomas B. Jeffery Co. of Kenosha, Wis., manufacturing the Rambler car, has donated $1,000 to the fund of $6,000 now being raised by the Kenosha Automobile Club for the improvement of the Lake Shore road within Kenosha county. The club is working under a provision of the new highway law of Wisconsin which makes it compulsory for townships, the smallest unit of government, to raise a sum equal to that provided by any individual or individuals, for the improvement of any stated portion of any highway. The club has selected the Lake Shore road for improvement and intends to force the expenditure of $18,000 on the highway by providing $6,000, obliging the township to provide $6,000, the $6,000 to be duplicated by county and state aid.

Redwood Club Will Have Tour—Dr. E. A. Lyman, secretary of the Automobile Club of Redwood Falls, Minn., has completed the itinerary for the second annual sociability and reliability run of the club, July 12-15. The trip will be about 400 miles. Twenty-five cars and 100 individuals will take part.

Illinois Bankers Demand Roads—Illinois bankers attending the annual convention of group 1, Illinois State Bankers' convention, in Moline last week went squarely on record in favor of systematic road improvement, to be brought about by co-operation between inhabitants of the agricultural and commercial sections.

Denver Does More Sign Posting—Supplementing the posting of many roads out of Denver accomplished last year, the Denver Motor Club has just completed the posting of the Denver to Limon and the Denver to Julesburg roads in Eastern Colorado. The task of marking the Denver to Laramie and Denver to Cheyenne, Wyo., roads will be undertaken at once.

Marking Waubonsie Trail—The route of the Waubonsie trail through central Illinois is partially marked. A painter has been engaged during the past 2 weeks in painting the poles through Macon county, showing the designating marks of the trail association. The trail is now completely marked from Denver, Col., as far east as Monticello, Ill., and will be pushed east to Danville and Indianapolis as soon as possible.

Minnesota Trying Concrete—Concrete as road building material has come to the fore in Minnesota in the last week. Beside the action of Winona county in throwing out macadam bids and re-advertising for concrete the state highway commission has become impressed with the value of the material. It is to be tested out in Steele county and in Hennepin county, also on one of the Minneapolis streets.

Push Spokane Glacier Road—The Spokane-Glacier park division of the Park-to-Park road to be completed October 1, according to plans formed at a meeting at Libby, Mont., with delegates from all points and commissioners from Bonner, Flathead and Lincoln counties. The tentative route is through Spokane, Newport, Priest River, Laclede, Sandpoint, Maravia, Bonners Ferry, Leonia, Troy and Libby. From Libby to Kalispell, meeting there the completed route to Belton, are three routes possible. Bonner, Lincoln and Flathead counties agreed to have their sections ready October 1. Lincoln county's agreement depends on the issue of road bonds held up by temporary injunction.

Costa Rica Taxes Trucks—Motor trucks will be assessed duty at the rate of 1.87 cents on entering this republic, according to a ruling from the treasury department at San Jose de Costa Rica.

Taxed on Capacity—Taxes are being collected by the city of Shreveport, La., on approximately $1,000,000 worth of motor cars. The taxation, however, is not based on the valuation but is graded as follows: Two-passenger cars, $2; four-passenger cars, $3; five-passenger cars, $4; seven-passenger cars, $5. Trucks pay $1 and public transfer wagon $10. The tax is assessed annually.

Controlling Canadian Chauffeurs—An amendment has been passed by the legislature of the province of Quebec which will give the cities the right to make by-laws controlling chauffeurs as cabmen are now controlled, and to inspect the meters in taxicabs. It will also make possible to establish a fine for passengers in these vehicles who do not pay the regular fare, the standard for which will be set. This has not been possible hitherto.

City to Post Signs—In a message to the select and common councils of Philadelphia Mayor Blankenburg has asked those bodies to make an appropriation of $1,000 for the purpose of placing conspicuously lettered signs for the benefit of motorists throughout the congested sections or such other places as it may be deemed necessary. These sections are to be placarded with signs calling attention to special speed regulations or containing the warnings "Danger," "Run Slow," etc.

Manitowoc Will Help—Five members of the Manitowoc County Automobile Club of Manitowoc, Wis., have donated $1,000 each for the purpose of improving the lake shore road from Manitowoc to Two Rivers, Wis. The sum of $5,000 will be the nucleus of a fund now being raised by the club for rebuilding the present natural dirt road into a fine macadam highway 30 feet wide. The completed lake shore road from Chicago to Sturgeon Bay will provide a drive 235 miles along the west shore of Lake Michigan.

Road Work Tied Up—Kent county, Michigan may be unable to construct the $600,000 worth of new highways which were planned and for which bonds were authorized. This is all due to what is said to be a flaw in the legislative act of 1909. The matter was brought to the attention of county officials when Bolger, Mossen Tillaman, of Chicago, gave notice that their clients would not accept bonds for which they had been given a contract. The bonding firm holds that the state law does not give a county the right to bond for longer than 15 years. The road bonds are for 20 years. It is likely the supreme court will be asked to pass upon the matter.

The Realm of the Commercial Car

Modern Motor Delivery Service Is Demanded by the Retailers of Coal

THE demands upon the coal dealer by his customers for more prompt and cleaner service are growing more pronounced each day, and while at times the dealer may feel that those requests are a little unreasonable, they seem to be based largely on the spirit of the times for quick action. It is probable that the installation of motor trucks by some dealers in each city has been responsible for the demand for quicker service. The possibilities of this method of transportation have been demonstrated and the high standard of deliveries, judging from a time basis, has come to be regarded as something to be expected generally. For this reason those dealers who have not adopted motor trucks have naturally felt themselves somewhat handicapped. The result has been a universal awakening of interest in the subject of motor truck delivery and any figures on cost and information on availability has been seized upon by dealers who have felt the changed conditions of the last year or so.

The firm of Spaulding & Spaulding, of Buffalo, for some time has felt the need of better equipment, and after making a careful survey of their requirements, concluded that in delivery matters at least an improvement could be made, provided the cost was not prohibitive.

A great many dealers who have seriously considered the installation of a fleet of motor trucks have been bothered by the question of comparative costs of delivery per ton. They have found themselves handicapped in making a comparison by reason of the fact that with the motor truck they have been enabled to keep an accurate record while with their horse delivery system they had no figures on which they could rely. Spaulding & Spaulding, however, some time before they bought their first motor truck, began to keep a careful record of delivery costs and also of complaints on service. They found that the latter were based principally on delays in delivery during the winter months when the streets were in bad condition and in other cases when trips were comparatively long. A matter that entered into their examination of costs was the gradually increasing price of horses, feed and labor.

The use of motor trucks was also looked into, and after thoroughly investigating the field a 5-ton Pierce Arrow worm-driven truck was selected as the firm's initial effort in the new way of delivery. The truck was placed in service the first of September last year, and a man who had been one of the teamsters was selected to drive it. His main recommendation was the care he had always shown with horses. He had little knowledge of truck machinery.

The figures compiled by Spaulding & Spaulding between September 1 and June 1 show that the truck actually handled 7,916 tons of all grades of coal at a price of $0.279 per ton, this figure including 6 per cent interest on the investment, general insurance of all necessary kinds, the wages of one driver and helper, tire expense, gasoline, lubricants, repairs and a fair annual allowance for overhauling, as well as an ample margin for depreciation. It was found that in tonnage the truck handled the work of two two-horse teams and one single, and reduced the cost by 20 cents per ton.

Within the same period, 8,093 miles were covered, and one phase of the experience that is of interest is the tire service. It was feared by the owners that this item of expense might be unduly high. Up to date this has been the case although mileage allowed was made in the computation of costs; and the tires on June 1 were estimated as being capable of at least 1,000 miles more.

An important angle was the rapidity of delivery in all kinds of weather, irrespective of the section of the city. Customers were not slow to show their appreciation of the new method, and at no time has it proven to be anything but more efficient and reliable than horses.

Other coal dealers in Buffalo have been watching these experiments with a great deal of interest, with an idea of also adopting motor service, and it is safe to say that because of the success of the Spauldings there will be others doing likewise in the near future, it is believed by Buffalo makers.

MOTOR CHANGES FIRE PLANS

The motor combination chemical and hose wagon is to be converted into a salvage wagon by authorities in Ottawa, Ont. For some time past, Fire Chief Graham has found that a great deal of the loss at fires has been due to water. For instance, in the case of the Powell grocery store on Wellington street, if there had been men who did not have to handle hose, to put up salvage covers right at the outset, about $200 of loss could have been prevented. As a result of a conference it has been decided to make an experiment with the motor combination wagon which is at the central station. At present, in addition to the chemical tank and hose, 1,000 feet of regulation hose is carried. Instead of the 1,000 feet, the amount of hose will be cut to 500 and there will be provision made for carrying a large supply of salvage covers. These will be taken from the other stations.

In the event of a fire there will be from five to seven men on this wagon, which will get there first almost invariably. Two men will go in with chemicals but the others will look after the salvage covers entirely. Then when the other stations

SALESROOM AND SERVICE STATION OF GRAND RAPIDS MOTOR TRUCK CO IN PHILADELPHIA

BOSTON SERVICE STATION OF GRAND RAPIDS MOTOR TRUCK CO.

get to the fire, the men of the chemical tank will devote their attention entirely to the salvage. They will have hammers, nails, etc., so as to be able to nail the covers over shelves in stores, etc. An experiment will be made for a month and if it proves satisfactory it is the intention to ask the board of control for more men and more covers. In other cities the salvage corps plays a most important part in saving fire losses and part of the expense is borne by the insurance companies.

BARBER GASOLINE-ELECTRIC CAR

A new type of gasoline-electric car is being manufactured by the Barber Car Co., York, Pa., which is being installed by many of the steam and electric railroads throughout the country. The car has a number of important advantages over the other type cars now in use. The capital stock of the concern was recently increased from $10,000 to $200,000 to enlarge the plant and carry on the business of the company on a more extensive scale.

The Barber gasoline-electric car is about the same size as an ordinary electric car and accommodates thirty-eight passengers. The car is large and roomy and entrance and exit is made convenient by folding doors on either side in the middle of the car. The 56-horsepower motor and generator used to propel the car are under the body supported on the two trucks. The generator connects with motors on the axles and furnishes the operating power. In winter time the car is heated by air taken from the outside coming through the radiator on the front of the car. The motorman occupies a space on the front part of the car partitioned off from the passengers. Much of the jolting on the electric and steam cars is done away with and riding is made much easier on the new type car. One great advantage of the new car is the absence of overhead wires and also that it is much cheaper to operate than is the trolley car.

About a gallon of gasoline is consumed in operating the car 4 miles. In a recent trip from Sunbury to York over the Pennsylvania railroad by one of the cars, the distance of 82 miles was covered in 2 hours 45 minutes. Twenty-two gallons of gasoline were consumed. The car attains a speed of from 30 to 40 miles an hour on straight stretches of the road and takes the usual grades with ease.

With the increased capital the company is contemplating the erection of a large factory for the manufacture of the car in this city. Plans and specifications are now being prepared for the new building. Work will be started on its erection early this summer. The plant will be one of the largest and most modern in this section of the state. Guy Webster is the president and E. A. Barber superintendent of the company.

COMPLAINS ABOUT MOTOR TRUCKS

A long session of the Montreal board of control was held June 27 when an immense amount of detail work was attended to. Attention was drawn to the increasing use of heavy steam and gasoline motor trucks in the city, by a letter from C. E. Archibald of 871 Dorchester West. Mr. Archibald complained that many of these powerful traction devices had been using Dorchester street, causing so much vibration that he feared not only for the cohesion of his ceilings but for the safety of his house. Some of these trucks, Mr. Archibald stated, weighed 3 tons, and 6 when fully loaded, which he considered must cause a tremendous streets on asphalt pavements. Unless something was done to regulate this traffic, he considered that serious damage would be done to both streets and to residences, not counting annoyance to the general public. He therefore asked if something could not be done to prevent these heavy trucks from operating on residential streets, or at least to lessen the chances for damage to residential property.

COMMERCIAL BREVITIES

The Motor Transportation Co. of Kenosha, Wis., recently incorporated with a capital stock of $25,000, has begun operations and is now furnishing a freight and passenger service from the center of the city to all parts of the south side of the city of Kenosha. A thirty-passenger bus, with a prepayment feature, is the initial equipment. The company is in direct competition with the street railway company but is covering a much larger and more direct territory.

FLEET OF JOHNSON MOTOR VEHICLES USED IN MILWAUKEE POSTAL SERVICE

Among the Makers

DEATH of W. M. Jenkins—Williard M. Jenkins, agent for the Abbott-Detroit and Krit cars in Boston and vicinity, died last week at his home at Exeter, N. H., after a brief illness. Mr. Jenkins was a member of the Boston Automobile Dealers' Association for many years.

Nichols Goes to Detroit—Fred C. Nichols, for the past 2 years connected with the Whitten-Gilmore company in Boston, agent for the Chalmers, has resigned to accept a position as assistant to Percy Owen, sales manager of the Chalmers at the factory in Detroit. R. A. Dobyns has taken Mr. Nichols' place with the Whitten-Gilmore company.

Axle Plant Almost Ready—This new four-story addition to the Timken-Detroit axle plant is rapidly approaching completion. Of steel and brick construction, the new building is 150 feet long and 75 feet wide. Relieving factory congestion, the four floors will increase manufacturing space 15 or 20 per cent. The shipping department will occupy the ground floor. The other three will be devoted to manufacturing purposes.

Receiver Demanded—Suit has been brought in the superior court at Indianapolis by the Indianapolis Light and Heat Co., asking that a receiver be appointed for the Motor Starting Co. The suit was brought on on account of $116 for electric current and it is charged the concern, which has been manufacturing a motor starting device, is insolvent. Lew W. Cooper, formerly president of the board of public safety, is president of the company.

Flint Body Co. Closes Doors—Following an order made in the United States court in Bay City, Mich., the Flint Body Co. closed its doors. Action in the court was taken by creditors of the concern. An inventory will be taken and the future of the company decided. Robert H. Cook, who was vice-president and secretary of the company, has been chosen by the creditors as receiver. The company was incorporated January 1, 1909, and capitalized at $50,000. William E. Stewart, president and treasurer of the company was principal stockholder.

Owner Held Liable—Hereafter, if the proprietor of a garage in Ottawa, Ont., allows a car to be taken from his garage, and the driver of the car commits a breach of the civic motor by-law, the owner of the car will be held responsible, according to a police court decision.

Saxon Company Moves—The Saxon Mfg. Co., one of Toledo's infant manufacturing concerns, maker of lamps, horns and accessories has removed from its original building on South Ontario street to large quarters on Cherry street. The new building has been remodeled, refinished and refurnished.

Walpole Moving to Foxboro—The Walpole Rubber Co., that recently entered the time-making field at its plant at Walpole, Mass., has found the buildings there inadequate to get out as large a supply as the business warranted and so an unused factory at Foxboro, Mass., embracing 3 acres of floor space has just been secured and the work of installing tire machinery will begin at once. The company plans to turn out 1,000 tires a day in this new plant.

Perfex Car Makes Its Debut—"I christen thee Perfex and welcome thee and thy builders into the fold of the many industrial institutions that now grace our fair southland." With these words, H. B. Gurley, assistant secretary of the Los Angeles Chamber of Commerce, broke a bottle of Owens river water over the radiator of the newest motor car to make its advent into southern California. The new car is built in Los Angeles and therefore the welcoming ceremonies. The machine was designed and built by James Fouch in his new plant in Los Angeles. Several wealthy easterners are interested in the Perfex company, among them Paul Brown, a broker and member of the New York stock exchange.

Claims Credit for Wilkinson—Self-starters are not new by any means, according to a statement emanating from the Franklin Automobile Co., Syracuse, N. Y., which says that the first Franklin built by John Wilkinson, the inventor of the Franklin motor, 10 years ago had a compressed air starting device.

Cole Handling Own Product—July 1 the Cole Motor Car Co., of Indianapolis, absorbed the Henderson Motor Sales Co. and will conduct the distribution of its product under the name of the manufacturing company. C. P. Henderson, who has been the active head of the sales company, is retained as general sales manager.

Estep Quits Packard—E. Ralph Estep, advertising manager of the Packard Motor Car Co., has resigned his position and is no longer connected with that company. Mr. Estep has had charge of the Packard advertising, except at two brief intervals, since the early years of the company. Mr. Estep's future plans are not announced. As yet there has been no successor appointed, at the Packard plant. No reason is given for the change.

Krit's New Testing Track—The Krit Motor Co. has introduced a novelty in its test of completed cars, which will appeal with force to other companies in Detroit, which have been troubled by the necessity of testing on city streets. The Krit people have built a private roadway near their plant on the boulevard, and are now doing all their testing there. The track is generally circular and contains one smooth straightaway for the development of speed; a hole of deep sand to test the pulling powers of the cars, and a spot where hard

GROUP PICTURE OF PROMINENT MEN IN THE MOTOR INDUSTRY WHO ATTENDED HOMECOMING

and Dealers

irregularities and bumps develop whatever weaknesses the cars have in structure, material and spring suspension.

Enlarging Tire Factory—D. Lorne McGibbon, president of the Canadian Consolidated Rubber Co., of Montreal, has announced that the company has decided to enlarge the scope of its business by erecting an additional factory for the exclusive manufacture of motor car tires.

Austin Reorganizing—With George H. Davidson and W. R. Shelby interested with James E. and Walter S. Austin, the Austin Automobile Co. of Grand Rapids, Mich., is being reorganized with a capitalization of $500,000. Three hundred thousand dollars will be common stock and $200,000 6 per cent preferred. Stock will be open for popular subscription and a 50 per cent bonus of common may go with the preferred. It is planned to build a new factory.

Republic Will Increase Stock—The directors of the Republic Rubber Co., of Youngstown, O., have authorized the calling of a stockholders' meeting to be held early in August for the purpose of increasing the authorized capital of the company from $4,000,000 to $10,000,000. The capital will consist after the increase of $6,000,000 common and $4,000,000 preferred stock. No definite announcement has been made as to amount of the additional capital to be issued this year. It is understood however, that the steady growth of the company's business will require new capital before another season. The directors also have authorized the construction of a large modern reclaiming plant, which with the completion of the five-story building now under construction will give considerably greater capacity. It has been reported that there will be a common stock dividend of some size, after the increase of capital has been provided; but there has been no definite action taken in regard to the stock dividend.

Engineers Change Jobs—Two engineers, prominent in the motor car field, have made changes for the coming season. Fred Hawes, for several years with the Cadillac, has joined the Everitt forces and will act as consulting engineer under Will Kelly, the chief at that plant. C. S. Young, engineer and designer for the Lozier company, has severed that connection and has joined the forces of the Regal, with the title of assistant general manager to Fred Haines.

Corbin Making Speedometer—The Corbin Screw Corporation, a division of the American Hardware Co., of New Britain, Conn., announces that it will manufacture and market the Corbin-Brown speedometer. The device has heretofore been known as the Brown speedometer, but under the new name will embody a number of improvements. Colonel W. C. Brown, the inventor, will become sales manager of the speedometer department of the Corbin Screw Corporation.

Wants the Land Back—An effort to take back the land and factory occupied by the Clark Motor Car Co. has been started by the Citizens Industrial Asociation, which about 2 years ago turned the land and plant over to the company. The association has brought suit to foreclose a mortgage and for liquidated damages, asking $26,000, on the ground that the company has not complied with an agreement to employ 150 persons for a period of 5 years, beginning 90 days after the company began operations. Involuntary bankruptcy proceedings were brought against the company some time ago and the plant was recently reopened after having been closed since February. The involuntary bankruptcy proceedings were settled.

Carter Corporation Plant Sold—The plant of the Carter Motor Car Corporation, at Hyattsville, Md., was sold at auction last week and was bid in for $12,000 by P. M. Galvin, acting for the Independence Motor Co. It is understood this action was taken to protect the stockholders of the defunct corporation. It is planned to organize a new directorate of the Independence company and resume operations.

Lion Will Stay in Adrian—Directors of the Lion Motor Car Co., which recently lost its plant in Adrian, Mich., by fire, have decided to accept the offer of the city of Adrian of a complete factory building in that city, and will equip it as a motor car plant immediately. This plan will enable the Lion people to fulfill their contracts for orders of parts and supplies already purchased for their 1913 line.

Another Horn Suit—The Aermore Mfg. Co., which last week filed suit in the United States circuit court, at Chicago, against the New Era Mfg. Co., maker of the Trinity Chimes horn, asking for an injunction and damages, has filed in the same court a similar suit against the Big Four Horn Co., of Watseka, Ill., manufacturer of the Big Four horn, asking for an injunction to restrain the manufacture of such horn and claiming an infringement of patent owned by the Aermore Mfg. Co.

Denniston Assets Sold—The hearing in the Denniston company bankruptcy proceedings held at Buffalo last week resulted in the sale of the company's property to Dr. Edward J. Meyer, 1312 Main street, for $9,050. The bankruptcy petition indicates that liabilities amounted to $65,745.94, of which $60,385.38 were unsecured. Its assets were $99,636.27, stock being $5,089.43, machinery $19,219.42, and open accounts $13,727.17. A final hearing in the company's affairs has been set for Wednesday, July 10.

CELEBRATION OF THE HAYNES COMPANY AT ITS PLANT IN KOKOMO, IND., LAST WEEK

Development Briefs

Bridge's Starter for Ford Cars Cranks Motor from Seat by Pull on Chain—Michelin Repair Kit—A New Tire Filler—Boring Cushion Spring Wheel

FIG. 1—MACO STARTER SPARK PLUG

Cranks Fords From Seat

AT the remarkably low price of $12, the Bridges starter, is to be put on the market by C. E. Bridges, Chicago. The new appliance is purely mechanical, being operated by a pull on a small handle located on the dash between the seats, see Fig. 7, and may be operated by either occupant. The starter attaches to the front of the radiator, in the place of the usual crank, see Fig. 6, and consists of a segmental metal spider, roughly one-third of a circle, the rim of which is a groove in which a light chain works. This chain is led by a pulley and a metal tube to a clutch on the dash, where it is attached to a handle. A pull on the chain is sufficient to turn the motor past two cylinders, which is twice the usual crank stroke, the segment being returned by means of a spring, hidden behind an ornamental circular brass plate. The device uses the same ratchet as is furnished with the car, employing a safety release that opens in case of back-fire. A primer is included with the outfit, for use in cold weather, and a handle to be attached to an arm of the segment for hand cranking to test compression. A small lock is applied to the chain clutch on the dash to prevent theft of the car. The device is finished in black enamel, except the dash parts, and is claimed to be much easier in action than the crank.

Michelin Repair Kit

Measuring 6 by 3 by 3½ inches, the new Michelin repair box contains almost everything the motorist will need for roadside tire repairs. The kit is contained in a substantial metal box, and contains a 2-ounce can of pure gum cement; an envelope containing six assorted red Para inner tube patches; a blow-out patch; a large piece of emery cloth; a box of talc; and a can of mastic, which is a quick hardening plastic cement for healing cuts in casings, and punctures in tubes. It is more than a cement, being more in the nature of a filler for holes in the tire casings.

New Tire Filler

Chemical rubber is the latest compound to substitute air in pneumatic casings, and is the product of the Chemical Rubber Co., Chicago. The compound is composed of secretly compounded chemicals, and is said to contain no oil, grease, or other matter detrimental to rubber. It is black, and said to be immune to climatic conditions. Unlike most tire fillers now on the market, it is not stuffed into the casing as sausage meat into a sausage casing, but is injected into the tire in the liquid state, and cured by a secret process, making practically a solid tire. It is baked from 7 to 9 hours, at a temperature of from 107 degrees to 135 degrees fahrenheit. Of course this process requires that the tires be sent to the plant, which is located in Milwaukee, Wis.

Boring Cushion Wheel

For the purpose of doing away with pneumatic tires on motor cars, and eliminating body springs on lighter vehicles, Robt. E. Boring of Carlinville, Ill., has patented a spring wheel illustrated in Fig. 4. The wheel consists of two principal members, one, a rigid rim, to which a steel or rubber tire may be applied, attached to a rigid spider, the center of which is an open ring; the other a floating hub, to which is secured twin disks or side-plates, between which the spokes and inner ring of the spider are free to oscillate, any lateral thrust being withstood by the disks or webs, which are rigidly bolted together, the bolts passing between the spokes of the spider. This floating hub is held normally concentric with the rim by means of coiled springs, interspersed between the rigid arms of the spider, and are flexibly attached by telescopic hangers between the rim and the disks. The oscillation of the hub, as induced by loads or impact with inequalities in the road, is cushioned by the springs, and limited by the inner diameter of the central ring of the spider. The suspension of the springs is adjustable to permit of increasing or decreasing their tension, to adapt themselves to varying loads, and conditions of use.

FIG. 3—STEVENS TIRE VALVE

Stevens Tire Valve

Stevens Mfg. and Supply Co., of Chicago, has just announced a new tire valve, differing radically from the type hitherto universal. It is designed to screw on to the old style of valve, by simply removing the cap and core, and screwing on the hexagonal end of the new valve. The new valve, as may be seen in Fig. 3, is extremely simple, consisting of but seven parts, as against eleven of the old type. It has no springs, the action being through a bronze ball, and the valve area is said to be seven times greater than other tire

FIG. 2—SIDE VIEW OF HUFFMAN HOODLESS CAR

Novelties for Motoring

Maco Starter Spark Plug Makes Connections for Acetylene Device in Any Engine—Hoodless Motor Car Body Gives More Room With Same Wheelbase

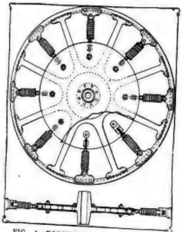


FIG. 4—BORING CUSHION WHEEL

valves. Every motorist knows the great resistance offered by the ordinary valve, even though the tube be empty, while it is claimed that the Stevens exerts no back pressure whatever, other than the actual pressure of the air in the tire. It is constructed of non-rusting metals.

An Apron Overall

Tourists will be interested in a combination of apron and overall for protecting their clothing when working around a car. This is called the Koverette and it is made by the Berlin Fabric Mfg. Co., Berlin, Wis. In construction, the Koverette is an apron while in appearance it is sort of overall. The apron is split down the middle to form the trouser legs which are fastened by a strap at the knee and a snap button at the instep. The garment is said to be grease and waterproof and can be folded up to the size of a newspaper.

Hoodless Motor Car

A hoodless body which carries the seats amidships of the wheels, has been patented recently by C. F. Huffman, of the Colby Motor Car Co., Mason City, Ia. The seats are carried further forward than is possible with the same length of engine and wheelbase with standard construction. The design is similar to designs that are attracting attention in Europe. As may be seen in the Figs. 2 and 5, the additional space is obtained by widening the body forward, allowing a narrowed engine compartment to extend back through the forward floor boards, in a manner similar to the way in which the boiler of a locomotive extends into the cab. A copious cowl covers this and the foot compartments which are situated on either side of the motor. The dash is divided into two halves which are placed above the foot compartments. The radiator is placed in the usual position, and is attached directly to the cowl. This construction affords as much accessibility as with the dash radiator, offering the additional advantage of access to the engine without leaving the seat.

The rear seat should prove a revelation in comfort, because of its position forward of the rear axle, instead of above it, which space affords an ideal location for the fuel tank. This design should prove a safe one, eliminating, as it does, dangerous overhang at the rear. The design as a whole carries out the much desired stream-line effect admirably, and should prove very graceful, as it avoids the usual break in the body lines at the dash.

Maco Starter Plug

For motors not equipped with priming cups, the Maco starter plug, manufactured by the McDonald Appliance Co., Chicago, is a useful accessory to all forms of gas starters. It consists of a well-made spark plug, which sells at the standard price, and which instead of screwing direct into the cylinder itself, is screwed into an adapter, B, in Fig. 1. This adapter is threaded to fit any standard spark-plug tap, and has a small elbow union to which is soldered the gas tube of the starter system and once inserted never requires to be removed. The plug A, which may be purchased separate from the adapter, is standard in every way except, that it is threaded to fit the adapter instead of the cylinder itself, is made slightly longer than standard, to accommodate it to Ford and similar motors; and is especially grooved to provide passage for the gas. These grooves are open and may be cleaned with a knife blade, the upper one extending entirely around the body of the plug, so as to register with the inlet from the union, regardless of the position of the latter in relation to groove C. Groove C is terminated by the injector nozzle, which extends below the spark points. The use of this plug should be beneficial even on motors equipped with priming cocks, because of the fact that it may be readily cleaned without disturbing the starter connections, which is true of no priming cup, this latter fact being a common objection to ignition starters.

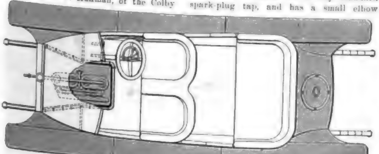


FIG. 5—PLAN VIEW OF HUFFMAN HOODLESS CAR

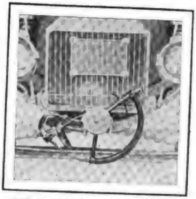


FIG. 6—BRIDGE STARTER ON FORD

FIG. 7—HANDLE OF BRIDGE STARTER

Rub-On Top Lining Dye

Faded top linings are often a source of embarrassment to motorists but a dye by which the color can be removed has been produced by the Rub-On Varnish Co., Buffalo, N. Y. It is stated that the dye is a fast color and will not run when wet.

Brief Business Announcements

Recent Agencies Appointed by Pleasure Car Manufacturers

Town	Agent	Car
Alexis, Ill.	W. K. McKnight	Henderson
Atlanta, Ga.	Dan Walraven	Henderson
Anderson, S. C.	Fowler's Garage	R-C-H
Allentown, Pa.	Queen City Motor Co.	R-C-H
Battle Creek, Mich.	F. E. Riley	R-C-H
Boston, Mass.	Fred O. Hoyt	Havers
Boston, Mass.	Case Mfg. Co.	Case
Boston, Mass.	James A. Binney	Henderson
Belvidere, Ill.	H. H. Collier	R-C-H
Champaign, Ill.	A. L. Percival	R-C-H
Crosswell, Mich.	Fred A. Moore	R-C-H
Coldwater, Mich.	Coffman & Boucher	R-C-H
Des Moines, Ia.	Interstate Auto Co.	Paige-Detroit
Erie, Pa.	Murphy Brothers	R-C-H
East Liverpool, O.	George W. McNichol	R-C-H
Fergus Falls, Minn	Martin Johnson Auto Co.	R-C-H
Iowa City, Ia.	F. C. Carson	Franklin
Kansas City, Mo.	E. P. Moriarty & Co.	Regal
Laurens, S. C.	Rounds Auto Co.	R-C-H
Mattoon, Ill.	Mattoon Refrigerating Co.	Henderson
Milwaukee, Wis.	Smith-Hoppe Auto Co.	R-C-H
Milwaukee, Wis.	Rohde Automobile Co.	Havers
Milwaukee, Wis.	D. Wittenberg	Cartercar
Mansfield, O.	Myers & Morris	R-C-H
Mankato, Minn.	Mankato Automobile Co.	R-C-H
Morris, Ill.	O. T. Wilson	R-C-H
Niles, O.	Park Auto Sales Co.	R-C-H
Oak Grove, Mo.	W. T. McLaurins	R-C-H
Painesville, O.	Star Garage	R-C-H
Philadelphia, Pa.	Johnson Motor Car Co.	Henderson
Plainfield, N. J.	Service Garage	Henderson
Princeton, Ill.	Evans & Coopins	R-C-H
Roanoke, Ala.	R. L. Allen	R-C-H
Scranton, Pa.	Edward and Howard Conrad	R-C-H
St. Michael, Minn.	H. W. Dick & Son	R-C-H
Washington, D. C.	Storm Motor Car Co.	Hupp-Yeats
Wheeling, W. Va.	R-C-H Motor Co.	R-C-H
Winston, Mo.	W. H. Dice	R-C-H
Woodstown, N. J.	Newton and Reeves	R-C-H

COOPERSVILLE, MICH.—William J. Damoth has opened a repair shop.

Lexington, Ky.—The Bayless Motor Car Co. has changed its name to the Central Motor Car Co.

Anderson, Ind.—The Remy Electric Co. has appointed W. H. Lolley, of London, Eng., as an engineer in the service department.

Ionia, Mich.—The Hayes-Ionia Co. has closed a contract for the construction of four kilns and a machine room addition to its factory.

Cleveland, Ohio—The Park Motor Car Co. has filed notice of an increase in capital stock from $10,000 to $15,000 and a change in name to the Park Motor and Mfg. Co.

Buffalo, N. Y.—George Ostendorf, Franklin dealer, has bought out the interest of H. E. Crosby, formerly associated with him, thus becoming the sole owner of the George Ostendorf Co.

Denver, Colo.—Orin S. Wilson, for 2 years general manager of the Studebaker Colorado Vehicle Co., has been called east to supervise more extensive territory. He has been succeeded by his assistant, J. C. Beck.

Buffalo, N. Y.—The property at 754 Main street, which is occupied by the Pierce-Arrow company's sales department and garage, was sold last week by William H. Hotchkiss to Walter L. Schoellkopf for $250,000. The purchase was made solely as an investment and the Pierce-Arrow company will remain in the building.

Buffalo, N. Y.—A company known as the Auveco, just formed here, is completing arrangements for the opening in Main street of a commercial and pleasure vehicle garage and salesroom. The officers of the new corporation include Otto A. Magelin, Thomas LaVere, Walter W. Miller, W. H. Rodenhouse, James Fox, Forbes Foster, Fred Baker, Frank H. O'Neill, James Moran, W. H. Gentz and Henry G. Walters.

St. Paul, Minn.—The Osborn garage, has been sold by E. W. Bazille to George Benz & Sons, for $30,000.

Kansas City, Mo.—Arrangements are now being made to establish a Marmon branch here. Fred Clinton is in the city looking over sites.

Indianapolis, Ind.—Arthur H. Berndt will become assistant manager of the Indianapolis branch of the Remy Electric Co. on September 1.

Columbus, Ohio—Viola Horn has taken out a permit for the erection of a garage building on Spring street, between High and Third streets, which will be used as a public garage.

Boston, Mass.—John Dalton has been appointed manager of the George Sumner Co.'s branch in this city, agents for the Rayfield carbureter with salesrooms on Boylston street.

Louisville, Ky.—The Everitt Motor Car Co. of Detroit, Mich., has established a branch office in the Coleman building in this city. E. L. Jacoby, formerly manager of the Studebaker branch at Memphis, is in charge.

Kenton, Ohio—The Kenton Gas Engine Co. has added a motor car repair department to its plant. The company will also handle a full line of motor car accessories as well as the Kenton agency for the Knight tires. T. A. Taylor is general manager.

Philadelphia, Pa.—The Chase Motor Sales Co., of Philadelphia, has been organized to take over the agency for this city, and Montgomery county of the Chase line of trucks, under the management of J. A. Rogers. Salesrooms and service station are at the northeast corner of Broad and Wallace street. A service and maintenance station will also be established at Fiftieth and Warrington streets, West Philadelphia.

Columbus, Ohio—The city government of Columbus is taking bids for the erection of a garage for the housing of the motor cars of the city officials.

Anderson, S. C.—The Anderson garage, opened recently, has floor space 95 feet by 60 feet. The garage is located in the center of the city.

Seattle, Wash.—W. A. Wicks, for the past 5 years a member of the engineering staff of the H. H. Franklin Mfg. Co., has resigned to take up the Franklin dealership in Seattle, Wash.

Columbus, Ohio—M. B. Currier, who has been a mechanical expert with the Interstate Auto Co., has been placed in charge of the Columbus agency, which is located at 142 East Gay street.

New Britain, Conn.—The garage on Arch street, conducted by H. B. Freeman, of Hartman, has been sold to Aaron Cohen. The purchase includes the Ford agency here, formerly conducted by Mr. Freeman.

Los Angeles, Cal.—W. Nevin, for several years sales manager of the Pacific Coast Motor Car Co., has resigned from that company and quit the motor car business for the real estate business.

San Francisco, Cal.—T. J. Beaudet, who has earned his reputation as a driver of Cadillac cars on the Pacific highway trip to the City of Mexico, has been made mechanical superintendent of the San Francisco house of Don Lee Co.

Chicago—The Chicago branch and central division offices of the General Motors Truck Co. have been moved from 2201 Wabash avenue to 1811 McCormick building. The three-story building on Wabash avenue is now entirely devoted to the garage and service department. Officials are H. B. Ramey, central division

manager; Ralph Birchard, assistant central division manager, and George Siegmund, Chicago branch manager.

Minneapolis, Minn.—O. W. Klose has been made manager of the United Motor Co., to succeed E. B. Stimson.

Denver, Colo.—The Shaffer Auto Supply Co., of 1240 Broadway, is a new organization which will handle standard accessory and supply accounts.

Greenwich, Conn.—Newton R. Goltra has just opened a garage on Railroad avenue under the name of the Depot Garage and Machine Works.

Washington, D. C.—The garage of the Carpenter Automobile Co., which has been going through bankruptcy, has been purchased by Paul Peck and D. B. Gish.

Albany, N. Y.—John Croissant has completed plans for the construction of a large garage at 203 Washington avenue. The building will be three stories in height.

Winnipeg, Man.—The Darwen Motor Truck Co., which was recently organized to exploit the Commer truck in western Canada, has permanent headquarters in the Imperial garage, Osborne Place.

Winnipeg, Man.—J. M. Ritchie & Co. have taken over the business formerly conducted by A. C. Waters at 62½ Princess street. The firm specializes in producing and repairing sheet metal parts for motor cars.

South Bend, Ind.—The Otis Motor Car Co. has been incorporated here with capital stock of $10,000, the incorporators are N. L. Otis, Gilbert Squires and J. B. Beattie. The company is now located at Main and Division streets and it is announced there will be no change in the method of conducting the garage. The company has the agency for the Kelly, Franklin and Chase trucks, and the Cadillac and Franklin pleasure cars.

Gloucester, Mass.—A large brick garage is being erected on Western avenue for the Perkins & Corliss Co.

West Rutland, Vt.—Richard Mead and Arthur Walker are erecting a garage and repair shop on Clarendon avenue.

Gardiner, Me.—M. M. Spear and W. L. Tozier have taken the lease of the garage building on the causeway opposite the depot, and have opened a general accessory business and storage service there.

Washington, D. C.—The Winton Motor Car Co. has been organized to handle the Winton and has secured temporary offices in the Warder building.

Kansas City, Mo.—The Mercer company, of Trenton, N. J., has established a branch in this city. Roy O. Kendall is the manager at 1524 Grand avenue.

Boston, Mass.—F. W. Richards, who was formerly connected with the local branch of the Premier car, is now sales manager of the agency recently opened here for the Michigan.

Chicago—The Rhineland Machine Works Co. has opened an office and store at 1254 Michigan avenue, which it will occupy together with the American Electric Mfg. Co. D. D. Davis is in charge.

Philadelphia, Pa.—A factory branch of the Peerless line of motor cars and motor trucks, under the firm name of the Peerless Motor Car Co., will soon be opened at 245 and 247 North Broad street, under the management of R. W. Cook, recently sales manager of the Automobile Sales Corp., which formerly handled the Peerless in this territory. Pending completion of the permanent home temporary offices have been established in the Abbott building, Broad and Race streets.

Salt Lake City, Utah—The Alkire-Smith Auto Co., which handles Ford cars for Utah, western Wyoming and southern Idaho has moved to its new quarters at 67 and 69 West Fourth South.

Montreal, Can.—It is stated that a company of American capitalists, associated with Montreal men, has organized a company to commence the manufacture of motor cars here in the near future.

New York—The Baldwin Chain and Mfg. Co., of Worcester, Mass., has established a branch at 416 Broadway. It is in charge of Charles D. Schmidt and will carry a stock of Baldwin chains and sprockets.

Syracuse, N. Y.—George E. Yoa, agent for Abbott-Detroit cars, has opened on South Clinton street a new garage capable of storing 100 cars. The building is of cement and brick with large salesrooms and repair department.

Danbury, Conn.—The Fillow Auto Co. has purchased two lots immediately east of its garage on Crosby street, which will be used temporarily for day storage. Later a new structure devoted to the motor truck business will be erected on the property and joined to the company's present structure.

San Francisco, Cal.—To handle its constantly increasing business in the Pacific coast territory the R-C-H Corporation, through its western sales manager, A. E. Morrison, opened a branch and service station at San Francisco on July 1. The building is a three-story structure on Ellis avenue just off Van Ness, in the heart of the new motor car district, with a floor space

Recent Incorporations

Akron, O.—Akron Gear and Engineering Co., capital stock, $20,000; to manufacture gears, incorporators, J. R. Triplett, O. E. Prier, T. A. Seacrist, E. T. Dwyer, J. E. Blower.

Barberton, O.—Todd & Courtney Co., capital stock, $10,000; to deal in motor cars; incorporators, J. H. Todd, O. I. Courtney, L. E. Courtney, C. C. Courtney.

Boston, Mass.—Seymour Avenue Garage, capital stock, $25,000; incorporators, C. R. Sibley, J. E. Moulton, E. Jefts.

Brooklyn—Saratoga Auto Co., capital stock, $5,000; incorporators, G. D. Smith, H. A. Bogart, E. J. Bogart.

Buffalo, N. Y.—Automobile Vehicle Corp., capital stock, $20,000; to manufacture motor cars, directors, A. L. Kenyon, F. H. O'Neill, O. A. Hegelm, J. C. Fox.

Chicago—Washington Motor Livery Co., capital stock, $75,000; conduct motor car livery and repair shop; incorporators, C. Lewton, J. Lowenhaupt, S. E. Loeb.

Chicago—Dearborn Automobile Co., capital stock, $10,000; incorporators, S. Oppenheim, A. Rosenthal, J. C. Ahrensfeld.

Cleveland, O.—Auto Owners Co., capital stock, $25,000; to deal in motor cars, accessories and operate vulcanizing plant; incorporators, P. L. A. Leighley, H. N. Pettibone, W. K. Stanley, F. H. Forrest, J. B. Griesheimer.

Columbus, O.—Federal Auto Accessories Co., capital stock, $2,000; to deal in motor car accessories; incorporators, J. R. Loofburrow, H. M. McDonald, W. C. Wetherhold, E. J. Mace, M. L. Mace.

Columbus, O.—Everitt Auto Sales Co., capital stock, $20,000; to deal in motor cars; incorporators, H. K. Dobson, A. F. White, R. F. McConaha, H. H. Kellenberger, A. W. Daving.

Dover, Del.—Amplex Motor Car Co., capital stock, $1,000,000; to manufacture motor cars and vehicles.

Flatonia, Tex.—Flatonia Automobile Co., capital stock, $5,000; incorporators, C. P. Johnson, D. McKay, F. F. Wotpka, J. W. Snell.

Lima, O.—Gramm-Bernstein Co., capital stock, $500,000; to manufacture and deal in motor trucks; incorporators, B. A. Gramm, Max Bernstein, F. Blezantz, D. Bernstein, H. O. Bentley.

Louisville, Ky.—Punctureless Tire Co., capital stock, $5,000; incorporators, A. T. Murphy, J. H. O'Neill, J. S. Hobson.

Muncie, Ind.—Feeney Hurd Co., capital stock, $20,000; to manufacture universal joint; incorporators, E. J. Feeney, J. H. Leffler, C. E. Hurd, J. D. Miltenberger.

Nashville, Tenn.—Seaton Wheel Co., capital stock, $120,000; to manufacture motor car wheels; incorporators, G. Jackson, S. S. Lord, B. C. Seaton, J. T. Landis, J. R. Boone.

New York—Long Acre Garage, Inc., capital stock, $1,300; incorporators, L. M. Borden, G. Gulbransen, J. F. Taylor.

New York—Amherst Auto Renting Co., capital stock, $5,000; incorporators, P. V. Hoyt, D. J. McAndrews, G. Schippereit.

New York—Rutenber Motor Co., capital stock, $1,350,000; incorporators, N. P. Coffin, W. J. Maloney, H. E. Latter.

New York—Seymour Avenue Garage, capital stock, $25,000; general garage business; incorporators, C. R. Sibley, J. E. Moulton, F. E. Marble.

New York—Standard Auto Burial Co., capital stock, $200,000.

New York—Universal Auto Supply Co., capital stock, $10,000; incorporators, J. J. Treasy, G. F. Connelly, J. R. Hunt.

New York—C. and T. Auto Specialty Co., capital stock, $25,000; motor car trucking business; incorporators, H. G. Waring, H. W. Bell, H. G. Philipps.

New York—Goldfinger Auto Renting Co., capital stock, $2,000; incorporators, B. Goldfinger, W. E. Fisher, I. Wolf.

New York—American Society of Automobile Owners, Inc., capital stock, $10,000; incorporators, R. S. Kennedy, J. C. Murray, A. Woods.

Philadelphia, Pa.—Paxton Motor Car Co., capital stock, $15,000; incorporators, C. H. Paxton, W. A. Kuser, J. S. Vaughan.

Portland, Me.—Edwards Motor Car Co., capital stock, $2,000,000; to manufacture and deal in motor cars; incorporators, E. C. Eaton, T. L. Croteau.

Scituate, Mass.—Egypt Garage and Machine Co., capital stock, $6,500; incorporators, W. E. Chaffin, C. M. Litchfield, C. W. Peare.

South Bend, Ind.—Otis Motor Car Co., capital stock, $10,000; directors, N. L. Otis, J. B. Beattie, G. Squires.

Westfield, N. Y.—Westfield Motor Truck Co., capital stock, $100,000; to deal in motor cars; incorporators, W. F. Mogill, E. L. Hill, H. W. Hallbourg.

Wilmington, Del.—Rutenber Motor Co., capital stock, $1,350,000; to manufacture and deal in generators.

Wilmington, Del.—Keystone Automobile Exchange, capital stock, $100,000; incorporators, J. W. White, C. J. Jacobs, H. W. Davis.

of 18,000 square feet. The San Francisco branch will be used as a car and replacement distributing point for the entire west.

Toledo, O.—The Rassel Motor Car Co., of Toledo, O., has filed papers with the secretary of state decreasing its capital stock from $125,000 to $95,000.

Los Angeles, Cal.—August 1, F. O. Nelson, manager of the local branch of the Diamond Rubber Co., will leave his position after 5 years and will be succeeded by W. J. Voit, at present manager of the branch at Spokane, Wash.

Boston, Mass.—Wilbur F. Talbot, for some years connected with the Boston branch of the B. F. Goodrich Co., died a few days ago after an illness of some months. He came from Barnesville, O., and the body was sent there for interment.

Columbus, Ohio—The firm of John Immel & Sons has completed the erection of a large plant where motor car repairing is now being done in addition to body painting J. E. Jolly, formerly connected with the Packard factory, is foreman of the department.

Toledo, O.—The Ohio Electric Car Co. has taken out a permit for the construction of a three-story addition to its factory on Auburn avenue. The structure will be of brick and concrete and will measure 101 by 61 feet. The building will cost about $15,000.

Columbus, Ohio—The final steps in the merging of the Diamond Rubber Co. with the B. F. Goodrich Co. were taken recently when application was made with the secretary of state for permission to increase the capital stock of the latter corporation from $45,000,000 to $90,000,000.

Salt Lake City, Utah—The Salt Lake Automobile Exchange will handle the Columbia and Maxwell line as its leaders. This firm has in the past dealt entirely in second-hand cars. Plans are published for a new building in which to handle the business. A public garage is to be included.

Columbus, Ohio—R. M. Weaver and W. J. Miller, formerly with the Columbus Machine Co., have purchased the entire capital stock of the Broad-Oak Automobile Co. at 622 Oak street. The purchasers took charge July 1. The concern has the central Ohio agency for the Chalmers and Pierce-Arrow.

Rochester, N. Y.—The Shafer-Decker Motor Co., capitalized at $50,000, and recently organized, will handle for the next 3 years in this city the Cole. J. W. Jenkins has discontinued the manufacture of pleasure motor vehicles and the entire plant, known as the Jenkins Motor Car Co. will move and make way for the new concern which will locate at 1135 University avenue, this city. The new concern takes over the entire factory and equipment of the Jenkins Motor Car Co., together with its gasoline and oil house and service department in the rear. This will give it 20,000 feet of floor space with room for the storage of 100 cars.

Dayton, Ohio—Gilbert J. Loomis, general sales manager of the Speedwell Motor Car Co. for the past 5 years, has resigned, effective August 1, in order to give his time to the development of a motor car specialty in which he has been interested for some time.

Los Angeles, Cal.—The local branch of the Locomobile Co. of America, which was temporarily located at 942 South Grand avenue, is now occupying new permanent headquarters at Pico and Grand avenues. The new building is considerably larger than the temporary location.

Los Angeles, Cal.—Articles of incorporation have been filed by the Essenkay Sales Co., of California and Arizona, according to L. N. Brunswig, of Los Angeles, who has secured the agency. A local equipping plant will shortly be opened.

Philadelphia, Pa.—The department store has invaded the motor car selling field. The Wanamaker store is now the exclusive Philadelphia distributing agency for the Babcock electric. H. C. Snell is in charge of the Babcock sales department.

Philadelphia, Pa.—A four-story concrete garage to cost between $50,000 and $75,000 is to be erected for the Pullman Taxicab Co., on a lot 73.9 by 86.3 feet at 1534 to 1542 Wood street extending in the rear to include 1529 to 1533 Pearl street.

New York—Glenn A. Tisdale, of the Franklin Motor Car Co., dealer for the Franklin car in the New York city territory, has bought the controlling interest in the firm of John Kerwin Co., which maintained a large Franklin repair shop.

Washington, D. C.—The Motor Truck Co. has been formed to handle Atterbury and Hatfield trucks and Ford delivery wagons. C. Walter Hoover is the sales manager and has secured quarters in the Union Savings Bank building.

Boston, Mass.—The Case is represented in Boston with a branch salesroom, having been opened temporarily at 8 Columbus avenue. The company will later move to the Back Bay when a new salesroom and service station has been completed. George England will take charge of the branch.

Boston, Mass.—Fred O. Hoyt has taken on the agency for the Havers six with headquarters in Boston, but having a large part of New England for his territory. He has a service station at Jamaica Plain, and will shortly open salesrooms in Boston. Mr. Hoyt is the head of the Hoyt Carbureter and Automobile Co.

Lima, Ohio—E. Z. Jefferson, of Pittsburg, visited Lima, Ohio, recently with a proposition to establish a $500,000 tire manufacturing plant in that city in case the local people offer the proper inducement. It is announced that the promoters will furnish 52 per cent of the proposed capital of $500,000 if Lima people subscribe the remainder. It is proposed to give employment to 275 men.

Winnipeg, Man.—Walter Jackson has become western Canada agent for the General Motors Truck Co., of Detroit.

Fitchburg, Mass.—F. B. Higgins has just opened a public garage on Water street and will handle general accessories.

Kansas City, Mo.—W. F. Kneip, for the past 6 years commercial car engineer for the H. H. Franklin Mfg. Co., of Syracuse, N. Y., and E. F. Williams, also associated with the engineering department of the H. H. Franklin Mfg. Co. for about the same period, have resigned to take up the Franklin dealership in Kansas City.

Lima, Ohio—Fred Bizzants has accepted the position of chief engineer and factory manager for the Gramm & Bernstein Co., which will soon open a factory for the manufacture of motor trucks. The plant of the American Strawboard Co. is being remodeled into a factory for the making of motor trucks.

Omaha, Neb.—The W. N. Hellen Motor Car Co. is a new company just organized in Omaha and has the agency for the Firestone-Columbus cars for Nebraska and western Iowa. Mr. Hellen has been in the motor car business in Omaha for some time, previously being engaged in that industry in Kansas City. The garage is at 2416-2418 Farnam street.

Memphis, Tenn.—W. J. Shay has disposed of his interest in the Ozburn Automobile Supply Co. to N. F. Ozburn. Mr. Shay's resignation as vice-president and general manager of the company took effect July 1. Mr. Shay will take up the work of organizing the United States Sales Corporation, with offices in New York, Chicago and San Francisco.

Boston, Mass.—George H. Phelps, who during his year's service as manager of the retail branch salesrooms of the Studebaker Corporation, placed it in second place in the number of sales, has been promoted to manager of the New York branch of the company to succeed Charles F. Redden. Frank X. Coveney has been made manager of the Boston retail branch.

Bridgeport, Conn.—The Locomobile Co. of America has commenced work on the new building which is to be used for the construction of its commercial vehicles. The new building should be completed within the next 60 days, and until that time the company reports trucks will be constructed in the regular departments of the factory.

Providence, R. I.—The Foss-Hughes Automobile Co., which has the agency for the Pierce-Arrow car for Rhode Island, Philadelphia and other cities, has just purchased 35,000 square feet of land located at the corner of Wesleyan avenue and Plenty street, for the purpose of erecting a modern brick salesroom and service depot. The property was assessed for $29,380.

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MOTOR AGE

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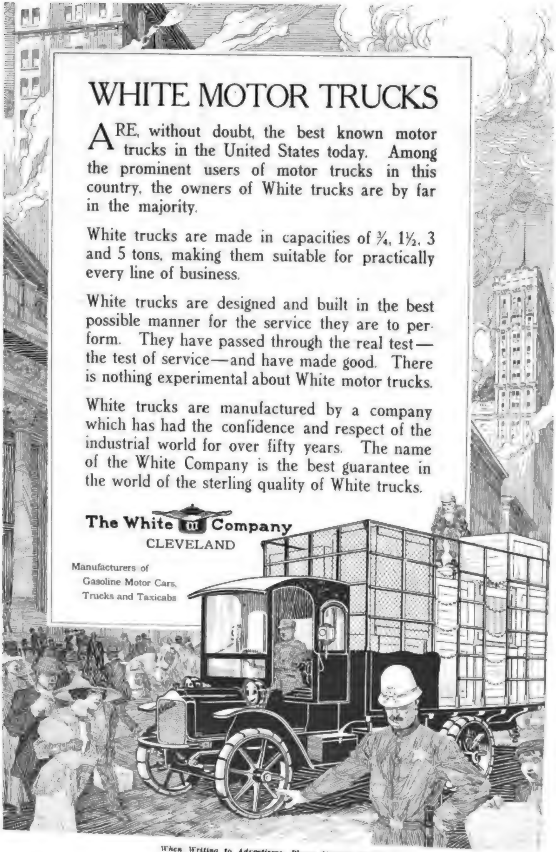

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VOL. XXII, No. 2 CHICAGO, JULY 11, 1912 $3.00 PER YEAR

MOTOR AGE

Tetzlaff Adds to His Speed Laurels

TETZLAFF TAKING TURN AT LAKE VIEW

Fiat Driver Takes Both Free-for-all and Heavy-Car Races in Tacoma's Road Carnival—Flanders, Stutz and Mercer the Other Winners

By F. K. Haskell

TACOMA, WASH., July 7—Success attended the running of the five road races promoted by the Tacoma Automobile Club and the Tacoma Montemara festo committee on Friday and Saturday of last week, the 2-day carnival being run off without accident on the new 5-mile course at Lake View, near this city, with from 60,000 to 70,000 persons watching the sport.

Teddy Tetzlaff, holder of the world's road record, was the star of the meet, driving his Fiat to victory in the heavy-car race the first day and annexing the free-for-all yesterday. In the Friday race Tetzlaff averaged 68.66 miles per hour for 200 miles, while in the 250-mile free-for-all yesterday he averaged 65.8 miles per hour. The medium-heavy car race Friday at 150 miles went to Cooper in a Stutz with an average of 66.6 miles per hour. Pullen in a Mercer took the 150-mile medium car race at 61.9 miles per hour, while the light-car race at 100 miles was taken by Evans in a Flanders special at 61.1 miles per hour, with the Tower Flanders special in second place.

Friday morning's races, although sensational, did not equal the afternoon contests. A series of mechanical troubles resulted in all the cars in the medium-light car class being withdrawn with the

THREE WINNERS

Top illustration—Teddy Tetzlaff, Fiat, winner of free-for-all and heavy car race

Middle—Earl Cooper, Stutz, winner of medium-heavy car race

Bottom—Bob Evans, Flanders, winner of light-car race

ONE OF THE TURNS ON TACOMA COURSE NEAR LAKE VIEW

exception of the Mercer driven by Pollem. In the light-car class, which was run in connection with the medium-weight car event, there was an especially pretty and thrilling race. Evans in a Flanders special took the lead early in the race and never was headed. Tower, also in a Flanders special was second. The Maxwell, Oakland and Ford finished in the order named.

Tetzlaff's Friday Victory

Tetzlaff won the heavy-car race in the afternoon over forty laps. He won by steady driving on the dangerous curves and bursts of speed on the straightaway stretches. Mulford took the turns at high speed, which tore his tires into ribbons and forced him to go to the pits four times. Finally he came in with a bleeding head caused by a flying stone and relinquished the wheel to his mechanician, Chandler, who finished the race. Tetzlaff went to the pits but once for tire trouble and once for gasoline. The Fiat pit men had excellent team work, while the Knox men were considerably slower.

Hughie Hughes played in hard luck in both days' races, having considerable engine trouble, burning out clutch on the Mercer in the medium-car event and in the free-for-all he suffered a broken connecting rod.

Great enthusiasm developed in the big event yesterday when Tetzlaff and Mulford held a duel of speed and Tetzlaff won. Mulford's car was fast, but Tetzlaff's tire luck was with him, which was helped by careful driving at the turns. Mulford took these with scarcely a perceptible slackening of speed. Earl Devore's National also was a victim on tire trouble and he was forced to go to the pits three times.

The two races in the afternoon were run simultaneously. The Mercer, Stutz, National and Pope entered in the heavy-car event and all except the Pope kept on after 150 miles were run off and continued in the heavy-car race.

Tacoma Race Results

FRIDAY, JULY 5

LIGHT CARS, PURSE $1,000, 100 MILES

Position	Car	Driver	Time
First	Flanders Special.	Evans	1 :38 :20 :00
Second	Flanders Special.	Tower	1 :39 :04 :35
Third	Maxwell	Joermann	1 :42 :19 :50

MEDIUM CARS, PURSE $1,500, 150 MILES

First	Mercer	Pollem	2 :25 :13 :00
Second	Mercer	Bergdoll	

Failed to finish—Mercer, Hughes; Cole, Blizzard.

Sebastian injured in practice and could not take part in race.

MEDIUM-HEAVY, PURSE $1,000, 150 MILES

First	Stutz	Cooper	2 :15 :00 :00
Second	National	Devore	2 :21 :10.15
Third	Pope	Rossi	2 :26 :53.70

HEAVY CARS, PURSE $2,500, 200 MILES

First	Fiat	Tetzlaff	2 :54 :31 :65
Second	Knox	Mulford-Chandler	2 :58 :10 :15
Third	National	Devore	3 :05 :42 :00

Failed to finish—Mercer, Hughes; Cole, Biz-Hughes.

SATURDAY, JULY 6

Free-for-all, 250 miles

No.	Car	Driver	Time
44	Fiat	Tetzlaff	3 :47 :00 :45
43	Benz	Bergdoll	3 :50 :49 :85
22	National	Devore	3 :52 :28 :25
47	Fiat	Verbeck	3 :52 :56 :15
20	Stutz	Cooper	Did not finish
45	Cole	Bizzard	Out 12th lap
40	Mercer	Hughes	Out 3d lap
31	Knox	Mulford	Out 2d lap

Tetzlaff won first place and $3,500 in addition to the Montmarathon perpetual challenge trophy. Bergdoll won second place and $1,000. Devore won third place and $500.

The free-for-all started at 1:30 Saturday with six cars facing Starter Wagner. The Stutz with Earl Cooper at the wheel got away first and the Pope 30 seconds after. Then with ½-minute intervals followed Devore, National; Mulford, Knox; Tetzlaff, Fiat, and Hughes, Mercer. Cooper made the first 5 miles in 4:30. Tetzlaff made a wonderful start and finished the first 5 miles in 4:11.

Knox an Early Leader

With a phenomenal burst of speed the Knox took the lead in the sixth lap, when it passed the National in the back stretch, which was made in 4:00. Then followed another 5 miles but 2 seconds slower, and in the seventh Mulford made it in 3:55, a new record over a 5-mile course like that at Lake View.

The Flanders special No. 2, driven by Bob Evans, was first away from the wire in the light-car event and was first to finish, although Evans ran 150 miles instead of 100 and in the loss of the count on one lap he was put into third place by mistake. This was eventually straightened out and Evans given first place. Tower in a Flanders was second and Joermann, Maxwell, third.

Somewhat of surprise was the showing made by the little Ford owned and entered by W. C. Baldwin, of Tacoma. Frank Bennett driving made a good run, but twice tire trouble spoiled his chances.

Fine Course Saturday

After the heavy grind the course was subjected to in the first day's events a large crew worked all night and had it in excellent shape for the race on Saturday. The weather warmed up and brought out double the attendance of the first day.

The free-for-all resolved itself into a magnificent contest and a royal one among Tetzlaff in the Fiat, Bergdoll in the Benz and Devore in the National. Although after reaching a leading position in the nineteenth lap Tetzlaff never again dropped into second place, but all three cars were in the same lap for the last 50 miles and there always was a chance

VIEW OF STRAIGHTAWAY ON TACOMA'S 5-MILE COURSE

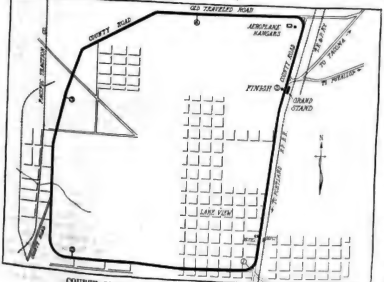
that positions would be altered. Hughes was first off in his wire-wheeled Mercer. The crowd gave him a great send-off and he responded by making the first lap in 4:09. He retained the lead until the third lap, when clutch trouble caused his withdrawal from the race, the third time during the contests.

Bergdoll Takes Lead

As Hughes pulled into the pits he was passed by Cooper in the Stutz, making a 4:19 lap. Cooper held his car there until the eighth, when Bergdoll in the blue Benz rushed by into first place. Cooper succumbed to Tetzlaff in the ninth and held third until engine trouble in the twelfth started a series of delays which placed the Stutz fourth and finally fifth in 20 seconds. From that time on the Stutz ran with consistent smoothness. Cooper had finished his forty-fifth lap when the National crossed the wire in third.

Ralph Mulford shared with Hughes and the Cole the bad luck of the day. The Knox driver received an ovation when he started out and when he made the second lap in 4:05 the crowd was frantic. He never passed the grandstand again, magneto trouble putting his car out.

Tetzlaff won his race on his merits. It is not fair to say he outgeneraled the field, for Bergdoll and Devore both drove magnificent races. Tetzlaff made his first lap in 4:26 and his was the fifth car to leave in the eighth. He caught the National in the stretch and jumped in fourth. After Hughes' retirement he ran third, making his best time, 3:59, in the eighth lap.



COURSE OVER WHICH TACOMA'S RACES WERE RUN

Bergdoll caught the Stutz on the back stretch in the eighth in view of the crowd, with Teddy's Fiat singing loud behind him. The next lap the Fiat swept past the Cole in front of the grandstand and at the end of the eighth was hard after the Benz, then running in first place and making a pretty race. For 50 miles these positions were retained, with the crowd growing wild as it was perceived Tetzlaff was cutting down the seconds.

In the nineteenth lap the excitement grew to fever heat. The Fiat swept past the Benz, which had traveled a slow lap in 5:49, due to tire trouble, and when Bergdoll spent 7:15 on his lap and tire change Tetzlaff lapped him. At this time Tetzlaff pulled in the pit for gasoline and, as fate would have it, had some trouble in getting the car started. Meanwhile the Benz was speeding along, cutting off the lost lap, with the result that the end of the twenty-second lap found the Fiat just 48 seconds in the lead. Tetzlaff never again fell behind.

Benz Has Chain Trouble

When the Benz passed the Verbeck Fiat on the back stretch at 125 miles Tetzlaff's time for that distance was 109 minutes 4 seconds and he was leading by 4 seconds. In the twenty-eighth lap it was noticed the Benz was missing. Chain trouble had delayed him at the bridge for 12 minutes and when he finally passed the grandstand the crowd rose to its feet and gave him a mighty cheer. In the twenty-ninth Tetzlaff came into the pit for tires while the Benz made a 4:17 lap. The Benz after a stop for a broken chain made two good laps in 4:17 and 4:19, but dropped to fourth. In the thirtieth Verbeck was in the pit with engine trouble and Maggio was taken on as mechanician.

The thirty-first lap saw Devore in sec-

ond position and the second Fiat third until its engine trouble when it went again to fourth. In the next two laps Verbeck made 4:18 and 4:05. The thirty-ninth saw a thrilling lap when Tetzlaff pulled up for gasoline. While the fuel was being taken on the red National rushed by with Devore grinning happily. The raw gas in the exhaust pipe of the Fiat caught on fire and before the car was ready to start the Benz rushed past, putting all three cars into the same lap.

Bergdoll was now driving his best and for five laps he and the National had it touch and go. In the forty-fourth Bergdoll made the lap in 4:05 and in the lap following was firmly in second place, which he retained until the finish. He made the best time he could, but Tetzlaff was well away, blazing his trail to the tune of 4:07, 4:06, 4:08 and 4:10, and as the crowd was advised of his progress it rose to its feet and gave the race hero a demonstration as Wagner held the checkered flag for him.

In the forty-fourth Verbeck entered the home stretch just behind the National, swung around it in a wide sweep, followed by the Benz. When he reached the front of the stand Verbeck endeavored to regain the course, but was carried over into the soft dirt near the pits. Just as the crowd held its breath to hear him crash into the pit bars he skillfully brought his car back into the road and was gone.

After this the spectators were frantic and after they had risen and applauded Tetzlaff, the Benz came in for its share. If Tetzlaff was a popular winner Bergdoll also was a great favorite.

All the drivers handled the curves very cautiously in the big event and this pronounced caution explains the very moderate rate of speed averaged even by the winner. Even the fact that it was anybody's race in the last 50 miles did not produce recklessness. This consistency of judgment is what made the Tacoma races remarkable for the lack of catastrophes.

"The Tacoma races were very fast in comparison with many of the records made on famous road courses of the country," said Starter Wagner at the conclusion of the races. "No records were broken, but good time was made throughout, and considering the green condition of the course, the showing was excellent. I will say without any exaggeration, Tacoma has one of the fastest road courses in the world. Better time can be looked for next year."

The success of the meet is due in no small measure to the following officials: Fred. J. Wagner, starter; Robert E. Magner, who handled the Warner timing device; F. E. Edwards, chairman of the technical committee of the A. A. A.; Frank M. Tretwell, referee and A. A. A. representative, and Walter Chandler of Los Angeles, H. C. Mason of Seattle and Harry C. Miller of San Francisco, judges.

With 400 special guards patrolling the entire course, outsiders prevented from approaching within several hundred feet of the track. As a result there was not a single accident.

TACOMA'S FLORAL PARADE

Tacoma, Wash., July 6—The first big event of Tacoma's Montamara festo was the decorated motor parade, headed by the royal car containing Rex Tahoma II and Queen Hazel, and covered with a gorgeous mass of flowers and artificial decorations.

The first prize was awarded to the car of George L. Dickson. In the decorations of this car, to the beautiful floral display, were added many patriotic features. The first prize was $75.

The second prize went to Mrs. Joseph Bachrach, whose touring car was decorated in purple and white. A large canopy of white trimmed with purple flowers made this machine particularly attractive. This entry won the $50 prize.

L. H. Long captured third and the prize of $25, his car being trimmed with pink chrysanthemums. The entry of Garret Fisher, a large paper tiger, carried by his car received honorable mention.

The palm for the best decorated car entered from outside Tacoma was extended the machine of the Seattle Potlatch organization.

PREPARE FOR FARMERS' TOUR

Austin, Texas, July 6—The motor car run from Dallas to San Antonio and return, which is to start July 22 and return to Dallas July 27, to be conducted under the auspices of the Texas Farm and Ranch Publishing Co., of Dallas, is attracting much attention not only among the people of Texas, but other parts of the country. It is the first event in which only farmers and ranchmen living on their own farms and ranches and driving their own cars are eligible as an entrant. The tour will be run under grade 4 of the American Automobile Association 1912 rules with penalties for time only.

The Texas Farm and Ranch Publishing Co. offers $1,000 in cash prizes and a $300 trophy cup for the winners of the tour. The eligible cars embrace any touring car or runabout. Cars are divided into two classes according to body equipment, and then subdivided according to price as provided for in the A. A. A. rules.

The repairs or replacements must be made in the running time of the car, and no allowance in running time will be made for time lost in making such repairs or replacements.

The route is Dallas to San Antonio and return, via Waxahachie, Hillsboro, Waco, Temple, Austin, Taylor, Marlin, Groesbeck and Corsicana. Passengers are to be carried the full route.

OIL COMPANY IN TROUBLE

New York, July 9—A petition has been filed by the Oil Products Co., of New York city, to have the Independent Refiners Sales Co., of the same city, declared bankrupt. The indebtedness of the company is said to amount to about $10,000 and the assets about $6,000. An offer was made recently by the company to pay off the creditors on a percentage basis, but after a meeting it was decided that more money could be obtained by bankruptcy proceedings.

RESULTS IN TACOMA FREE-FOR-ALL RUN ON JULY 6

No.	Car	Driver	5 m.	25 m.	50 m.	75 m.	100 m.	125 m.	150 m.	175 m.	200 m.	225 m.	250 m.
44	Fiat	Tetzlaff	6:27	23:16	43:58	64:51	85:52	111:05	134:02	155:16	185:07	207:47	227:00.45
43	Benz	Bergdoll	5:52	22:44	43:38	64:44	90:19	111:19	144:50	166:27	188:14	209:33	230:49.85
22	National	Devore	6:52	27:22	49:15	71:08	93:26	117:05	143:03	164:55	186:54	210:30	232:28.25
47	Fiat	Verbeck	8:06	21:19	48:31	70:30	92:45	115:29	133:29	170:30	192:11	214:01	232:56.15
20	Stutz	Cooper	4:56	22:14	44:31	71:12	94:02	136:20	163:14	186:06	209:00	231:30	.....
45	Cole	Sebastian	10:25	39:54	82:02	Trouble with new cylinders							
31	Knox	Mulford	7:28	Magneto trouble									
40	Mercer	Hughes	4:29	Clutch trouble									

RESULTS IN THE HEAVY-CAR EVENT RUN AT TACOMA JULY 5

No.	Car	Driver	5 m.	20 m.	40 m.	60 m.	80 m.	100 m.	120 m.	140 m.	160 m.	180 m.	200 m.
33	Fiat	Tetzlaff	6:11:50	18:21:45	34:37:70	51:13:55	67:38:70	84:14:25	100:59:50	119:19:35	137:54:50	156:05:60	174:31:65
31	Knox	Mulford	5:47:75	18:05:10	34:01:05	54:50:90	73:16:75	89:24:65	105:24:60	123:56:91	140:11:55	159:06:55	178:19:15
22	National	Devore	Ran in two events at one time, time recorded in medium heavy car event								149:40:30	168:34:20	185:42:00
11	Mercer	Hughes	7:00:05	20:09:60	37:36:00	54:50:35	72:14:93	89:26:00	106:47:30	122:31:10	144:55:50	Out at 175 miles, broken connecting rod	
20	Stutz	Cooper	Ran in two events at one time, time recorded in medium heavy event.							Out at 170 miles	Carbureter trouble		

Late Happenings in the Trade World

Keeton Company Purchases Seitz Plant in Wyandotte —Its 1913 Plans

DETROIT, Mich., July 9—The Keeton Motor Co. has purchased the plant formerly owned by the Seitz Automobile and Transmission Co. at Wyandotte, Mich., where the manufacture of a six-cylinder machine will be begun immediately, the company having abandoned its original intention of making both fours and sixes. The six will have the same construction and body details as already announced, with the exception that the motor will have a stroke of 5½ inches, this being ¼ inch longer than that originally planned. The bore remains at 3¾ inches. The motor will be a special design and will be made for the company by the Wisconsin Motor Mfg. Co., Milwaukee, Wis., at which plant R. H. Brown, engineer of the Keeton company, has spent the last 6 weeks in directing the preliminary steps in its manufacture.

It is announced that H. D. W. Mackaye has just been made assistant to President Keeton. A branch factory has just been established at Brantford, Ont., to take care of Canadian business, an option on the property there having been secured about 2 months ago. Within the week Keeton agencies have been established at Baltimore, Atlantic City, Plainfield, N. J., Portland, Ore., Boston and Buffalo.

The output from the Wyandotte plant for the coming year is estimated at 1,200 cars, while the Brantford factory is to turn out 300. First deliveries will be made about August 15, although one car will be shipped to the New England branch next week.

H. L. Winter, formerly sales manager of the Federal Motor Truck Co., has taken the position of general sales manager with the Universal Motor Truck Co. He left today for an extended trip to the various branches and agencies of the company for the purpose of getting acquainted with selling conditions in the different sections and to gain an idea of the possibilities for future business. D. K. McBride, of the Universal company, has been promoted to factory manager.

Henry Ford and family will leave the city on Thursday, sailing for Europe from New York city on Saturday.

J. T. Langhorn has resigned as manager of the truck department of the Packard Motor Car Co.

WOULD SELL ATLAS PLANT

Indianapolis, Ind., July 9—A petition has been filed in the superior court by Fred C. Gardner, receiver for Atlas Engine Works, asking permission to sell the property. The petition will be passed on Thursday. Gardner says the liabilities exceed $1,000,000 and that it would be impossible to obtain sufficient money to operate the plant and that to close the plant would mean considerable loss. An inventory of the company's property has not been completed. The receiver has been authorized by the court to borrow $25,000 to meet the payroll and for current expenses.

LIPPARD CHOSEN PRESIDENT

Buffalo, N. Y., July 8—At a special meeting held last week by the directors of the Stewart Motor Corporation, just incorporated here with a $250,000 capital, T. R. Lippard was chosen president and general manager of the new concern, while R. G. Stewart was selected as vice-president and chief engineer. R. P. Lentz, of Hartford, Conn., was chosen treasurer and secretary, while Robert W. Ingersoll, manager of the Firestone Tire & Rubber Co. of Buffalo, will be sales manager for the new concern.

The latest addition to Buffalo's motor car industry has leased the large plant formerly occupied by the Niagara Machine & Tool Works at Jefferson, Superior and Randall streets, for the transaction of their business. The new corporation also will occupy the four-story brick structure adjoining this plant and the power plant in the rear. Extensive improvements and alterations are being made on the building, and orders are being placed for new equipment and machinery. However, the business already has opened and offices are at 1056 Ellicott square.

MATHESON AFFAIR CLEANED UP

New York, July 8—Two years ago when the Matheson Automobile Co. extended its capital to $2,650,000 and took in the Matheson Motor Car Co., which was at that time in the hands of a friendly receiver as the result of a suit in equity brought by F. M. Quimby et al., about 2 per cent of the creditors did not immediately obey the court order, which declared for an adjustment on a basis of 50 per cent stocks, 25 per cent bonds and 25 per cent cash. These creditors held back with an idea of obtaining all cash. The accounts have now been cleaned up and the receivers are to be dismissed. The Matheson Automobile Co. has been uniformly successful and have been working continually on a sound financial basis.

RESULTS IN TACOMA MEDIUM-HEAVY CAR EVENT RUN JULY 5

No.	Car	Driver	5 m.	15 m.	30 m.	45 m.	60 m.	75 m.	90 m.	105 m.	120 m.	135 m.	150 m.
20	Stutz	Cooper	4:30:30	13:16:95	26:27:20	39:37:35	52:37:65	65:37:55	79:31:05	92:51:35	106:39:10	122:37:00	135:00:00
22	National	Devore	5:24:65	13:43:60	26:08:35	38:53:35	51:38:85	68:45:55	81:37:35	99:05:95	115:07:70	128:03:95	141:10:15
21	Pope-Hartford	Rossi	5:26:60	14:57:35	28:55:50	43:08:60	57:21:25	71:13:85	85:23:25	99:38:45	118:31:20	132:50:95	146:53:70

RESULTS IN TACOMA MEDIUM-CAR EVENT RUN JULY 5

No.	Car	Driver	15 m.	30 m.	45 m.	60 m.	75 m.	90 m.	105 m.	120 m.	135 m.	150 m.
12	Mercer	Ruhlem										
10	Mercer	Berndoll		30:14	44:28	58:70	73:00	87:31	102:04	116:40	131:17	145:13.00
11	Mercer	Hughes	53:43	67:52	Trouble with shifting lever—broke universal joint							
14	Cole	Sebastian	13:23	26:20	39:17	55:27	Clutch trouble					
			10:34	Burnt out—broke connecting rod								

RESULTS IN TACOMA LIGHT-CAR RACE RUN JULY 5

No.	Car	Driver	10 m.	20 m.	30 m.	40 m.	50 m.	60 m.	70 m.	80 m.	90 m.	100 m.
2	Flanders Special	Evans										
5	Flanders Special	Tower	11:00		30:23	40:02	49:41	59:26	69:05	78:45	88:22	98:20.00
4	Maxwell	Jaermann	12:03	21:41	31:25	41:01	50:42	60:18	70:03	79:49	89:30	99:04.35
3	Ford	Bennett	12:06	22:09	32:15	42:14	52:17	62:08	72:11	82:10	92:16	102:19.50
6	Oakland	Barnes	12:11	22:31	32:50	43:10	53:42	76:39	87:06	97:31	108:01	118:30.00
			16:38	32:06	42:57	56:29	68:39	81:42	92:00	102:22	112:51	123:15.55

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Special Motors for Trucks

THE points of discussion brought out at the recent midsummer session of the Society of Automobile Engineers on the subject of suitable motors for trucks showed conclusively the enormous strides that have to be made in the truck industry before it reaches the relative position that the touring car motor is in today. The motor for trucks must be a different power plant than the one for pleasure cars because the service is different, conditions are different and drivers are different. The pleasure car motor works but a very small percentage of the time, only a few hours per day, whereas the truck motor may work continuously 10 or 12 hours daily. This continuous service calls for a much more robust type of motor than is needed in the pleasure car field and those truck makers who have used the pleasure car motors are making an error unless the pleasure car motor was really more intended for truck work than for the pleasure car field, which is the case in one or two instances.

THE truck motor of today is a widely-varying one so far as capacity is concerned. One concern uses a 5 by 5 motor on a 3.5-ton truck and another company uses one scarcely 4 by 4. This is a tremendous difference, and if the truck design is correct there is not any necessity for such a difference in motor sizes. The only answer is that one truck is overpowered and the other properly powered, or it may be underpowered. Overpowering a truck motor is a serious question. When there is an overabundance of power there is certain to be overspeeding and overloading. Numerous examples of this are met with daily. One dealer of trucks tries to make sales on the percentage of overload that his machine will take care of and this fact alone makes it imperative for the other dealer to talk overload and overspeeding. There are cases on record where trucks have been sold only on overload performances. The purchasers wanted a 50 per cent overload. He would not buy under other conditions. The big motor made the big overload possible, and yet this big motor also made the heavy maintenance bills a reality. There is more trouble today in the truck field due to too much power than to not enough power.

FOREIGN trucks use immeasurably smaller motors than do American trucks of equal load carrying capacity. Abroad the cost of fuel has been one reason for reducing the size, the horsepower tax has been another, but it is questionable if neither of these factors had existed if the use of the small motor would not have come practically as fast. The small motor makes it almost impossible to abuse the truck, whereas the high-powered motor will soon rack the vehicle if the driver gives the motor its speed. What is needed is a specially built truck motor, one with a governor, one with very heavy crankshaft, camshafts and crankcase ports and ample bearing surfaces for the crankshaft and also both ends of the connecting rods. These parts must be much heavier in a truck motor than if used in a pleasure car motor with cylinders of the same size.

THE truck motor is in reality a portable power plant, and must be considered and treated as such. The designer who expects to develop racing speed as well as constant service for 15 hours per day will meet with disappointment. The motor in the pleasure car is the speedy blood horse, whereas the truck motor must be the heavy, certain and more ponderous draught animal. Their fields are different, and so their make-up must be different.

Recklessness and Accidents

EVERY day the press contains accounts of motoring accidents, many fatal and others in which the victims are maimed for life. A large percentage of these accidents is in cities on streets where there is not the slightest cause for such accidents. There is only one cause for them, and that is recklessness. Joy riding is responsible for many of these affairs, which cast an unfavorable shadow over the industry. In many cases after the car has been taken out by the chauffeur, without the owner's permission, the latter prefers to let the matter pass rather than prosecute the offending chauffeur, who may have been seriously injured in the affair. Only one solution remains, and that is the court investigating every case in which accidents happen and seeing if there has been any violations of the owner's permission rule.

SO numerous are these accidents becoming in several cities, and so entirely uncalled for, that it creates a suspicion of fear with the owner who drives his own car and is competent to the extreme, but who endangers himself every time he goes about by not knowing what the reckless, irresponsible driver is going to do. It is not what the owner may or may not do, but what the irresponsible driver will do. He is the quantity to be feared. The driver who takes chances at night by not slowing up for street car intersections and eventually gets caught is an injury to the community and is as much an offender of the law as the person who makes himself a nuisance on the sidewalk and is arrested. There are nuisances on the public highway as well as in public parks, in public buildings, and in public thoroughfares. The police should use extra surveillance with such characters. It rarely happens that a reckless driver graduates in his reckless role in a single evening; he has had a long training career and, while he has fortunately escaped accidents for months or perhaps years, it is only a question of time until his turn will come, because nothing else could possibly be his fate. With such cases it is possible for authorities to intervene before the fatal crash comes. Were such characters always alone the case would have a different appearance, but others enthrust themselves into their hands, often with fatal results.

THE police of the various cities could do much to stamp out recklessness in driving. They see many examples, a large percentage of which pass almost unnoticed because the accident is missed by a hair's breadth on that occasion. If the present number of accidents increases the municipal authorities will be investigating, and harsher and more ridiculous speed laws and other regulations will be the result. It is not a question of more law, but stricter observance of the wording and spirit of the existing laws. There are nearly every day being committed in our cities fool-hardy acts with motor cars which warrant depriving the driver of his license for a period of 30 or 60 days. Deprivation is the one strong arm to reduce accidents. Accidents will also be reduced if a thorough investigation is made of every one and if the guilty parties, whether injured or not, are punished by way of losing their license or cancellation of the car license for a short period. It is imperative on the motorists, and also on the police, to act in these matters. In one eastern state where the authorities have cancelled owner's driving privileges or car license for accidents the results have been most satisfactory, and the example should be followed in other cities.

Control of Guayule in Madero's Hands?

Aldrich-Rockefeller Interests Said to Have Been Sold to Mexican Chief

TORREON, MEXICO, July 6—It is reported here on trustworthy authority that the Intercontinental Rubber Co., which is owned by the Aldrich-Rockefeller interests, has disposed of all its guayule rubber factories and lands upon which that shrub grows in Mexico, the purchasers being Gustavo Madero and other members of that family.

It is known that negotiations looking to the consummation of this transaction have been in progress for several weeks, Mr. Madero having recently visited the United States, where he conferred with representatives of the Intercontinental Rubber Co. in reference to the purchase of the latter's properties. The consideration is upwards of $30,000,000 gold, which represents about the original investment of the Aldrich-Rockefeller syndicate in the rubber industry in this country.

The long protracted revolutionary disturbances in the Torreon district and the losses which the Intercontinental Rubber Co. has sustained through the forced closing down of its rubber producing plants and interference with the cutting of the shrub upon its ranches are said to have been somewhat responsible for its determination to close out its Mexico holdings.

There is another side, however, to this story. As is well known, the Madero family has been, ever since the beginning of the guayule rubber industry, the largest producer, next to the Intercontinental Rubber Co., of crude rubber in Mexico. This family, to which President Francisco I. Madero, Jr., belongs, owns several guayule-producing factories and more than 15,000,000 acres of land upon which the guayule shrub grows. From the standpoint of available output of the shrub the Maderos were far better off than the Intercontinental Rubber Co. The latter concern, besides owning a rubber factory at Torreon, which cost approximately $5,000,000 gold, also owned three small factories scattered through the guayule shrub growing region of this part of the country. Its holdings also embraced the Cedros ranch in the state of Zacatecas, embracing 2,000,000 acres. This property has been brought up to a high standard of guayule shrub production through the cientific methods adopted by the com- any. It already has had an enormous utput of the raw material and is said o possess resources in this line that will ontinue indefinitely by means of rota- on in planting.

According to the story that is told here the circumstances leading up to the le of the Intercontinental Rubber Co. its guayule holdings to the Maderos, came to the knowledge of the Aldrich- ckeller syndicate that legislation im- ing heavy taxes and other burdens n the industry were about to be inaugurated by the federal government, one of the proposed measures being that of imposing a heavy tax upon the guayule shrub land, which is now practically free from taxation. It being within the power of the Madero family, which is now practically in control of the federal government, to control the guayule rubber industry in any manner that it might see fit, the Intercontinental Rubber Co. decided, it is said, that it was best to retire from the field while it was possible to obtain a fair return on its investment.

This transaction places the Maderos in full control of the guayule rubber industry, which has grown to enormous proportions in northern Mexico during the last few years, the annual exportation of crude rubber from this source aggregating approximately $60,000,000 gold in value.

New York Denies Deal

New York, July 9—William C. Potter, president of the Intercontinental Rubber Co., brands as absolutely without any foundation a report that the Madero interests have obtained control of his concern.

"I cannot understand where such a report could have originated," said Mr. Potter. "There is going to be no change in this company's management for the present, and nothing in the way of any change in the near future is even contemplated. We are on the best of terms with the Maderos, and there is therefore no reason to believe that they would try to force us out, now that they are in control of Mexico."

Coming Motor Events

*July 13—Hill climb; Forestville, N. Y.

*July 15—Reliability run; Wisconsin State Automobile Association.

July 8-13—New York motor car carnival.

*July 15-18—Cleveland News reliability run.

July 11—Automobile Board of Trade meeting; New York.

July 15-20—Reliability run; Wisconsin State Automobile Association, Milwaukee, Wis.

July 21—Track meet; St. Louis, Mo.

*July 22—Farm and ranch tour; Dallas, Texas.

July 22-27—Cadillaqua celebration at Detroit, Mich.

August 5-7—Pacific Highway convention; San Francisco, Cal.

August 8-9—Banta trophy team match, Chicago Motor Club.

*August 8-10—Galveston beach meet; Galveston, Tex.

August 10—Hill climb; Whittier, Cal.

*September—Commercial vehicle run; Chicago Motor Club.

September 2—Track meet at Winnipig, Canada.

September 3-6—Chicago Motor Club's truck demonstration.

September 17 — Grand Prix; Milwaukee, Wis.

September 20 — Wisconsin challenge and Pabst Trophy races; Milwaukee, Wis.

September 21—Vanderbilt road race; Milwaukee, Wis.

September 17-20—Fire engineers' convention; International Association Fire Engineers, Denver, Colo.

September—Track meet; Universal Exposition Co., St. Louis, Mo.

*Cctober 7-11—Chicago Motor Club reliability run, Chicago.

October 12—Track meet; Rockingham park, Salem, N. H.

November 6—Track meet; Shreveport Automobile Club, Shreveport, La.

*Sanctioned by A. A. A.

SHOWS

July 10-20—Canadian Industrial Exhibit; A. C. Emmett, manager motor section; Winnipeg, Can.

September 23-Oct. 3—Rubber show, Grand Central palace, New York.

September 26-Oct. 6—Exposition agricultural motor cars, Bourges, France.

November 8-16—Olympic show; overflow November 22-30 Agricultural Hall.

December 7-22—Paris salon.

January 4-11, 1913—Cleveland show.

January 11-18—New York show.

January 11-22—Brussels, Belgium show, Centenary Palace.

January 20-25—Philadelphia show.

Jan. 27-Feb. 1—Detroit show.

February 1-8—Chicago show.

February 10-15—Minneapolis show.

February 17-22—Kansas City show.

Feb. 21-March 1—St. Louis show.

March 3-8—Pittsburgh show.

March 8-15—Boston show.

March 17-22—Buffalo show.

March 19-23—Boston truck show.

March 24-29—Indianapolis show.

COAST TOURISTS REACH BUFFALO

Buffalo, N. Y., July 8—Dr. S. S. Crow and A. G. Faulkner, both of Los Angeles, resumed their transcontinental trip from Los Angeles to New York City in their 48-horsepower Pierce-Arrow runabout this afternoon. The motorists left Los Angeles on June 5 and have spent only 15 days on the road, an average daily mileage of 200 miles. During the other day they visited relatives and friends in various cities where they stopped. A feature of the trip is that not a single accident has marred the progress of the runabout, although the motorists ran short of gasoline several times, and one dealer on the road charged them 70 cents a gallon for gasoline, but he had to haul it across a desert from the nearest railroad, which was some thousand feet distant. Saturday afternoon the travelers visited the local Pierce-Arrow factory in Elmwood avenue.

WOLVERINES TALKING CLUBHOUSE

Detroit, Mich., July 8—A special meeting of the Wolverine Automobile Club, of this city, has been called by President Harry Porter for Wednesday in the convention hall of the Pontchartrain hotel, this rendezvous being chosen because a gathering greatly in excess of the accommodations afforded in the present temporary quarters of the club is expected. Final action will be taken on the details in connection with the plans for the new home of the club, the building of which will be commenced soon.

French Praise Driving of Bruce-Brown

BAILLOT BEING ESCORTED TO TRIBUNE OF HONOR—BAILLOT TRYING TO START MOTOR SECOND DAY—BAILLOT PUSHING CAR OUT OF NIGHT GARAGE

Although American Did Not Win Grand Prix, His Skill at Wheel Stirs Foreigners—Broken Gasoline Feed Pipe Cause of New Yorker's Trouble—Aftermath of Great International Road Race

PARIS, June 28—The breakage of a gasoline feed pipe on the fourteenth round of the race, immediately after a neck and neck struggle with Boillot in the Peugeot, caused David Bruce-Brown to lose the French grand prix. All through the first day the Frenchman had chased the American, finishing only 2 minutes, 3 seconds behind him. In the second day, when all the cars were pulled out on the course by hand, and cranked and replenished after the official start was given, Bruce-Brown made one of the most brilliant displays ever seen in a European race, his time for the complete round, including starting up a cold motor, going to the pits and taking tires and gasoline, occupying only 47 minutes, 47 seconds, compared with 36 minutes, 32 seconds for his record round with a flying start.

Instead of 4 minutes in getting away, as anticipated, Boillot occupied 14 minutes. His mechanic could not crank the motor; Boillot could do no better. An examination showed that during the night, while the cars had been housed in a rather flimsy shed, rain had passed through the hinge in the bonnet and got on and around the spark plug set in the head of the cylinder. When this had been dried out Boillot got away in chase of Bruce-Brown and Wagner in the Fiats, both of whom were ahead of him in road position and the former leading on time. Boillot drove with such dash that his actual disadvantage of 9 minutes at the start had been pulled down to 1 minute, 25 seconds after two rounds had been covered.

Brown Upsets Boillot's Plans

During the first day the Frenchman had kept his car well in hand, his plan being not to exceed 38 minutes for a round, pushing to his maximum speed of 35 minutes per round on the second day, if necessary; Bruce-Brown's dash made it necessary. Boillot doubtless had the slightly faster car, for on the dead straight highway after St. Martin, he closed up on Bruce-Brown and passed him, both cars at the time going at more than 95 miles an hour. Boillot being anxious to see how his rival would take it, glanced back as soon as he had pulled in to the right-hand side of the road and by so doing got his right wheels on the edge of the grassy bank. To save himself, he had to cut out the ignition. Taking advantage of the mistake, Bruce-Brown roared past, and as the Dieppe fork was less than a mile ahead the American got around it first and with his better accelerating powers pulled away from Boillot. The Fiat needed replenishing at the pits, ¾ mile from the fork, while Boillot went through without stopping. The Peugeot was thus first in road position and first in elapsed time.

American Out of It

On the following round, when at the top of the long descent to Sept-Meules, down which the Fiats and Peugeots had roared at 125 miles an hour, Boillot observed the Fiat in the hollow below. The gasoline feed pipe had broken and before the car could be stopped so much gasoline was lost that it was impossible to continue. The spare line was connected in position, but gasoline had to

GRAND PRIX FINISHERS

Car and Driver	Time	M. P. H.
Peugeot, Boillot	13:58:02	68.7
Fiat, Wagner	14:11:08	67.5
*Fiat, Bruce-Brown	14:28:13	65.0
Sunbeam, Rigal	14:38:36	64.8
Sunbeam, Resta	14:39:51	64.7
Sunbeam, Medinger	15:59:41	59.9
Excelsior, Christleans	16:23:38	58.3
Schneider, Croquet	17:31:39	51.5
Rolland-Pilain, Anford	17:49:32	53.6
Arrol-Johnston, Wyse	18:07:19	52.7
Alcyon, Duray	18:28:55	51.7
Vinot, Volatum	19:06:00	50.0
Mathis, Esser	20:18:05	46.1
Cote, De Vere	20:57:06	44.3

*Did not finish officially

be obtained from outside and according to the rules this entailed disqualification. As Boillot swept by, Bruce-Brown waved his arm in a manner which indicated "Go ahead and win; it is all up with me."

Easy Victory for Boillot

Boillot did get ahead and win, for he had a lead of 25 minutes on Wagner's Fiat. On the eighteenth round, however, it looked as [illegible] he might lose the race. He had been changing gears without declutching, owing to a slight defect in the clutch; this brought about the bending of his selector rods, which had to be straightened out with a lever. While making this repair it was discovered that the aluminum housing on the rear universal joint had been broken by a flying stone, allowing the oil to run out and causing the universal to partially seize. Boillot took down the housing, filled it with grease, and put it back again with the hole at the top. The work occupied 20 minutes during which time Wagner shot ahead and actually finished the race first, but he could not wipe out the loss from the previous day.

Boillot finished fast with the use of practically only his high gear. He could use second, but as it was very difficult to get from second into fourth, he preferred to keep on direct drive. This slowed him on the hills, but he ran the faster on the level and maintained his average.

French motorists were astounded at the dash and vim of Bruce Brown. Talking to Motor Age representative, Boillot declared: "Bruce-Brown is extraordinary, he is the finest race driver I ever have seen. I know of no man who can approach him. He also is one of the squarest, most honest and loyal competitors I ever met. When he saw that an accident had put him out of the race he just urged me on to win in an open, generous manner, although one of his own teammates still was in the race. On the road he drove fiercely, but he was full of consideration for the little fellows. He gave them plenty of room; he did not try to hound them off the course. I should have liked to have seen him win the race."

WAGNER, SECOND IN GRAND PRIX, PASSING GRAND STAND

Brown an Unofficial Third

Bruce Brown continued and was officially timed, but does not appear in the official classification, as his time at the end was only 20 minutes, 11 seconds, slower than that of Boillot, notwithstanding a long stop at the pits to explain that he had taken gasoline, it is possible that he might have won if fuel could have been taken at any point and a neck and neck contest would have ensued if he had not broken his gas line.

Bruce-Brown's superiority showed up at the pits. The plan was for both men to leap out simultaneously as soon as the car stopped. Bruce-Brown would seize the 10 gallon cans of gasoline from the pit, dump them into the big funnel, handling the cans as if they were pound weights; meanwhile the mechanic swung out the used tires from the rear, rolled the new ones in. Brown would vault into his seat from the steering wheel side, and while the car was moving the mechanic scrambled up over the tires to his place and fastened down the filler cap while running. The motor never was stopped at the pits, a combined pressure and gravity feed enabling it to run when pressure was off the tank. The work was carried out with the fury of demons but never once was a slip made, and never did one man get in the way of the other. On all hands it was admitted that such a display never had before been witnessed in Europe.

Work at the Pits

Peugeot was well organized at the pits, but the execution was far from equalling that of Bruce-Brown. Gasoline and oil were supplied under pressure through long pipes. On one occasion the pressure was turned on too soon; on another Boillot turned off the flow twice before being sure that his tank was full.

BRUCE-BROWN AND MECHANIC GOING TO TAPE ON MORNING OF SECOND DAY

the car, together with his mechanic.

De Palma did not equal Bruce-Brown as a driver, but his elimination was only caused by the loss of his gasoline and the taking of a fresh supply away from the pits, this entailing disqualification. Goux, in the Peugeot also was disqualified for the same cause. Zuccarelli, the third Peugeot driver had a leaky water outlet pipe. He changed it at the pits, but the second also was defective, allowing his water to escape and his motor to overheat at a point where it was impossible to obtain more.

Excelsior Does Well

The six-cylinder Excelsior, although not a special racing model, performed well, its only defect being a slipping clutch which kept it back during the early portion of the race. The Lorraine-Dietrichs were failures. Hemery and Heim both went out at an early hour with cracked cylinders. Bablot had valve trouble and Hanriot's car caught fire and was not started on the second day.

Of the two Rolland-Pilain big cars, Guyot's mount was eliminated early with a broken connecting rod. Anford, or Fauquet, under his family name, drove well on the first day, but when starting up from cold on the second day flooded his motor with gasoline. To clear it out he removed the plugs, then mixed up the ignition wires. Finally he was called off Pilain and Guyot taking their places.

In the 183-inch section the English Sunbeams were undoubtedly the best. Coatelen, the designer, had adhered pretty closely to his standard model and had tuned up his car for 2 months on the road with the help of Rigal and Caillois, both experienced race drivers. They also received valuable help in this connection from Claudel, the carbureter manufacturer. The Sizaire-Naudins were lacking in preparation; the Alcyons had minor troubles and the Vauxhalls, although fast, were unable to stand the distance.

On the whole cars were eliminated by minor rather than radical defects. The only cases of overheating were the Dietrichs. In two cases sufficient protection was not given to the gasoline tanks. In two others base plugs dropped out of the crank-chambers, allowing the oil to escape. In the motors the weakest points were connecting rods and pistons, there being but one case of main bearings having run dry through insufficient lubrication. Detachable wire wheels stood the strain as did the Michelin wood over with detachable rims. Some of the pressed steel detachable wheels fell to pieces.

MILWAUKEE AFTER FOREIGNERS

Milwaukee, Wis., July 7—A campaign to secure a really representative field of foreign-built cars and foreign-born drivers for the grand prix race in Milwaukee on September 17 is now being made by a special committee of the Automobile Club of America through its European representatives, the Automobile Clubs of France, Italy, Belgium, Switzerland, Canada, Austria and the R. A. C. of Great Britain and the Kaiserlicher of Germany.

Cable advices received by Bart J. Ruddle, race secretary for the Milwaukee Automobile Dealers' Association, through the

INTAKE SIDE PEUGEOT MOTOR

TABLE SHOWING HOW THE CARS PERFORMED IN THE GRAND PRIX ROAD RACE PROMOTED BY THE AUTOMOBILE

Driver and car	1	2	3	4	5	6	7	8
Boillot, Peugeot	:38:40	1:16:32	1:57:40	2:42:09	3:21:24	4:01:47	4:41:24	5:23:22
Wagner, Fiat	:41:15	1:19:40	1:58:53	2:37:52	3:22:02	4:00:35	4:40:17	5:38:18
† Bruce-Brown, Fiat	:37:18	1:16:19	1:54:44	2:32:48	3:14:54	3:54:31	4:33:38	5:10:10
Rigal, Sunbeam*	:42:10	1:27:32	2:10:41	2:53:21	3:39:27	4:27:52	5:10:27	5:52:20
Resta, Sunbeam*	:42:16	1:24:05	2:06:52	2:53:55	3:37:53	4:19:16	5:04:47	5:46:03
Medinger, Sunbeam*	:42:33	1:29:48	2:13:05	2:50:03	3:39:28	4:25:34	5:08:30	5:55:48
Christiaens, Excelsior	:40:47	1:21:21	2:20:07	3:05:10	3:47:06	4:47:46	5:46:33	6:29:25
Croquet, Schneider*	:51:36	1:43:18	2:35:03	3:26:29	4:18:00	5:09:26	6:35:00	6:55:03
Anford, Rolland-Pilain	:46:58	1:30:09	2:13:02	2:55:51	3:39:10	4:25:10	5:08:59	5:52:00
Wyse, Arrol-Johnston*	:54:05	1:46:07	2:38:04	3:30:35	4:22:37	5:15:23	6:08:10	7:00:24
Duray, Alcyon*	:48:21	1:35:45	2:21:51	3:07:14	3:54:02	4:43:17	5:31:37	6:16:26
Vonlatum, Vinot*	:51:43	1:42:38	2:33:10	3:24:36	4:17:29	5:23:44	6:24:01	7:19:16
Esser, Mathis	:58:16	1:55:18	2:51:02	3:56:14	4:52:48	5:49:29	6:51:37	7:50:08
De Vere, Cote*	:56:15	1:57:00	2:50:11	3:49:55	4:47:34	5:45:19	7:23:20	8:23:40
Lambert, Vauxhall*	:52:21	1:40:33	2:27:52	4:11:35	4:50:07	6:46:13	7:41:51	8:20:45
Crossman, Arrol-Johnston*	:58:45	1:55:18	2:52:32	3:51:35	4:50:02	5:57:19	7:19:44	8:16:25
Page, Alcyon*	:48:42	1:36:27	2:24:21	3:11:47	3:58:55	4:52:35	5:42:36	6:29:49
Hancock, Vauxhall*	:45:08	1:27:47	2:10:14	2:52:13	3:33:58	4:18:37	5:01:26	5:49:22
Sizaire, Sizaire-Naudin*	:48:52	1:36:49	2:25:13	3:13:27	4:02:01	4:50:20	5:40:26	6:40:32
Garcet, Calthorpe*	:47:27	1:35:12	2:22:53	3:05:14	3:58:58	4:49:39	5:37:48	6:30:22
Goux, Peugeot	:40:16	1:18:49	3:43:05	4:27:16	5:07:01	5:55:17	6:36:13	7:24:51
De Palma, Fiat	:41:29	1:23:11	2:06:07	2:51:42	3:35:38	4:19:12	5:10:30	5:50:06
Hanriot, Dietrich	:44:21	1:25:33	2:06:56	2:52:40	3:37:28	2:23:58	5:16:53	6:17:39
Romano, Gregoire*	:48:26	1:36:31	2:23:52	3:16:44	4:04:21	4:51:11	5:39:01	6:36:30
Renaux, Gregoire*	:51:00	1:39:34	2:28:19	3:17:08	4:06:15	4:55:01	5:43:50	6:31:33
Schweitzer, Sizaire*	:52:45	1:44:30	2:00:15	3:30:03	4:21:52	5:16:50	6:40:24	7:37:43
Lucien Morne, Vinot*	:50:04	1:38:17	2:36:26	3:13:49	4:00:57	4:51:21	5:37:41	6:32:32
Barriaure, Alcyon*	:48:18	1:38:18	2:22:11	3:08:46	3:55:26	4:43:42	6:02:53	6:52:01
Caillois, Sunbeam*	:44:28	1:29:51	2:15:32	2:59:13	3:42:15	4:19:01	5:40:37	
Bablot, Dietrich	:45:50	1:29:51	2:10:40	2:51:06	3:48:23	4:36:02	6:02:09	
Thomas, Lion Peugeot	:49:55	1:38:34	2:21:55	3:08:46	3:57:12	4:47:10	5:33:32	
Zuccarelli, Peugeot	:58:01	1:38:34	2:18:50	2:58:41	3:57:29	5:40:14	6:20:31	
Naudin, Sizaire-Naudin*	1:05:33	1:53:57	2:41:20	3:28:27	4:16:06	5:03:55	5:53:49	
De Marne, Gregoire*	:47:56	1:34:28	2:21:21	4:04:21	5:42:45	6:29:14	7:37:21	
Rollason, Singer*	:46:50	1:33:22	2:20:41	3:07:14	3:56:16	4:54:12		
Haywood, Singer*	:49:18	1:40:54	2:29:46	3:17:23	4:04:49			
Hornsted, Calthorpe*	:51:34	1:41:35	2:33:39	3:25:04	4:16:16			
Leon Molon, Vinot*	:49:37	1:38:13	2:27:23					
Champoiseau, Schneider*	:48:00	1:36:14	2:25:42	3:13:43				
Watson, Vauxhall*	:42:57	1:26:20						
Colinet, Gregoire*	:45:17	1:33:16						
Burgess, Calthorpe*	5:10:46	6:02:18	6:50:19					
Hemery, Dietrich	:39:00	Cracked cylinder						
Heim, Dietrich	:40:26	Cracked cylinder						
Gabriel, Cote*	1:00:20	Universal joint						
Guyot, Rolland-Pilain	1:22:59	Broken connecting rod						

* 183-inch class

† Bruce-Brown disqualified; time does not count

FRONT VIEW PEUGEOT MOTOR

New York club, indicate that there are excellent chances that Georges Boillot, winner of the French grand prix, June 25 and 26, will bring his Peugeot to America to compete at Milwaukee. Likewise hopes are given that Victor Hemery will come over with a Lorraine-Dietrich, while it is sure that Louis Wagner will drive one of the three Italian Fiats which will be entered, the team which worked together in the Dieppe race to be kept intact for the Milwaukee event: Bruce-Brown, de Palma and Wagner.

Entries for the grand prix close on September 10, and more than 1,000 blanks have been mailed from Milwaukee headquarters. There has been a slight change made in the conditions for the running of the grand prix, the distance being cut from fifty laps to forty-seven laps of the 8.725 mile course, making the mileage of the feature event 409.075 instead of 436.25 as originally announced.

The general conditions of the race include the following: American and foreign cars shall be eligible to compete, but not more than three cars of one make may be entered. If the number of cars en-

GRAND PRIX CYLINDER DIMENSIONS AND WEIGHT

No.	Car	Weight Unloaded Pounds	Cylinder Area Cubic Inches	Wheel Base Inches	No.	Car	Weight Unloaded Pounds	Cylinder Area Cubic Inches	Wheel Base Inches
40	Alcyon	2242	182.23	103	55	Arrol-Johnston	2194	181.49	112
4	Alcyon	2253	182.23	104	29	Cote	2304	182.23	102
27	Alcyon	2414	182.23	105	41	Cote	2315	182.23	102
3	Sunbeam	2002	182.23	106	33	Vauxhall	1933	181.31	107
16	Sunbeam	2013	182.23	107	51	Vauxhall	1896	181.31	107
17	Sunbeam	2034	182.23	107	54	Vauxhall	1914	181.31	107
52	Sunbeam	2015	182.23	95	47	Lion-Peugeot	1896	181.92	101
7	Sizaire	2385	181.92	121	11	Lorraine-Dietrich			105
38	Sizaire	2407	181.92	121	31	Lorraine-Dietrich			104
19	Sizaire	2315	181.92	120	34	Lorraine-Dietrich			104
8	Vinot	2231	182.23	111	57	Lorraine-Dietrich			105
32	Vinot	2187	182.23	111	12	Mathis			98
56	Vinot	2183	181.23	110	13	Peugeot			109
18	Gregoire	1797	181.49	115	22	Peugeot			109
24	Gregoire	1862	181.49	114	45	Peugeot			109
10	Gregoire	1823	181.49	114	23	Fiat			107
21	Gregoire	1830	181.49	114	37	Fiat			107
14	Calthorpe	2094	181.31	104	42	Fiat			107
26	Calthorpe	2094	181.31	104	30	Rolland-Pilain			109
43	Calthorpe	2116	181.31	103	49	Rolland-Pilain			111
25	Singer	2469	182.23	107	50	Excelsior			116
39	Singer	2513	182.23	106	9	Schneider	2138	181.43	101
28	Arrol-Johnston	2127	181.49	105	20	Schneider	2189	181.92	109
36	Arrol-Johnston	2158	181.49	105					

CLUB OF FRANCE AND RUN OVER CIRCUIT AT DIEPPE WHICH RETURNED AS WINNER BOILLOT IN A PEUGEOT

9	10	11	12	13	14	15	16	17	18	19	20
6:01:03	6:38:40	7:30:58	8:09:18	8:49:03	9:28:59	10:09:15	10:48:35	11:32:56	12:38:19	12:16:53	13:58:02
6:21:20	7:03:12	7:49:24	8:31:05	9:16:20	10:01:18	10:40:44	11:19:39	12:01:19	12:44:54	13:30:03	14:11:08
5:57:18	6:36:37	7:24:24	8:07:53	8:49:52	9:54:23	10:48:56	11:46:35	12:24:08	13:05:38	13:45:11	14:28:13
6:30:38	7:14:22	8:13:53	8:56:53	9:40:27	10:25:24	11:05:58	11:49:00	12:33:49	13:15:25	13:57:04	14:38:36
6:25:48	7:10:14	8:02:58	8:46:08	9:29:29	10:12:50	10:54:17	11:43:51	12:28:47	13:13:10	13:55:54	14:39:51
6:28:18	7:33:19	8:44:40	9:36:05	10:25:22	11:11:14	12:00:28	12:47:05	13:32:58	14:18:09	15:09:32	15:59:41
7:21:16	8:10:22	9:10:43	9:55:25	10:39:30	11:31:13	12:16:09	13:21:16	14:06:53	14:52:01	15:37:15	16:23:38
7:47:55	8:37:55	9:34:34	10:43:43	11:34:04	12:25:06	13:15:49	14:06:50	14:57:59	15:49:02	16:41:29	17:31:39
6:34:42	7:21:09	9:10:36	9:54:48	11:27:20	12:27:03	13:17:30	14:08:48	14:51:05	15:54:32	16:53:33	17:49:39
7:37:02	8:57:32	9:54:40	10:46:39	11:39:17	12:40:29	13:33:11	14:25:14	15:20:09	16:12:37	17:11:01	18:07:19
7:01:52	8:32:31	9:47:02	10:33:59	11:21:04	12:08:13	12:54:49	13:48:33	15:02:04	16:38:53	17:25:32	18:28:55
8:33:35	9:28:55	10:36:58	11:34:20	12:35:54	13:32:47	14:27:34	15:29:04	16:24:42	17:19:57	18:13:09	19:06:00
8:52:56	10:06:13	11:17:48	12:19:01	13:18:31	14:19:19	15:19:39	16:19:42	17:18:20	18:21:02	19:20:23	20:18:05
9:26:31	10:29:46	11:36:08	12:47:54	13:45:41	15:02:46	16:00:25	17:06:45	18:07:48	19:04:04	20:01:15	20:57:06
9:30:10		10:42:32	11:30:30	12:56:36	14:52:53	15:44:42	16:32:51	17:20:00	18:24:07	Broke frame	
9:17:34	10:28:36	11:47:04	12:47:00	13:47:44	14:52:22	15:54:58	17:50:15	19:11:00	Running when race called off		
7:32:32	8:12:47	9:18:37	10:07:53	10:56:48	11:45:27	12:34:11	13:29:11	Overturned on bend			
6:33:28	7:16:42	8:20:09	9:41:37	10:38:14	11:36:03	12:39:47	Broken piston				
7:28:57	8:17:51	9:08:36	9:56:42	10:44:27	11:39:22	12:31:31	13:20:30	14:07:53	Lost front wheel		
7:20:32	8:09:09	9:27:51	10:16:33	11:07:50	12:04:42	12:53:29	14:13:46	Valve trouble			
8:16:25	8:57:58	Disqualified for taking gas									
6:41:43	9:16:24	Abandoned									
7:02:15	7:47:43	Withdrawn									
7:24:13	8:12:47	Withdrawn									
7:22:31	8:27:07										
8:35:50	9:50:30	Broke rocker arms									
Lost oil out of motor											
Broke valve											
Broke connecting rod and road wheel											
Valve trouble											
Fouled plugs											
Cracked water pipe											
Broke ball-bearing camshaft											
Broken steering gear											
Connecting rod broke											
Skidded, hit tree											
Burst gear box											
Lost oil out of motor											
Universal joint broke											
Broke wrist pin											
Went into ditch; mechanic killed											
Bearings ran dry											

DE PALMA TAKES TURN; WAGNER CATCHING VINOT ; ARROL ON A TURN

tered is too large, taking into account the length of the course, the A. C. A. contest board may hold elimination trials. All cars participating in the race must submit to a preliminary examination by the A. C. A. technical committee and hold a certificate from the committee before being permitted to start. The requirements in regard to mechanical construction are simply that the over-all width of a competing car must not exceed 6 feet 2 inches; it must have a reverse gear-driven by the motor, and an exhaust that is not directed toward the ground. Every agent of oxidation other than atmospheric air is forbidden. The entry fee is $1,000 for one car; $1,500 for two cars, and $1,750 for three cars of the same make. The prizes are: 1st, $5,000; 2d, $2,500; 3d, $1,250; 4th, $750; 5th, $500.

The brightest luminaries in the galaxy of stars which competed at Tacoma on July 6—to-wit, Tetzlaff, Mulford, Bergdoll and Bragg—stopped in Milwaukee on the way to the coast and looked over the ground. They seemed impressed with the course and the progress already made upon the improvement of the roads, and all promised to be on deck in September.

A publicity campaign of international scope has been started by the M. A. D. A. The United States has been divided into three sections for practical purposes—the eastern, with New York as headquarters; the western, with Denver as headquarters, and the central, which will be served by the executive offices of the race committee of the M. A. D. A., assisted by a bureau in Chicago. Gigantic lithographs are now being prepared and every barn in any crossroad in the country will bear one or more of the gaudy show pieces. The M. A. D. A. is sending a special car through the third annual Wisconsin reliability next week to distribute posters, announcements, handbills and other literature advertising the cup races.

There was considerable joy in the Milwaukee camp when announcement was made that the Elgin events had been

BOILLOT STOPS AT PIT FOR TIRES

MEDINGER IN SUNBEAM TAKES ON FUEL

called off and that Carl Fisher would not run a meet on his speedway on Labor day. With all of the principal scheduled events out of the way, the Milwaukee races ought to attract the largest field ever entered in any speed carnival, for there will not be the slightest competition.

The road work is progressing satisfactorily and the course already shows much improvement. The placing of the start and finish line will not be done until the various straightaways are in a completed condition. It is believed, however, that the Beloit road straightaway will be used for this purpose. Clearings are now being made at several spots proposed for the grandstands, bleachers and official and press stands, as well as the pits.

MANY ENTER BADGER TOUR

Milwaukee, Wis., July 9—Entries for the third annual Wisconsin reliability tour for the Sentinel and Emil Schandein trophies will close at midnight, tomorrow, Wednesday, July 10, and present indications are that no fewer than fifty cars will start the Badger Glidden, which begins Monday, July 15, and ends Friday, July 19.

The extremely liberal rules under which all classes of the 1912 tour will be run, namely grade 3 of the A. A. A., with additional time allowances and a slow running schedule, have brought many new dealers and a large number of private owners into the contest this year. It is hardly expected that either the Sentinel cup, for the trade classes, or the Schandein trophy, for private owners, will go to any one car, as perfect scores should be the rule rather than the exception under the conditions governing the tour.

The itinerary of the run is as follows: July 15, Milwaukee to Beloit, 112.9 miles. July 16, Beloit to Baraboo, 133.2 miles. July 17, Baraboo to Oshkosh, 134.5 miles. July 18, Oshkosh to Green Bay, 109.3 miles. July 19, Green Bay to Milwaukee, 129.1 miles. The total mileage is 619.0 miles, as compared with 1,000 miles in 1911.

WAGNER PASSING THROUGH TOWN ROAD SCENE BOILLOT BEATING IT

RIGAL, WINNER OF SMALL-CAR RACE, STOPS AT PIT

AMBULANCE SERVICE MAINTAINED ON GRAND PRIX COURSE

Old Orchard Beach Records Smashed

Disbrow Star Performer in 3-day Meet with His Jay-Eye-See and Simplex Zip—Nikrent, Matson and Grant Among Other Crack Drivers Contesting in Speed Carnival

OLD ORCHARD BEACH, ME., July 6—Once more Old Orchard has had a motor meet, and once more the famous beach has made good as a race course. On July 4, 5 and 6 some of the best drivers of the country appeared here and many new marks were set up for the course.

Louis Disbrow in Jay-Eye-See, Harry Grant, Joe Nikrent, Jack Rutherford, Jack Le Cain, Joe Matson and other noted drivers were all on hand.

While at the races last September there were some marks set up for the Old Orchard beach course that were questioned, most of those were beaten at the meet just concluded today. Disbrow set out to establish a beach record in his Jay-Eye-See. He did it. On Thursday, July 4, he took a long, flying start and covered the mile in 35.1 seconds. Last year L. F. Baldwin in his big Stanley steamer did the distance in 39 seconds flat.

Today, the last of the meet, Disbrow in the Simplex Zip covered 5 miles in exhibition in 4:04:50 and did the 10 miles in 8:53. These are not as good as the marks given for last fall's races, but as the course in 1911 was questioned, it is thought the new figures set by Disbrow will be taken as the standard for the beach.

On Friday W. Endicott in his Schacht did the 100 miles in 1:36:41, which bettered the time of 1:39:50 made the year before. But even this mark did not stand long, for today Dave Lewis in a Stutz covered the distance in 1:32:43.60.

Perhaps the most thrilling event of the 3 days was the 100-mile race on Friday. Jack Rutherford, winner of the century the year before, was out to repeat the performance. On Thursday he burned out a clutch, but his machine was in fine fettle for this event on Friday, or at least seemed to be.

For 99 miles he held the lead as the cars raced around the course and several were left by the wayside. As he entered his one-hundredth mile the oil supply failed and Bill Endicott, who had been running second, passed the National and won out. It developed that the oil tank had begun to work loose in the fortieth mile. Rutherford kept on, however, occasionally easing up his car. The continual jar had its effect and at last the oil gave out altogether. He burned out a bearing at the finish, but still was able to cross the line 9 seconds behind Endicott. Summaries:

FIRST DAY

ONE-MILE TIME TRIALS, FLYING START

Car	Driver	Time
Jay-Eye-See	Louis Disbrow	35 :10
National	John Rutherford	47 :00
National	Neil Whalen	47 :50
Chadwick	L. C. Hersey	55 :10
Berkshire	Harry Grant	58 :00

CLASS C, NON-STOCK, 161 TO 230 CUBIC INCHES, 5 MILES

E-M-F	Billy Burke	No time taken

CLASS C, NON-STOCK, 231 TO 300 CUBIC INCHES, 10 MILES

Case	Joe Nikrent	10 :28.75
Mercer	John De Palma	10 :30.75
Lexington	James Esleeck	No time taken
Case	Louis Disbrow	Did not finish

CLASS C, NON-STOCK, 301 TO 405 CUBIC INCHES, 5 MILES

National	John Rutherford	4 :25.80
Stutz	Dave Lewis	4 :42.10
Schacht	Bill Endicott	4 :42.10
National	Neil Whalen	4 :46.50
Berkshire	Harry Grant	No time taken

CLASS E, NON-STOCK, UNDER 600 CUBIC INCHES, 10 MILES

Simplex Zip	Louis Disbrow	8 :36.75
Fiat	Joe Matson	8 :50.10
Stutz	Dave Lewis	9 :00.00
Bianchi	Charles Basle	10 :10.14
National	Neil Whalen	Withdrawn
National	John Rutherford	Withdrawn

CLASS E, NON-STOCK, SPECIAL EVENT, THREE RACES RUNNING SIMULTANEOUSLY; 100 MILES. RACE A, 301 TO 450 CUBIC INCHES; RACE B, 451 TO 600 CUBIC INCHES; RACE C, OVER 600 CUBIC INCHES. RACE STOPPED AT END OF 75TH MILE

Stutz	Jack LeCain, 75 miles	1 :17.48.75
Berkshire	Harry Grant, 75 miles	1 :21.06.00
National	Neil Whalen, 65 miles	1 :21.12.00
National	John Rutherford	Did not finish
Schacht	Bill Endicott	Did not finish
Fiat	Joe Matson	Did not finish
Fiat	Robert Stuart	Did not finish
Bianchi	Charles Basle	Did not finish
Chadwick	L. C. Hersey	Did not finish

SECOND DAY

CLASS E, HANDICAP, NON-STOCK, UNDER 301 CUBIC INCHES, 10 MILES

E-M-F	Billy Burke, 22 seconds	5 :49.50
Mercer	John de Palma, scratch	5 :57.10
S. O. P.	Howard Plimpton, 36 seconds	6 :16.50

CLASS D, NON-STOCK, FREE-FOR-ALL, 5 MILES

Simplex Zip	Louis Disbrow	4 :39.10
Stutz	Dave Lewis	4 :40.00
Fiat	Joe Matson	4 :42.00
National	Neil Whalen	4 :50.00
Chadwick	L. C. Hersey	No time taken
National	John Rutherford	Withdrawn

CLASS E, NON-STOCK, UNDER 301 CUBIC INCHES, 50 MILES

Mercer	Alfred Hummel	54 :10.50
Case	Joe Nikrent	55 :45.00
S. O. P.	Howard Plimpton	1 :07 :10.75
Case	Louis Disbrow	Did not finish

CLASS C, NON-STOCK, 301 TO 450 CUBIC INCHES, 5 MILES

National	John Rutherford	4 :32.30
Stutz	Dave Lewis	4 :43.10
National	Neil Whalen	4 :47.10
Schacht	Bill Endicott	5 :02.50
Berkshire	Harry Grant	Did not finish

CLASS E, NON-STOCK, 301 AND OVER CUBIC INCHES, 100 MILES

Schacht	Bill Endicott	1 :36.41.00
National	John Rutherford	1 :36.50.10
National	Neil Whalen	1 :40.05.10
Berkshire	Harry Grant	Did not finish
Chadwick	L. C. Hersey	Did not finish
Stutz	Jack LeCain	Withdrawn
Jackson	Harry Cobe	Did not finish

SPECIAL EVENT FOR MILE RECORD

Jay-Eye-See	Louis Disbrow	:39.10

THIRD DAY

CLASS C, NON-STOCK, 231 TO 300 CUBIC INCHES, 10 MILES

Case	Joe Nikrent	9 :54.00
Mercer	John de Palma	9 :59.90
Lexington	James Esleek	12 :13.00
Case	Louis Disbrow	Did not finish

FIVE MILES AGAINST TIME, FLYING START

Simplex Zip	Louis Disbrow	4 :04.50

CLASS E, NON-STOCK, 231 TO 300 CUBIC INCHES, TWO RACES SIMULTANEOUSLY, 25 MILES

CLASS 2-C, 161 TO 230 CUBIC INCHES

E.M-F	Billy Burke	27 :10.80

CLASS 3-C, 231 TO 300 CUBIC INCHES

Case	Joe Nikrent	25 :29.10
Mercer	Alfred Hummel	25 :37.10
Lexington	James Esleeck	27 :10.80

CLASS D, NON-STOCK, FREE-FOR-ALL, 10 MILES

Simplex Zip	Louis Disbrow	8 :53.00
National	Neil Whalen	9 :40.10
Mercer	John de Palma	10 :22.00

ONE MILE, FLYING START, FOR BEACH RECORD

Jay-Eye-See	Louis Disbrow	:36.50

CLASS E, NON-STOCK, THREE RACES RUN SIMULTANEOUSLY, 100 MILES; RACE A, 301 TO 450 CUBIC INCHES; RACE B, 451 TO 699 CUBIC INCHES; CLASS C, OVER 600 CUBIC INCHES

Stutz	Dave Lewis, race A	1 :32.43.60
Schacht	Bill Endicott, race A	1 :36.09.00
Jackson	Harry Cobe, race A	1 :50.11.50
Berkshire	Harry Grant, race A	*1 :54.30.00
National	Neil Whalen, race A	Did not finish
Fiat	Joe Matson, race C	Did not finish
Bianchi	Charles Basle, race B	Did not finish

*Went 90 miles

RUTHERFORD IN NATIONAL, MATSON, FIAT AND GRANT, BERKSHIRE, AT OLD ORCHARD

Wildwood Scene of Motor Carnival

Quakers Participate in Roadability Run to New Jersey Summer Resort—Series of Straightaway Mile Races Held on Fourth of July, Fiat Gaining Speed Honors

WILDWOOD-BY-THE-SEA, N. J., July 4—Ralph D. Earle, of Philadelphia, driving an American car, captured first prize yesterday in the roadability run from Camden to this resort, held under the auspices of the combined boards of trade of Wildwood, North Wildwood and Wildwood Crest. Earle's time was 6 hours 22 minutes 40 seconds for the 108 miles, which was within 35 seconds of the secret time set by Mayor J. Thompson Baker, of Wildwood—6 hours 23 minutes 15 seconds. The prize was $50 in gold. Second prize, the Hotel Ridgway cup, was won by F. P. Kesley, Case car, who finished 1 minute 13 seconds out of the way, his time being 6 hours 22 minutes 2 seconds. M. R. Faulkner, Michigan car, captured third prize, the Colonial hotel cup, Wildwood, in 6 hours 24 minutes 29 seconds, 1 minute 14 seconds slower than the secret schedule, and fourth prize, the Hutchinson Motor Co. cup, Woodbury, was carried away by a woman driver, Mrs. C. V. R. Caldwell, in a Premier; time, 6 hours 20 minutes 30 seconds.

In addition to the main prize awarded for the full distance there were running premiums for the cars finishing nearest the schedule set for the intermediate controls, of which there were four. The Alloway hotel cup, Alloway, N. J., offered as first control prize, was captured by N. A. Koch, driving an Inter-State, who checked in 51 seconds ahead of the scheduled time. Car No. 35, a Case, driven by Henry Fallows, won second prize, the Nelson house cup, Salem, N. J., he arriving within 1 minute 18 seconds of the allotted time. Third prize, the Bridgeton cup, went to the winner of the first control, N. A. Koch, Inter-State, 2 seconds slow. The Ruric hotel cup, fourth prize, was won by William Eldridge, Garford car.

In the special division for women drivers, of whom about half a dozen competed, two prizes were hung up. First prize was captured by the winner of fourth prize in the main division, Mrs. C. V. R. Caldwell, time 24 minutes slower than the schedule; the second by Miss Anna E. Verga, KisselKar, 34 minutes 50 seconds slow. Mrs. Sarah Hoffman, Ford car, was third, 50 minutes 47 seconds slow.

The special prize of $50 for the Philadelphia dealer having the greatest number of cars of any one make entered in the run was won by the Case, with ten cars in line. Of the total list of eighty-four entries sixty-three cars left the new Hotel Ridgway, Camden, between 9 and 11 o'clock.

Leaving the Hotel Ridgway, Camden, the route mapped out for the tourists was a circuitous one and for part of the way out of the beaten path. The first stopping place was Woodbury, where all were required to lay over for 10 minutes. From Woodbury the route was through Berkeley, Clarksboro, Mickleton and Swedesboro. At the latter town was another enforced stop of 10 minutes. Then through Woodstown to Alloway a 10-minute-stop; Salem, 10-minute stop; Quinton, Shiloh to Bridgeton, the half-way point, where a stop of 30 minutes for luncheon was made. Upon resuming the run the participants' road lay through Millville to Port Elizabeth, 10-minute stop, Dorchester, Leesbing, Delmont, Dennisville, Cape May Court House, 10-minute enforced stop; Rio Grande, over the Wildwood boulevard into Wildwood.

The success of yesterday's roadability run to this resort was second only to that which attended the speed trials held today on the 1-mile straightaway course, which brought the 2-day motor carnival to a close.

Speed honors of the day were divided between William Frietag in the Fiat, who in the trials for the 1-mile record, flying start, negotiated the distance in 43⅗ seconds, and John Menker, who made the fastest mile of the day in a race, :55, in event No. 3. Menker drove a Klinekar. The record established 2 years ago by the Chadwick car remains unbroken, however, as at that time a mark of :41 was hung up.

Eddie Bauer, driving a Buick, proved the most consistent winner of the meet, capturing first place in the opening event, the first heat and the race in the final time trials. In the first race Bauer was given a close rub by H. Baker, driving a Cartercar, the latter being only a car's length behind at the finish.

Harvey Ringler had a walkover in the second event, winning from C. C. Fairman, Klinekar, by the wide margin of 21 seconds. John Menker, Klinekar, let out a link in the third race and made the fastest mile of the day outside of the record trials. Menker finished in :55.

Preceding the races this morning was a happy-go-lucky run for women conducted by Mrs. D. Walter Harper. All cars were driven by women over a specially marked route through Wildwood and Wildwood Crest, with women passengers and officiated over by women.

Over at Cape May today thirty-two pleasure cars and seven commercial vehicles, all decorated, paraded through the resort, prizes being awarded for the best decorated cars. Summaries of the races on the straightaway:

Event No. 1, division 2-C, non-stock, piston displacement 161 to 230 cubic inches, 1 mile—Eddie Bauer, Buick, won; time 1:15⅗. H. Baker, Cartercar, second; time 1:16⅖. R. S. Smith, Jr., Empire, third; time 1:19⅘.

Event No. 2, division 3-C, non-stock, piston displacement 231 to 300 cubic inches, 1 mile—Harvey Ringler, Mercer, won; time 1:08. C. C. Fairman, Klinekar, second; time 1:29.

Event No. 3, division 4-C, non-stock, piston displacement 301 to 450 cubic inches, 1 mile—John Menker, Klinekar, won; time :55. P. C. Knox, Jr., National, second; time 1:04⅗. W. C. Thiebaud, G. J. G., third; time 1:08.

Event No. 4, time trials, 1 mile, open to all cars—William Frietag, Fiat, :43⅗; J. Menker, Klinekar, :46⅗; C. F. Stretch, Chadwick, :50; George Davis, Apperson, :53⅘; P. C. Knox, Jr., National, :56⅕; S. Wood, Benz, 1:00⅗; E. G. Harris, Marion, 1:04⅘.

Event No. 5, final time trials, first heat—Eddie Bauer, Buick, 1:19; P. Baker, Cartercar, 1:19⅘; R. S. Smith, Empire, 1:21⅗.

Second heat—Harvey Ringler, Mercer, 1:06⅗; E. G. Harris, Marion, 1:12⅕; C. F. Stretch, Chadwick, 1:19⅕.

Third heat—George Davis, Apperson, 1:06⅕; William Frietag, Fiat, 1:06⅘.

Final heat—Eddie Bauer, Buick, 1:15; George Davis, Apperson, 1:15⅘; Harvey Ringler, Mercer, 1:16⅘.

Event No. 6, special event—Won by E. G. Harris, Marion; time 1:08. Ralph D. Earle, American, second; time 1:17.

RACING AT OLD ORCHARD—NIKRENT IN CASE WINNING FROM J. DE PALMA IN MERCER.

Detroit Would Change Glidden Date

Motorists in City from Which National Tour Will Start do Not Want October 3 Original Selection—Desire Get-away Shortly After Close of Michigan State Fair

NEW YORK, July 9—Advices have been received at the offices of the American Automobile Association touring bureau from the national tour start committee at Detroit, Mich., of which Robert K. Davis is president and F. Ed Spooner is secretary, that the time of the start is inimical to that city, which had originally scheduled October 3 in the belief that President Taft and Speaker Clark would be there for the national good roads congress and would then start the event. The Detroiters have asked now that the date be set at any time after the close of the state fair held in that city and which closes on September 21.

No definite information has as yet been given regarding the definite route, Detroit, Memphis and New Orleans being the only three cities named. By what routes these three will be connected is not known and will not be until the pathfinder has made its trip. Much of the district to be traversed must be explored in a painstaking way in order that the route selected may not be a duplicate of that route to Dallas, Tex., which proved so disastrous. The Detroiters are anxious to make Indianapolis a Sunday stop if possible on the 1,500-mile journey and it is not improbable that the route will be laid that way. The pathfinding trip is scheduled to start about July 23, which will be the second day of the great Cadillaqua celebration in Detroit, when thousands upon thousands of motoring visitors will be in the city for the ceremonies and to give the pathfinder a fitting sendoff.

Reports from Detroit are to the effect that the motor car manufacturers there are taking the liveliest interest in the great classic and that many cars will be entered from the Wolverine state to compete for the Glidden, Anderson and American Automobile Association trophies. Where few of the makers entered teams last year, the record-breaking entry list being made up for the most part in private entries, there is every indication not only in Michigan, but also in Indiana and Ohio, according to a traveling representative who interviewed the makers, that the makers will be generously represented this season.

The special committee in charge of the tour for the A. A. A. includes Colonel Frank M. Joyce, of Minneapolis; Lewis R. Speare, of Boston; William E. Metzger, of Detroit; John A. Wilson, Franklin, Pa., and W. E. Moyer, Des Moines, Iowa.

A number of makers having applied for the privilege of doing the pathfinding for the great event, the special committee will meet at the A. A. A. offices in New York next Tuesday to determine upon the car and the pathfinding trip will start within 1 week from that date.

FOUR-STATE TOUR STARTED

Indianapolis, Ind., July 9—Thirty-three cars, representing seventeen Hoosier factories, got away at 1-minute intervals beginning at 6:30 o'clock this morning in the second annual Indiana four-states tour. The tour is non-competitive, its principal purpose being to advertise motor cars made in Indiana.

The Hoosier Motor Club last night gave a farewell smoker in its club rooms for the participants in the tour. There was a Dutch lunch in connection with the smoker and speeches were made by Charles A. Bookwalter, president of the club, Fred I. Willis, chairman of the runs and tours committee of the club; Clarence A. Kenyon, good roads expert; Frank L. Moore, of the Fisher Automobile Co., and W. S. Gilbreath, president of the club.

The tour is under the auspices of the Indiana Automobile Manufacturers' Association and lies through Indiana, Ohio, Kentucky and West Virginia. It will continue 16 days and the route is approximately 1,240 miles in length. Tons of advertising matter is being carried. The first night control is at Fort Wayne. Following is the list of cars and those who are making the tour:

American Motors Co., Indianapolis, three cars, D. S. Menasco, E. C. Updyke, M. O'Leary, Ralph Reade, C. E. Hayden and H. G. Fletcher; Service Motor Truck Co., Wabash, L. G. Fox and George Corder; Great Western Automobile Co., Peru, two cars, Clarence Lamar and M. G. Beckner; Motor Car Mfg. Co., Indianapolis, two Pathfinders, G. P. Simons, W. K. Bromley, Henry Kinppenberg, Bruce Daniels, Charles Scholler and H. G. Copeland; Marion Motor Car Co., Indianapolis, two cars, W. W. McClure, Hugh Dane, Ray Leeman; Nyberg Motor Works, Anderson, four cars, C. E. Henderson, Jack Ewing, Dr. E. W. Seawright, Joseph Hennings, Perry Cozatt and Buster Kiger; Premier Motor Mfg. Co., Indianapolis, two cars, Walter Weidley, H. M. Love, John Orman, Dr. Lyon, Henry Leutzinger and William M. Herschell; Nordyke & Marmon Co., Indianapolis, two cars, George Treadgold, Ralph Elvin, A. B. Wagner and F. E. Hoop; McFarlan Motor Car Co., Connersville, two cars, Emory Houston, Leo Kahn, Ned Cotton, W. B. Adams, Earl Walker, H. M. McFarlan, H. M. McFarlan and John Myers; Double Fabric Tire Co., Auburn car, B. A. Beidler, Will Willenar, Earl Parker and George A. Bishop; Cole Motor Car Co., Indianapolis, Lou Pettijohn, Fred Wellman; Whitesides Motor Truck Co., Franklin truck, V. F. Whitesides, J. C. Cockran, Thomas Wright, Dick Barnnigan, Al Moody, Jack Kennedy and James Wallope; De Tamble Motors Co., Anderson, two cars, C. H. Walters, M. L. Alfont, A. W. Patty and J. W. Sandberry; Haynes Automobile Co., Kokomo, two cars, Elwood Haynes, C. L. Williams, T. H. Burke and A. I. Tish; Maxwell-Briscoe Motor Co., Newcastle, four cars, Howard Van Matre, Lawrence Bailey, W. McK. White, Henry D. Pierce, Milford Weisle and Kenneth Highley.

The Lexington Motor Car Co., Connersville, had one car and the Premier Motor Mfg. Co. was also represented by its prairie schooner, which will serve as an ambulance in case one is needed.

AUSTRIANS HOLD ALPINE TOUR

Vienna, Austria, June 26—Under the auspices of the Vienna Automobile Club and the patronage of Archduke Leopold Salvator, a tour of the Alps was completed on June 23. It is probable that the route followed is one of the most trying to be found in Europe. Thirty-one makes were entered in the tour, numbering ninety-four cars, eighty-four of which started. The itinerary was strenuous, and the distances traveled, considering the grades that had to be negotiated, were surprising. One thousand four hundred and forty miles of this arduous climbing was accomplished in 7 days all told, only 6 days being consumed in the actual travel.

The start was made from Vienna at 5 a. m., Sunday morning, June 16. Crossing Semmering pass and passing through Leisen, 243 kilometers, the cars encountered the first climbing between Leisen and Radstadt, 312 kilometers, when the Schroeber and Mandling passes were crossed. From there on the going became more difficult every kilometer traveled. The steepest grades were encountered after leaving Radstadt, on the Tauern pass, where the cars were subjected to 11 kilometers of precipitous ascent, on a narrow but well-made road. From the summit of the pass a steep descent led into St. Michael-im-Lungau, where the ascent of the Katchberg mountains commences. This passage was even more strenuous than the one just compassed, the grade being at times as much as 22 per cent. At this stage the Rolls-Royce car, the only English entrant, was disqualified for unloading its passengers. The descent was found to be perilous, as the grade was steep and the road surface in bad condition. The first day's run was concluded at Spittal-a-der-Drau, 404 kilometers, four cars having been scratched the first day.

The second day's run was through Lienz, through the famous Dolomitenstrasse, through Toblach and Puster Valley. From thence the way led through Meron to Bozen, where a short cut was made through the Mendel pass, avoiding the valley route to Trient. At Franzenfeste the first mountainous going was encountered on the second day's run, when the Brenner was entered, being followed to Sterzing. From Sterzing a new road was traversed for the first time by the tourists. This road leads through the Jauffen pass to St. Leonard. It is a splendid example of highway engineering and rises to over 6,000 feet through superb scenery.

During this passage a collision occurred between an Austro-Daimler and a Lauren-Klement. Later in the day another collision occurred between two non-contesting cars, a Daimler and a Zust, which delayed the contestants for some time. The second day's run was concluded at Trieat, 402 kilometers having been traveled.

The third day the way led over the Broccone, 5,305 feet, the Gobera, and the Rolle, 7,382 feet, through Predazzo and Cortina, over the Pordoi pass and the Falzarego, 6,913 feet, to Trieste, 327 kilometers. During this day's run a Mors was burned up in the Broccone and C. Alfred Fischer's car, a Mercedes, after running on a broken spring for some time, pitched over a cliff and killed its owner and his wife and seriously injured the official observer, the chauffeur escaping uninjured. At Trieste a day's rest was taken, the journey being resumed on Friday morning. Friday's journey led through Pisino, which was the most southerly point reached, the northward return being concluded for the day at Laibach, 297 kilometers from Trieste. Saturday's run was through Graz, 256 kilometers, to Vienna, the end of the tour, 372 kilometers from Laibade.

PROMOTION FOR W. H. RADFORD

Detroit, Mich., July 8—W. H. Radford has been promoted to the position of factory manager of the Warren Motor Car Co. His former position as designing engineer and chief of the engineering department has been taken by W. H. Knowles. Mr. Radford, however, will continue in the capacity of consulting engineer. He is perhaps one of the youngest factory managers in the industry, being just 31 years of age. First he was one of the engineers of the Olds Motor Works at Lansing, Mich. On leaving the Olds company he became assistant engineer of the Hudson Motor Car Co., where he remained until the formation of the Warren concern.

NORTHWEST'S CROP REPORTS

Minneapolis, Minn., July 8—Crop reports from all the northwest continue to be optimistic. Nature seems to have joined hands with the scientific farmer to produce an enormous crop of all kinds in the northwestern states. The cold and backward spring drove the roots deep, and then needed rains stored the soil before the moisture from the heavy snows had left the grounds. When a dry spell followed, which threatened to burn the crop in some sections, it has rained again. Business men generally and bankers who pay special attention to crop reports are practically one in seeing a good future as well as present satisfactory trade.

Pope-Hartford Sweeps Davenport Hill

Eight Events Contested on National Holliday—Cadillac Does Well—Row Starts Because Track Meet Conflicts With Motor Boat Regatta and Protest Will be Sent A.A.A.

DAVENPORT, Ia., July 6—The annual hill-climb of the Davenport Automobile Club took place Thursday morning, being witnessed by several thousand spectators, although started at 7 o'clock in order not to conflict with the races of the Mississippi Valley Power Boat Association. There were eight events. The Pope-Hartford carried off the honors of the day, winning four firsts, a second, third and establishing the best time of the day for the steep climb of four blocks, 18 seconds flat. The Cadillac made the next best record with three firsts and a second. Of the forty-one entries there were twenty-three which faced the starter's gun. Summaries:

$1,000 AND UNDER.

Car	Driver	Time
Overland	Knowles	:24
Overland	Holbrook	:36⅘

$1,000 TO $1,500.

Maxwell	Derrough	:24

$1,500 TO $2,500.

Cadillac	Johnson	:21

$2,500 AND OVER.

Pope-Hartford	Petersen	:18⅘
Pierce-Arrow	Burmeister	:28⅘

$2,000 AND OVER, CARRYING FOUR PASSENGERS.

Pope-Hartford	Petersen	:24⅘
Pope-Hartford	Lambach	:25⅘
Pope-Hartford	Arnould	:27
Pope-Hartford	Crook	:28
Pope-Hartford	Steffen	:28⅘

$2,000 AND UNDER, CARRYING FOUR PASSENGERS.

Cadillac	Priester	:27⅘

HANDICAP, AGE OF CAR, NUMBER OF MILES TRAVELED AND ORIGINAL COST CONSIDERED.

Pope-Hartford	Lambach, :04 hdcp	:21
Cadillac	Johnson	:21⅘
Pierce-Arrow	Burmeister	:22⅘
Overland	Boggs	:23⅘
Pope-Hartford	Arnould	:25
Cadillac	Burmeister	:26⅘
Pope-Hartford	Crook	:28
Pierce-Arrow	Lane	:43⅘

FREE-FOR-ALL.

Pope-Hartford	Petersen	:18
Cadillac	Johnson	:22
Maxwell	Derrough	:24⅘

Owing to the attitude of the local newspapers, which refused to publish advertisements for the races at the mile track the afternoon of the Fourth, in which Bob Burman, Luis Meneghetti, Elmer McDonald, Johnny Raimey and Will Bishop participated, there were but 2,000 in attendance. The Commercial Club was responsible for the attitude of the dailies, as the booster organization was managing the Mississippi Valley Power Boat Association regatta and considered the motor car races a rival attraction. The best time was made when Burman covered a mile in :52⅘, driving a Blitzen Benz. Prominent members of the Commercial Club held an indignation meeting, condemning the action of the A. A. A. sanctioning the local races without investigating local conditions.

It is felt that there should have been an investigation of local conditions before the sanction was issued.

SEATTLE TALKS ROADS

Seattle, Wash., July 6—A representative committee of Seattle motorists gathered July 2 at a luncheon in honor of A. G. Batchelder, chairman of the executive committee of the A. A' A. In the company were Judge J. T. Ronald, president of the Pacific Highway Association; Judge Richard A. Ballinger; Judge Alfred Battle; C. E. Plimpton, president of the Automobile Club of Seattle; Joseph Blethen, W. A. Avery, Frank M. Fretwell, R. P. Rice and George Bentel of San Francisco. Judge Ronald was emphatic for the organization of a state motoring body, which should affiliate with the A. A. A. and co operate in the good roads movement and kindred progressive measures. This will doubtless come eventually and will practically be a replica of the work already carried forward by the Seattle club, only in a more comprehensive field.

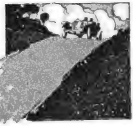
The Seattle club is one of the livest in the country, and has done more actual work in good roads movements than most of the population ever will know or recognize. Money, time and enthusiasm have alike gone into the good cause and with excellent results.

The plan advanced by Mr. Batchelder for taxation by horsepower and providing that the money be used on the roads already has been discussed in Seattle several times, and has not met with universal approval. It has decided merit, however, and should not be dismissed without careful appraisal.

RECENT ABBOTT APPOINTMENTS

Detroit, Mich., July 8—The Abbott Detroit sales forces have been strengthened by the addition of four district managers. E. D. Hand, just resigned as assistant sales manager of the E. R. Thomas Motor Co., has been given the states of Ohio, Pennsylvania and West Virginia; S. T. Henderson, who formerly was with the Bergdoll company, has been given the management of the sales for a number of southern states with headquarters at Atlanta, Ga.; F. E. Westcott, formerly representative of the Reo company, assumes the control of the Indiana and Kentucky output; and J. E. Warren, who has been connected with the Chalmers company for the past 4 years, takes charge of the Pacific coast sales as special representative.

Routes and Touring Information



TIMBER GROVE SCENE AT THE WEEK END'S CAMP NEAR SHENANDOAH, IA.

ROUTE THROUGH TEXAS

SAINT FRANCIS, Tex.—Editor Motor Age—Please give me the best route from Amarillo to Brownsville, Tex., by the way of Rule, Corsicana, Austin and San Antonio.—W. C. Wright.

From Amarillo to Rule you have an option of two roads and there are drawbacks to either. The one to Plainview, Lubbock, etc., takes you through the extensive prairies over cattle trails and sometimes not even that to guide you, while by way of Wichita Falls and then south to Rule you encounter a 90-mile stretch of very poor sandy road between Lelia Lake and Acme.

The former road lies through Canyon, Happy, Tulia, Plainview, Hale Center, Abernathy, Lubbock, Slaton, Post, Snyder, Roscoe, Sweetwater, Abilene, Ensan, Stamford, Haskell and Rule. By way of Wichita Falls the towns are Clarendon, Lelia Lake, Rowe, Memphis, Newland, Estelline, Carey, Childress, Kirkland, Goodlet, Acme, Quanah, Danish, Chillicothe, Tolbert, Vernon, Oklaunion, Harold, Electra, Iowa Park, Wichita Falls, Seymour, Haskell and Rule. The best you can do is inquire from town to town, as there are no books published covering this section with running directions.

After leaving Rule go to Haskell and route south to Stamford, Anson, Truby, Hodges, Abilene, Hamby, Albany, Breckenridge, Palo Pinto, Mineral Wells, Weatherford, Annetta, Aledo, Ben Brook, Fort Worth. You can go direct to Corsicana through Kennedale, Mansfield, Midlothian, Waxahachie and Ennis or to Arlington, Grand Prairie and Dallas, then to Waxahachie. For San Antonio pass through Mexia, Groesbeck, Martin, Waco, Lorena, Bruceville, Eddy, Troy, Temple, Little River, Sparks, Holland, Bartlett, Granger, Jonah, Georgetown, Round Rock, Fiskville, Austin, Buda, San Marcos, Goodwin, New Braunfels, Selma, San Antonio.

Between San Antonio and Brownsville the following towns are touched: Floresville, Poth, Karnes City, Kennedy, Pettus, Normanna, Beeville, Skidmore, Alice, Kingsville, Raymondsville, Edinberg, McAllen, Pharr, San Juan, Donna, Mercedes and the military road into Brownsville.

Most probably you will have to ship your car from Kingsville to Raymondsville, a distance of 70 miles, on account of the shifting sand hills.

TRY OUT CAMPING OUTFIT

Shenandoah, Ia.—Editor Motor Age:—We are getting ready for a camping trip to the Colorado mountains, and just took a trial trip for the purpose of finding out how the outfit would pack in the car and how it would work. We went out to a nearby grove of timber about 8 miles from Shenandoah and camped over Saturday and Sunday, living in every way just as we would in the mountains. It was like the trial trip of a new ship to prove that everything was in good working order.

One of the pictures shows the folding cot, table, chair, cooking kit and firejack. We have a two-room tent, 9 by 14, made of special lightweight, tight-woven canvas. It is made with a rope ridge, doing away with the long ridge pole and with jointed steel rods for upright poles. The cooking outfit is one which nests and packs inside the firejack. This and the table, chair, cot, blankets and children all pack in together in the tonneau of the big car, with the suitcases on the running board and my wife and I on the front seat. The tent rolls up, slips in a sack and is carried on the other running board.—Henry Field.

STATE REGISTRATIONS

Rushville, Ind.—Editor Motor Age—I am contemplating a trip through Ohio, West Virginia, Pennsylvania, Maryland, New Jersey, New York, Connecticut and Massachusetts, and desire to know if any of these states require a license from an Indiana licensed car, and if so, what are the regulations governing these states?—A. B. Irvin.

In Connecticut and Massachusetts you are restricted to 10 days, in New Jersey you are permitted 15 days in one year while non-residents in Maryland have to apply to the commissioner of motor vehicles for a 7-day permit tag, two of which can be had each year, no charge being made. In the other states mentioned you are exempt.

CALIFORNIA TO COLORADO

Oilfields, Cal.—Editor Motor Age—Please outline a route from Bakersfield, Cal., to Pueblo, Colo.—W. A. Veward.

Eliminating the southern transcontinental route to Los Angeles, Phoenix, Ariz., Albuquerque and Santa Fe, N. M., and north to Pueblo on account of the terrific heat crossing the desert land in Arizona; also the cut off to Independence, Goldfield, Nev., Tonopah and Ely on account of desert travel and consequent heat, your route lies to Fresno through Famosa, Dearborn, McFarland, Delano, Pixley, Tipton, Tulare, Goshen; to Sacramento, through Madera, Merced, Oakdale, Stockton, Lodi, Woodbridge, Galt, Arno, McConnell, Elk Grove.

To Reno, Nev., you can take either of

two good routes. You will skirt the southern shore of Lake Tahoe by following through Manlove, Mills, Natoma, Folsom, Blue Ravine, Green Valley, Rescue, Placerville, Camino, Riverton, Slippery Ford, Echo, Myers, Tallac, Bijou, Edgewood, Glenbrook, Carson City, Lakeview, Washoe, Steamboat Springs, Huffaker and Reno. The other option from Sacramento goes over the same road as far as Folsom, then heads in a northerly direction to Auburn, Bowman, Clipper Gap, Weimar, Colfax, Gold Run, Alta, Emigrant Gap, Cisco, Cascade, Soda Springs, Summit, Lake House, Truckee, Prosser House, Hobart Mills, Verdi and Reno. Truckee to Lake Tahoe affords a beautiful run.

Reno to Austin, Nev., is 184 miles, taking in the towns of Sparks, Derby, Wadsworth, Hazen, Leetsville, Fallon, Westgate, Austin. Eureka is 70 miles further, the road passing through the Blackwood Canyon. Elko is 106 miles distant and, except in bad weather, there s nothing to seriously bother the traveler.

TRYING OUT CAMP OUTFIT 8 MILES FROM SHENANDOAH, IA.

It is advisable to leave Eureka with a good supply of gasoline. Continuing to Hallick, Deeth, Wells, Fenelon and Toana, you reach Cobre, 94 miles. At Wells there is a dangerous railroad crossing for low-hung cars. It is 90 miles to Kelton, passing through Loray, Montello, Tacoma and Lucin. To reach Ogden it is 110 miles, routing through Curlew, Snowville, Blue Springs, Tremonton, Bear River City, Corinne, Brigham City and Ogden. Evanston, Wyo., can be reached n 7 hours and is a distance of 82 miles hrough Riverdale, Gateway Station, Pe- erson, Morgan, Devil's Slide, Croyden, Echo, Stone House, Emory, Castle Rock, Vasatch, Evanston.

Evanston to Rock Springs, 121 miles, passes through Fort Bridger, Liman, Granger, Bryan, Green River; to Medicine Bow, 187 miles, the towns are Baxter, Black Buttes, Bitter Creek, Table Rock, Tipton, Red Desert, Wamsutter, Rawlins, Grenville, Fort Steel, Hanna and Carbon. A run of 74 miles will take you to Booster Springs and Laramie, and 132 miles to Denver through Virginia Dale, Ingleside, La Porte, Fort Collins, Loveland, Berthoud, Longmont, Lafayette, Broomfield. You will be so near Estes Park on your way to Denver that you might branch off at Loveland to take it in, then continue to Lyons, returning to the main road at Longmont.

Denver to Colorado Springs, 69 miles, and Colorado Springs to Pueblo, 44 miles, routes through Littleton, Ascequia, Sedalia, Perry Park, Palmer Lake, Monument, Breed, Pike View, Colorado Springs, Kelker, Skinners, Fountain, Little Buttes, Buttes, Wigwam, Dawkins, Pinion, Bragdon, Eden and Grant avenue into Pueblo.

For running directions from Stockton, Cal., to Pueblo, Colo., you are referred to the Blue Book, volume 5.

LEWISTON TO BUTTE, MONT.

Lewistown, Mont.—Editor Motor Age—I have a brother in San Diego, Cal., who is contemplating a trip to Lewistown via Butte, Mont., and I would like to know the best route to follow. He expects to start about July 15.—R. A. H.

The shortest route, of course, is to Los Angeles, Mojave, Independence, Goldfield, Tonopah, Ely, etc., but it is advisable to go by way of San Francisco, Reno, and Eureka, as you will find better accommodations and entail less danger.

The Blue Book, volume 5, gives running directions as far as St. Anthony, Idaho, and it is well worth $2.50 to know at all times just where to turn, which of two or three roads to take, how many more miles travel is necessary to reach your night stop, etc. Lack of space limits giving anything more than the larger towns through which you pass. Los Angeles is 136 miles from San Diego and, except along the shore where new roads have been constructed and some sandy stretches abound, good dirt or macadam roads prevail.

The towns are La Jolla, Del Mar, Encinitas, Merle, La Costa, Oceanside, Stuart, Las Flores, San Luis Capistrano, Irvine, Tustin, Santa Ana, Anaheim, Fullerton, La Habra, Bethel, Whittier, Montebello and Los Angeles. One hundred and six miles through Hollywood, Calabasas, Newberry park, Camarillo, El Rio, Montalvo, Ventura, Carpenteria, and Summerland take you into Santa Barbara. The stretch to Pas Robles is by way of Goleta, Naples, Orella, Los Cruces, Los Olivos, Sisquoc,

HENRY FIELD AND FAMILY CAMPING IN SOUTHWEST IOWA

Garly, Santa Maria, Nipomo, Arroyo Grande, Edna, San Louis Obispo, Monterey, Santa Margarita, Templeton, Paso Robles, 151 miles.

It is 213 miles between Paso Robles and Frisco passing through San Miguel, Bradley, Jolon, Greenfield, Soledad, Gonzales, Salinas, San Juan, Gilroy, Madrone, Coyote, San Jose, Malpitas, Irvington, Alvarado, Mt. Eden, San Lorenzo, San Leandro, Fruitvale, and Oakland. A good road into San Francisco from San Jose is Santa Clara, Mayfield, Redwood, Belmont, San Mateo, Millbrae, Bolcoff, South San Francisco and Colma.

Oakland, Dublin, Livermore, Greenville, Alta Mont, Janney, Banta, and French Camp take you to Stockton, from which point to Reno, Eureka, Cobre, and Brigham City, Utah, you are referred to a communication in this issue headed Oilfields, Cal.

Pocatello, Idaho, is reached with 113 miles registered running through Deweyville, Cherry Creek, Malad, Arimo, McCammon, Onoyx, Inkom, and Portneuf; and the St. Anthony road leads through Ross Fork, Gibson, Blackfoot, Shelley, Idaho Falls, Rigby, Lorenzo, Rexburg and Salem.

Very careful inquiry should be made for the road to Bozeman, then continue to Logan, Lombard, Townsend, Helena, Silver, Wolf Creek, Canon, Cascade, Sand Coulee and Great Falls. It will not be difficult to secure directions in Great Falls for the rest of the trip.

ASKS FOR TEXAS ROUTE

Abilene, Tex.—Editor Motor Age—We are contemplating a trip to Rockport soon by way of San Antonio. Some garage men advise us to go via San Angelo, which is probably to avoid some bad going direct southeast from here.—C. H. Lewis.

Cattle trails are the style of roads you will have to San Antonio and many inquiries are necessary. You go through Menard, Junction, Ingram, Kerville, Boerne and San Antonio. You now follow the San Antonio Corpus Christi road as far as Sinton, passing through New Braunfels, Calaveras, Floresville, Poth, Falls City, Karnes City, Kennedy, Pettus, Beeville, Skidmore, Papalote, Sinton. You will be obliged to inquire at Sinton for the directions to Rockport.

In many places you will encounter bad stretches of sand. If you cannot drive through it, narrow strips of canvas laid under the tires will be a great aid. However, it is hardly probable that you will find it that difficult.

EUSTIS, FLA., TO COLUMBUS, O.

Eustis, Fla.—Editor Motor Age—What is the best route from Eustis, Fla., to Columbus, O., and what rivers have to be ferried?—T. W. Childs.

Motor to Orlando, Maitland, Longwood, Sanford, Monroe, Orange City, DeLand, Daytona, Seabreeze, Ormond. The road is very beautiful and follows through the great celery beds of Sanford to your first ferry crossing over the St. John's river. The fare is something like 50 cents.

Many bridges are encountered en route to Moultrie, St. Augustine and South Jacksonville, where the second ferry is reached which takes you into Jacksonville. The car and driver are taken across for 25 cents, and for each passenger the charge is 5 cents. About 1½ miles from Fort Moultrie you will pass the oldest house in America and it is well worth a stop.

Jacksonville to Brunswick, Ga., is 100 miles over mostly fair dirt roads through pine barrens with an occasional stretch of deep sand. After leaving Callahan the King's ferry will take the car across the St. Mary's river into Georgia, charging $1. Sixteen miles more and the Owen's ferry is needed, also with a charge of $1. Tarboro, Brookman and Old Sterling land you in Brunswick.

About 14 miles can be saved by taking a short-cut to Sterling and Dent's Landing ferry, which will take you to Darien. This is an hour's trip and will cost $5 for a single car. Shortly after leaving Eulonia you strike a bad stretch of corduroy road and cross several bridges to Riceboro, continuing to Midway cemetery, Freedman's Grove and Savannah. There is a fine gravel road leaving Savannah and from Blitchton to Stilson, Statesboro, Rockyford, Scarboro to Millen, then gravel again to Perkin, Waynesboro, McBean and Augusta.

Augusta to Atlanta is 171 miles, following through Bonesville, Thomson, Crawfordville, Union Point, Greensboro, Madison, Rutledge, Social Circle, Covington, Rockdale, Lithonia, Redam, Stone Mountain, Scottdale, Ingleside, Decatur, Georgian Terrace and Atlanta.

Atlanta to Greenville, S. C., is over mostly rolling country on dirt roads with several bad sandy stretches and is a distance of 189 miles, passing through Decatur, Ingleside, Scottdale, Clarkson, Stone Mountain, Snellville, Lawrenceville, Auburn, Winder, Jefferson, Commerce, Pocataligo, Franklin Springs, Royston, Canon, Bowersville, Lavonia, Anderson, Piedmont, Oak Grove, Oakvale, Greenville. Asheville is a popular summer and winter resort, 60 miles from Greenville, and you might care to pay it a visit, by motoring through Tuxedo, Hendersonville, Hillgirt, Fletcher, Arden and Biltmore.

Over macadam roads the greater part of the way Charlotte, 116 miles distant, is reached via Greer, Duncan, Spartanburg, Converse, Gaffney, Blacksburg, Grover, Kings Mountain, Bessemer City, Gastonia, Lowell, Belmont and Charlotte.

Over rolling country you pass 136 miles to Winston-Salem, running through Newell, Concord, Kannapolis, Landis, China Grove, Salisbury, Spencer, Lexington, Thomasville, High Point, Jamestown, Greensboro, Guilford Battlegrounds, Summerfield, Kernersville, Centerville, Winston-Salem. At Kernersville you can keep on towards Roanoke through Stokesboro, Ellisboro, Madison, Stoneville, Ridgeway, Martinsville, Oak Level, Syndorville, Rocky Mount.

A good road, either dirt, macadam or stone, takes you to Hagerstown through Cloverdale, Troutville, Buchanan, Natural Bridge, Fancy Hill, Lexington, Timber Ridge, Fairfield, Midway, Greenville, Minto Springs, Staunton, Burkstown, Mt. Crawford, Harrisonburg, New Market, Edinburg, Woodstock, Maurertown, Strasburg, Middletown, Winchester, Martinsburg, Williamsport, Hagerstown. This is a distance of 223 miles and the last 134 miles between Staunton and Hagerstown entails the sum of $5.50 in tolls passing through twenty-two tollgates. Three more tollgates are encountered en route to Greencastle and Chambersburg, where you head west for Bedford and pass through Ft. Loudon, McConnellsburg, Breezewood and Everett, with six more tollgates.

The following is the longest, but best of three possible routes to Pittsburgh, traversing mountain paths where a watchful eye and brakes that will give you quick action are necessary. The last 33 miles, however, is a macadam road. The towns are Fishertown, Windber, Geistown, Johnstown, Blairsville, New Alexandria, Greensburg, Adamsburg, East McKeesport, Wilmerding, Wilkinsburg and Pittsburgh.

The balance of the trip lies over the National road through Carnegie, Canonsburg, Washington, Elm Grove, W. Va., Wheeling, Bridgeport, O., St. Clairaville, Hendricksburg, Fairview, Elizabethtown, Cambridge, New Concord, Norwich, Zanesville, Mt. Sterling, Hopewell, Gratiot, Brownsville, Jacktown, Hebron, Kirksville, Etna, Reynoldsville and Columbus.

The Blue Books Nos. 3 and 4 will give you complete running directions from Orlando to Columbus.

DENVER TO INDIANAPOLIS

Fort Morgan, Colo.—Editor Motor Age—Please give information in regard to the transcontinental road from Denver, Colo., to Indianapolis, Ind.—R. H. Sims.

The Golden Belt line is a good road to follow from Denver across the state of Kansas. It takes you to Limon through Watkins, Bennett, Strausburg, Byers, Peoria, Deer Trail, Agate, River Bend and to the state line via Genoa, Bovina, Arriba, Flagler, Seibert, Vona, Stratton, Bethune, Burlington.

To Wilson, Kan., the towns are Kanorado, Goodland, Levant, Colby, Mingo, Oakley, Campus, Grinnell, Grainfield, Quinter, Collyer, Voda, Ogallah, Ellis, Hays, Victoria, Walker, Russell, Bunkerhill, Dorrance and Wilson. The Wilson-Topeka stretch lies through the towns of Ellsworth, Kanopolis, Carneiro, Brookville, Salina, Solomon, Detroit, Chapman, Junction City, Fort Riley, Ogden, Manhattan, Wamego, Belvue, St. Mary, Rossville, Silver Lake, Topeka. Kansas City is reached

Owner Should Study Tires

A. D. Carpenter Gives Good Advice as to Care of Pneumatics

SAUK CENTER, Minn.—Editor Motor Age—The tire is the most used of any part of the motor car and usually gets the least care. This is not as it should be, for so important a part—in fact, the most important part—should get the best possible care. I am a great friend of the motor car and more especially its tires, which have the duty of carrying the whole of the car as well as its load, and am very careful of them when in as well as out of use, and the result of this treatment is a very long life in all tires I have used.

The amount of pressure on a tire from the outside must be relative to the pressure on the inside, and a heavily-loaded tire with light pressure on the inside will not give the mileage that the tire properly inflated will give. This is the way you can get the amount of load your tire will carry: Go to a good platform scale and weigh the whole car, tanks full, tools, passengers which it is to carry and then run the front wheels off of the scales, allowing the rear end of the car to remain, then weigh carefully. Now you can back the rear wheels off of the scales, allowing the front ones to be in the middle of the platform of the scales as possible, then weigh carefully as you did the rear part of the car and divide by two, which will give the weight each of the front wheels will be called upon to carry, the same of the rear wheels.

Now take your list of weights tires are rated to carry by the manufacturers and find the size of the tire you have on your car, and you will readily see if the tires are overloaded or not. You must bear in mind that the pressure stated in this list must be had and kept constantly in each tire, for if you are to get 12,000 to 15,000 miles service from a tire you must be sure you use it as experience has positively proven to be the best. No feeling with the fingers or kick from the shoe will answer as to the pressure in the tire, but you must use a good, reliable gauge and test your tires every time you are going to use them, for a small leak will run a tire down when you least expect it, to say 10 or 15 pounds, and this loss of air will cause the fabric walls of the tire to work excessively and destroy them, resulting in blowouts, rimcuts, etc. A good pump with reliable gauge attached is as much a necessity as oil and a small pocket gauge also must be kept at hand to test tires when about to use them. The pump gauge will tell you when pumping up the tires when you have enough air, and the pocket gauge will tell you afterwards how much you have in the tire.

A tire, for instance, say, 30 by 3 inches, to carry 500 pounds, ought to have 60 pounds pressure, while one of 36 by 4½ inchs to carry, say, 1,300 pounds, should have a pressure of 80 pounds. These figures are varied a trifle by the different makers of tires, and one can readily learn from the maker of the tires he uses just the proper amount of air they are made to carry; also the load per wheel.

I never have seen a tire blow out, even when old and badly used up, which had been treated to plenty of air during its life, and have worn them down to the fabric on my own car. All small cuts in the rubber must, of necessity, be promptly repaired as soon as made in order to keep the water out, thereby preventing rotting of the fabric. The various good compounds on the market will do very well unless too badly injured, in which event the small vulcanizer now to be had at from $6 to $12 should be used. I keep one of them and use it when the casing needs it, and it is the best invested money in the motor line I have. With tires it is a stitch in time saves nine. You cannot get good tire mileage without watching pressure and surface cracks.—A. D. Carpenter.

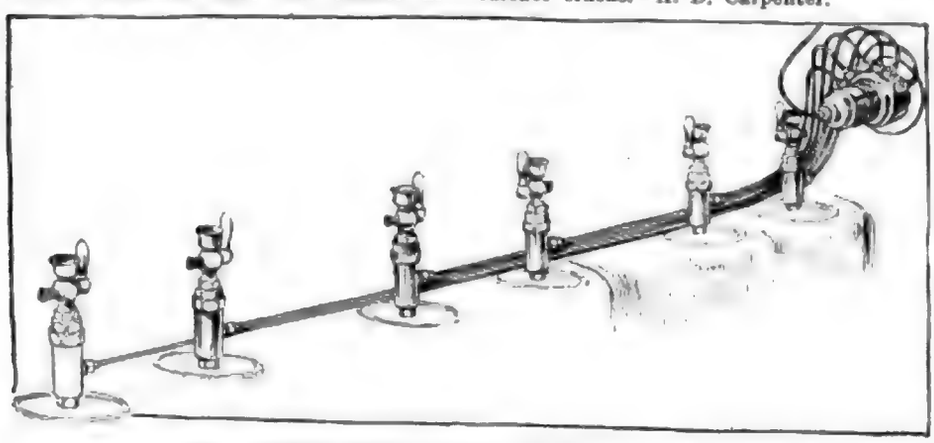


FIG. 1—DISCO SELF-STARTER FOR SIX-CYLINDER MOTOR

The Readers'

Road Money to Counties

Illinois Commissioner Comments on Disposition of Fund in His State

BEARDSTOWN, Ill.—Editor Motor Age—I have noticed from time to time articles in Motor Age in regard to Illinois motor car registration money. I understand the idea is to build a state highway from Chicago to St. Louis. I want to say I am a fanatic on good roads and have been instrumental in a way in building some in Cass county. Therefore, I would like to offer a suggestion as to the disposal of the motor car and chauffeurs' registration fees. My idea is that each county should handle its respective license money. The licenses could be issued by the county clerk and the expense would be only a trifle. It would take no more time than it does to issue hunters' licenses. In this way no one could escape paying his share, whereas when collection is made by the state, and the nearest officials are in Springfield, a number of owners of motor cars never get that far, and therefore pay no license. But if the licenses were paid within the county a county good roads fund could be created and in a few years a sufficient amount would have accumulated to build some good hard roads. I think that each county should have the privilege of handling this motor car money itself, and in this way we would not have to pay out about half of it for clerk hire and several other expenses which at present eliminate so much of these funds.

I think there will be a bill before the next general assembly to that effect. Cass is a very small county, and, while we are not out as much as the larger counties, I think we are entitled to what belongs to our citizens. I am not fully informed as to what these registrations annually amount to in this county, but it will be in the neighborhood of $1,000 to $1,200, and in a few years we could build a nice piece of road, and our citizens are entitled to it, whereas if the state highway is built from Chicago to St. Louis we would receive no benefit from it and we would have to travel over 50 miles of dirt road to reach it.—George F. Kuhlman, county commissioner of Cass county.

The present status of the Illinois road fund is that the legislature has deferred distributing $393,000, which is in the fund, among the townships because each township would get such an infinitesimal sum that it would do little good if spent on the roads. While cross-state highways have been suggested, no action has been taken in the matter.

Clearing House

Self-Starter Operation

Description of the Disco and Features of Its Construction Are Given

PEORIA, Ill.—Editor Motor Age—Please tell me some good method for repairing leaky radiators fins.

2—Also, would like a complete description of Disco self-starter and diagram of same for six-cylinder motor.—C. E. Moore.

1—Use one of the radiator compounds advertised in Motor Age.

2—The principle on which the Disco starter for six-cylinder motors, illustrated in Fig. 1, operates consists of the injection of acetylene gas into each of the cylinders. A small brass tube ⅛ inch in diameter is attached to a T-piece on the tank, making it possible to regulate the lighting system separately from the starting system. The gas is conducted by a brass tube to the distributing or starting valve on the dash.

Adjustment at the valve on the tank is accomplished by adjusting a needle valve in the distributing valve on the dash. The gas enters the distributing valve from the tank and it is controlled by a taper-seated valve. In addition to the taper-seated valve there is another taper valve in the distributor which has drilled through it, and connecting with the taper seat, a hole about 1/16 inch in diameter. This hole is in the same plane as four other holes on the outer and large diameter of the distributing valve and to which four ⅛-inch tubes are connected, leading to the cylinders. The priming cocks are somewhat raised on account of an extension being used, having in it a ball check, this to prevent any gases from returning to the distributing valve.

All that is necessary to start the motor is to give the crank on the dash one continuous turn. This turn of the crank lifts the small taper valve in the distributor off from its seat and allows the gas to flow through a by-pass and to another chamber in the distributor which contains the distributing valve.

EASY RIDING CAR

Milwaukee, Wis.—Editor Motor Age—I am trying to get an easy-riding four-cylinder two-passenger car without unnecessary wear on tires by loading down the rear end with 40 to 50 superfluous gallons of gasoline and several tire casings. Suppose a car about 116-inch wheelbase was built with the engine at the rear and a shaft extending to the transmission forward of center; a shaft from the differential extending forward to a point under the transmission and connected with it by wide silent chain. This would cause some friction, as there would be no direct drive. With the radiator in the dash and a strong pump, the cooling would be sufficient. Would this weight at the rear end with the fore end light cause unusual skidding? What does Motor Age think of it?—W. H.

Although the transmission system which you have designed, illustrated in Fig. 2, will work satisfactorily, it does not seem that the advantages to be obtained by placing the motor at the rear would offset the slight added complication of parts and the necessity of extra bearings and slight loss in efficiency which that arrangement would necessitate. There are two points which would seem to make this location of the motor inadvisable, the first and weightiest of which is the fact that it will be difficult to provide accessibility of the motor in this location, particularly if the conventional type of body is to be used. This location of the motor was employed in some of the first models in the early days of motoring, but was discarded for the present location.

So far as skidding is concerned, this need not trouble you greatly, because your skidding will be quite materially reduced when the weight is placed over the rear axle, when driving on a straightaway, but in turning corners the liability of skidding will be somewhat greater than with the ordinary type of chassis.

With your arrangement you will have improved traction certainly, but it is doubtful if the improvement in traction will much more than overcome the extra loss in efficiency in your transmission.

There will be a question, also, as to the load you are putting on your rear tires. Certainly if the greater part of the passenger weight is added to the motor weight on the rear tires they will be somewhat overloaded. To this tire overload must also be added the driving torque of the wheels, so that your rear tires will have to be much heavier than used on standard design of cars. The net result of your design is not high. If you want the motor at the rear, mount it transversely and drive by silent chain.

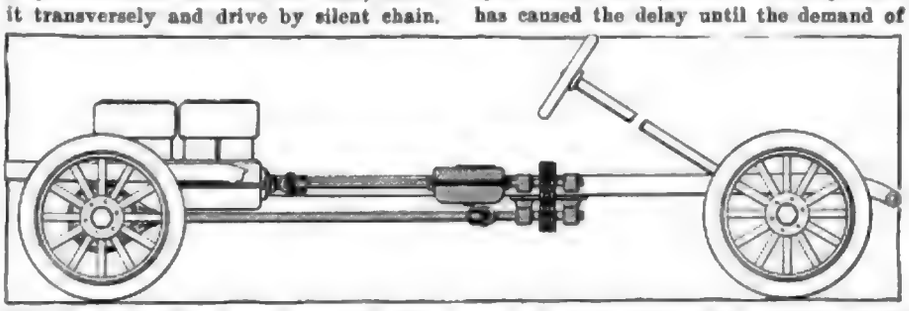


FIG. 2—DESIGN FOR EASY-RIDING MOTOR CAR IN WHICH MOTOR IS LOCATED OVER THE REAR AXLE AND GEARBOX LOCATED CENTRALLY BETWEEN THE AXLES

Four-Speed Gearset Next

Engineer Cameron Declares that Americans Will Follow the Foreign Practice

KALAMAZOO, Mich.—Editor Motor Age—The next radical change in motor car engineering will be the general adoption of the four forward speed gearset. It is my opinion the four-speed gearset is bound to become generally used in all good American cars.

Today it is found in this country only in the highest-priced cars. You can count on the fingers of one hand the cars selling under $3,000 that now have four forward speeds. Abroad, where special reasons have forced the use of the four-speed gearset in the large majority of cars, its advantages are better understood.

One reason for its use on foreign cars is the extremely small bore of the cylinders, due to the fact that the tax is graded by the size of the bore. An American car of more than 4-inch bore has little demand in England, where a bore of 3 and a fraction inches is generally used with an extremely long stroke, to give the maximum horsepower.

Under such conditions the four-speed gearset is positively essential, both to economize the power and to gain the required flexibility of control. Its use under these conditions, however, only serves to illustrate the actual money-saving in fuel and less strain upon the machine, as well as the advantages in driving which will come with the widespread adoption of the four-speed gearset in America. For the same engineering principles apply in our case as in theirs.

Before passing the point of economy, the tendency in America will be decidedly to smaller bore. This is due to the fact that everybody knows gasoline is becoming scarcer and is sure to mount in price. I think the small bore is coming, even with the effort to popularize the six-cylinder car. The popular six-cylinder car of the future will be one with about the same piston displacement as the standard fours of the present.

The four-speed gearset has been confined to high-priced cars in America, primarily because of its prohibitive cost. Engineers and manufacturers almost unanimously admit the great advantage of four speeds over three, but the cost question has caused the delay until the demand of

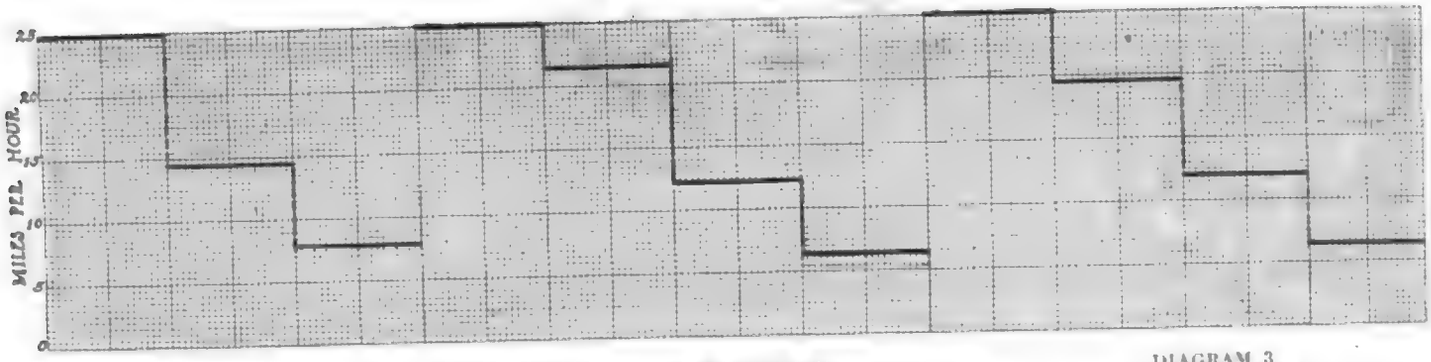


FIG. 3—DIAGRAM 1 DIAGRAM 2 DIAGRAM 3

These three diagrams show graphically the difference in the three different styles of gearsets. No. 1 shows the three-speed in which you will notice the gap between second and high. In fact, it looks as if something were missing. No. 2 shows the four-speed with the indirect fourth. You will see that the third and fourth are very close together; and yet in use they are really closer together, due to the inefficiency of the gears. No. 3 shows what I claim to be the proper ratios with all speeds about equally spaced in a four-speed gearset

car buyers has become imperative. It means a complete change of design—more gears, wider gear centers—a big expense for the improvement when all are totaled. But the advantages to be gained from it are certainly so manifest, so great, that it is a question of only years when it will be generally accepted. And with our roads the four-speed gearset comes to general practice none too soon.

Motorists generally realize now that the life of a car depends upon its use and abuse. It does not take a car owner long to reason to the fact that making a car put forth every ounce of power on frequent grades is highly detrimental.

"Learn to control your car exclusively by the gas, as far as possible," says the instructor in motoring to the school. The salesman says the same thing to the beginner who has purchased his car, in 99 cases out of 100. Everybody who gives advice on running a car says it, thereby admitting that something is wrong or lacking in the transmission. Yet everybody realizes on a moment's reflection that the transmission is the logical first means for the control of the speed.

Now, it takes long experience and special aptness—I may say genius—for driving to know just how far to throttle in regulating a car by gas. Few ever learn it perfectly. The driver who does it with any degree of skill knows his car like a human friend and is also guided by some sixth sense of intuition. With the big majority this dependence almost entirely on the gas for regulating the car is a matter of guesswork. It is disastrous not only to the pocketbook but in not a few cases to human life.

It costs money to pull the engine speed down until the car almost quits on high, and then to race the engine to pick up on second, as is so commonly practiced.

We have grown used to the sight of the driver on high gear, killing his motor at street crossings, street car tracks and railroad tracks, by throttling down before he can get his clutch out.

If instead he slips into third speed on a proper four-speed gearset he has a gear ratio which is practically the same as a 4.5 to 1 rear axle—by having which, as anyone knows, the car can easily be throttled down to 2 or 3 miles an hour and still pick up quickly.

By this time it should not be necessary to explain that the basic purpose of a four-speed gearset is not to satisfy a mania for more speed. This was a common error when the four-speed set was rare practice. The four-speed set provides an efficient, feasible and logical control of the car—a control not based on guesswork, but upon an accurate, proved and dependable gearbox, built in accordance with universally acknowledged mechanical principles and in accordance with the best engineering practice the world over.

It provides this control without wasting the fuel, without racing the motor, and consequently with much less vibration. It relieves the motor of undue strain, especially in taking heavy grades. With four speeds, the direct drive being on the fourth, the long sand stretches, the heavy mud roads, the miles of axle-deep slush, the hills and mountains, may be negotiated without fear of punishing the motor in the way that now works havoc and shortens by years the life of the best car built.

Unless one has actually driven with a four-speed gearset he or she does not know the satisfaction and pleasure that it adds to driving. To those who have not tried it I would say: Make a test of two cars, one with a proper four-speed gearbox, and the other with three speeds, both having the same top-gear ratio, and thus having the same speed possibilities. You will be amazed at the difference in efficiency of control, the certainty of having just the speed you want when you want it, the reduction of the work of driving. You will never want to go back to a three-speed set.

Grade-climbing is one of the problems most satisfactorily solved by the four-speed gearbox. Every motorist knows that unless he has an engine on which he can depend for a practically unlimited pull he will find the inclination of many grades just a trifle too much for his top speed. On such a grade with a four-speed gearbox he can drop to third speed and it takes his car up like a bird. With a three-speed car he has to drop from top speed to second, and he makes an awful drop—in fact, almost 50 per cent lower than high. The same condition is encountered in many roads which are just a little too heavy for top speed. The funeral pace then has to be taken on second speed, although the car is actually capable of much better speed on these roads.

We shall understand the necessity of the four-speed gearset more perfectly if we say that while the speed ratios of a proper four-speed car are 1, 2, 3, 4, the fourth being the top speed, the speed ratios of a three-speed car are really 1, 2, 4—the gap between second and high being so great that there is really no third speed. So when we put in a four-speed gearbox we are actually adding a third speed to the car.

I have talked to many veteran motorists, and they agree with me that the four-speed gearbox is needed everywhere, every day, not only to climb grades, and not only to do away with unnecessary engine racing, but to provide a really essential speed between second and high, where the gap now exists.

The greatest question in a four-speed gearset is the ratios of the gearing, or the number of times the motor must turn over to the number of revolutions of the rear wheels. The subject has engaged the attention of the leading engineers in Europe and America for several years, but it is only lately that they have practically agreed as to the direct drive.

There are two types of four-speed gearsets: one direct on third speed, the other direct on fourth. The latter is generally conceded to be greatly in advance of the former. This is overwhelmingly proved by the practice on the great majority of cars now using the four-speed gearbox. Of 157 four-speed foreign cars, 132 have the direct drive on fourth. Of the American cars now using four speeds, 75 per cent have the direct drive on the fourth. In fact, as the four-speed gearbox gains in favor the indirect fourth will drop out over night.

A study of the tables and diagrams shown herewith will enable you to see the difference at a glance.

Table 1 shows a common three-speed

Current Motor Car Patents

PATENTS ISSUED JULY 2, 1912

1,030,858—Means for Supporting Spark Coil Cases. Butler Ames, Lowell, Mass. Filed September 5, 1911. Serial No. 647,488.

1,030,884—Dumping Wagon. Jeremiah Ganey, Chicago, Ill. Filed March 29, 1912. Serial No. 687,023.

1,030,890—Valve. Raymond D. Johnson, Niagara Falls, N. Y. Filed October 8, 1909. Serial No. 521,729.

1,030,911—Automatic Check Valve for Inflamable Gases. Henry B. Migliavacca, Napa, Cal. Filed June 12, 1911. Serial No. 632,686.

1,030,924—Resilient Wheel. Charles L. Schwarz, Philadelphia, Pa. Filed April 10, 1911. Serial No. 619,936.

1,030,927—Engine Valve Mechanism. Nathaniel S. Seeley, Flushing, N. Y. Filed February 12, 1910. Serial No. 543,434.

1,030,931—Gasoline Engine Primer. Eugene Silver, Omaha, Nebr. Filed January 27, 1912. Serial No. 673,841.

1,030,945—Jack. Orlan E. Tope, Jackson, Ohio. Filed September 14, 1911. Serial No. 649,231.

1,030,946—Resilient Vehicle Wheel. Jeff D. Van Atta, Ashford, Ariz. Filed February 27, 1912. Serial No. 680,278.

1,030,984—Resilient Tire. Oscar H. Duckworth, Summerfield, Kan. Filed August 21, 1911. Serial No. 645,091.

1,030,016—Electric Device for Explosive Engines. Charles T. Mason, Sumter, S. C. Filed September 30, 1910. Serial No. 584,690.

1,031,020—Wind Shield. George F. Murphy, New Haven, Conn. Filed January 18, 1911. Serial No. 603,228.

1,031,028—Vehicle Spring. William Roper, Philadelphia, Pa., assignor of one-fourth to Theodore F. Oechsle, Philadelphia, Pa., and one-fourth to Malcolm J. McLeod and one-fourth to Thomas Conway, Detroit, Mich. Filed January 27, 1912. Serial No. 673,806.

1,031,038—Electromotive Device. Charles F. Burgess, Madison, Wis. Filed February 12, 1910. Serial No. 543,528.

1,031,062—Motor Plow. Leslie S. Hackney, St. Paul, Minn. Filed August 14, 1911. Serial No. 643,922.

1,031,063—Grader Attachment for Traction Vehicles. Leslie S. Hackney, St. Paul, Minn. Filed September 23, 1911. Serial No. 650,976.

1,031,064—Steering Device for Traction Vehicles. Leslie S. Hackney, St. Paul, Minn. Filed September 28, 1911. Serial No. 651,816.

1,031,065—Steering Device for Traction Vehicles. Leslie S. Hackney, St. Paul, Minn. Filed November 3, 1911. Serial No. 658,433.

1,031,090—Elastic Suspension for Vehicles. Henri Roze, Domaine de Haute-Fontaine, France. Filed August 8, 1911. Serial No. 642,998.

1,031,097—Toothed Cylinder. Frank C. Stevens, North Andover, Mass., assignor to Davis & Furber Machine Co., North Andover, Mass., a corporation of Massachusetts. Filed August 14, 1908. Serial No. 448,514.

1,031,098—Spring Wheel. Robert Stock, Silver Creek, N. Y. Filed September 14, 1910. Serial No. 581,935.

1,031,131—Multicylinder Gas Engine. Samuel James Macfarren, Pittsburgh, Pa. Filed June 13, 1904. Serial No. 212,241.

1,031,134—Spring Device for Starting Automobiles. Alexander Markmann and Willy Stauter, Dusseldorf, Germany, assignors to Carl Markmann, Dusseldorf, Germany. Filed December 1, 1911. Serial No. 663,337.

1,031,147—Spray Carburetor. Gottfried Flumm, Berlin, Germany. Filed May 2, 1911. Serial No. 624,638.

1,031,166—Safety Cranking Attachment for Explosive Engines. Frank Brayer and Sidney L. Long, Minneapolis, Minn.; said Brayer assignor to Guido J. Albrecht, Minneapolis, Minn. Filed April 12, 1911. Serial No. 620,688.

1,031,193—Transmission Gearing. Horace L. McCurdy, Coleman, Tex. Filed November 26, 1910. Serial No. 594,389.

1,031,194—Lifting Jack. Israel H. Murdick and Charles J. Garey, Benton Harbor, Mich. Filed October 31, 1911. Serial No. 657,790.

1,031,222—Driving Shaft for Automobiles. Alexander Winton, Cleveland, Ohio. Filed April 29, 1907. Serial No. 370,968.

1,031,233—Tire Tool. John H. Blake, Portland, Ore., assignor of one-half to Lewis P. Davidson, Ione, Ore. Filed October 9, 1911. Serial No. 653,594.

1,031,235—Motor Car Wheel Rim. Percy B. Bosworth, Akron, Ohio, assignor to the Firestone Tire & Rubber Co., Akron, Ohio, a corporation of Ohio. Filed June 4, 1910. Serial No. 565,083.

1,031,236—Vehicle Wheel Rim. Percy B. Bosworth, Akron, Ohio, assignor to Firestone Tire & Rubber Co., Akron, Ohio, a corporation of Ohio. Original application filed December 24, 1909. Serial No. 534,873. Divided and this application filed June 4, 1910. Serial No. 565,084.

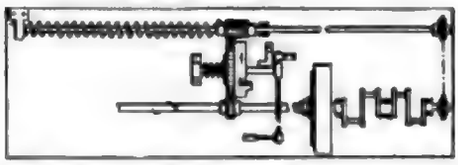


FIG. 2—GERMAN SPRING SELF-STARTER

1,031,240—Clutch. William H. Cameron, Toledo, Ohio, assignor to the Willys-Overland Co., Toledo, Ohio, a corporation of Ohio. Filed July 10, 1911. Serial No. 637,729.

1,031,246—Gas Engine. George E. Claus, Detroit, Mich. Filed May 11, 1908. Serial No. 432,167.

1,031,259—Demountable rim for Motor Car or Other Wheels. Martin Halfpenny, Pontiac, Mich. Filed October 2, 1911. Serial No. 652,431.

1,031,269—Spring Wheel. William R. Ihrig, Withers Mills, Mo. Filed July 17, 1911. Serial No. 639,026.

1,031,275—Lock Joint for Wind Shield. Alexis Krah, New Haven, Conn., assignor to the English & Mersick Co., New Haven, Conn., a corporation. Filed March 4, 1912. Serial No. 681,395.

1,031,308—Automatic Starter and Lighter for Motor Cars. William G. Wordingham, Chicago, Ill., assignor to Wordy Self Starter Co., Chicago, Ill., a corporation of Illinois. Filed November 8, 1911. Serial No. 659,082.

1,031,337—Feed Wire Connection for Electric Motors. George J. Hartmann, White Plains, N. Y. Filed November 11, 1911. Serial No. 659,712.

1,031,341—Vehicle Wheel. William L. Howard, Trenton, N. J. Filed May 6, 1911. Serial No. 625,923.

1,031,347—Steering Apparatus for Motor Vehicles. Frank E. Lake, Guadalajara, Mexico. Filed July 24, 1907. Serial No. 385,391.

1,031,381—Shock Absorber. Herman H. Schmitt, Creswell, Ore. Filed March 4, 1912. Serial No. 681,383.

1,031,384—Headlight. Brady M. Sheets, Milton, W. Va. Filed November 17, 1910. Serial No. 592,876.

1,031,394—Spring Suspension. Frank B. Stratford, Jersey City, N. J. Filed October 24, 1910. Serial No. 588,806.

1,031,398—Dirigible Motor Car Lamp Brackett. Charles H. Tiedemann, Buffalo, N. Y., assignor of one-half to William S. Brickell, Buffalo, N. Y. Filed June 19, 1911. Serial No. 634,175.

1,031,409—Grease Cup. Oscar Zerk, Cleveland, Ohio, assignor to the Zerk Mfg. Co., Cleveland, Ohio, a corporation of Ohio. Filed August 16, 1911. Serial No. 644,423.

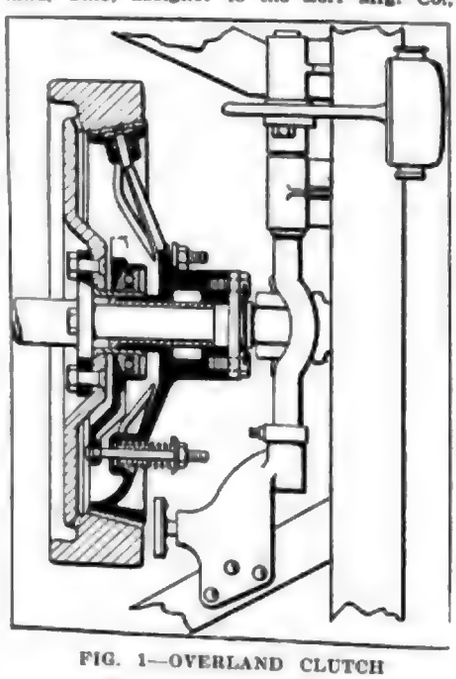


FIG. 1—OVERLAND CLUTCH

1,031,416—Tire. Herman A. Brandenberger, St. Louis, Mo. Filed May 27, 1911. Serial No. 629,835.

1,031,436—Spring Tire. Thomas Gilbert-Russell, Lyndhurst, England. Filed August 22, 1910. Serial No. 578,452.

1,031,469—Tire Shoe Support. Horace W. Roberts, Allentown, Pa. Filed September 8, 1910. Serial No. 581,059. Renewed April 27, 1912. Serial No. 693,558.

1,031,497—Motor Car Engine and Transmission Suspension Device. Joel W. West, Omaha, Nebr. Filed March 19, 1909. Serial No. 484,597.

1,031,523—Tire. Kelley Chambers, Elkmont Springs, Tenn. Filed October 7, 1910. Serial No. 585,848.

1,031,530—Spring Tire for Vehicle Wheels. Moyland E. Courtney, Fairplay, Mo. Filed May 31, 1911. Serial No. 630,286.

1,031,534—Tire Protector. Alfred H. Day, Waco, Tex. Filed January 13, 1912. Serial No. 670,990.

1,031,537—Speed Indicator. Raymond C. Dole and Charles Hinemeyer, Toledo, Ohio. Filed August 16, 1911. Serial No. 644,304.

1,031,583—Detachable Wheel. John Vernon Pugh, Allesley, England. Filed August 26, 1910. Serial No. 579,101.

1,031,612—Vehicle Spring. John Edward Anger, Preston, England. Filed July 30, 1910. Serial No. 572,828.

1,031,626—Spark Plug. Grover C. Davis, New York, N. Y. Filed March 10, 1911. Serial No. 613,620.

1,031,650. Starting Switch for Electric Motors. Charles D. Knight, Schenectady, N. Y., assignor to General Electric Co., a corporation of New York. Filed December 1, 1905. Serial No. 289,774.

42,690—Motor Car Signal. Joseph F. Kress, Daniel J. O'Connell and Louis N. Osmond, Philadelphia, Pa. Filed March 20, 1912. Serial No. 685,066.

OVERLAND Clutch—No. 1,031,240. William H. Cameron, Toledo, Ohio, assignor to the Willys-Overland Co., Toledo, Ohio. Filed July 10, 1911. Dated July 2, 1912. This device, Fig. 1, is substantially a double cone clutch, being applied to a specially formed flywheel, and consisting of a regular cone clutch, operating in conjunction with an auxiliary inverted cone, the former having a relatively large face or area, and the latter a relatively small surface. These clutches in operation are brought towards each other, engaging their respective bevels on the flywheel body, and are released by separation. The clutches are held normally in engagement by springs which exert a tension whose tendency is to draw them together, and are disengaged by a mechanical connection to a suitable pedal on the footboard of the car. Two angularities of face are provided, the lesser angle being on the inverted auxiliary clutch, which has a small area, and the greater angle being on the main clutch, which has a large face area. Springs and plungers are placed beneath the facing of the main clutch, to induce gradual action. A clutch brake is included in the mechanism to facilitate gear changes, which consists of a small stop against which the main clutch cone is brought to bear when disengaged. The object of this arrangement seems to be to reduce endthrust, by reason of the opposing action of the clutch members, and to provide increased

The Mathematics of Motoring

Circumferences and the Areas of Circles

IT OFTEN becomes necessary for the motorist to calculate the areas or circumferences of circles in finding out points about his car or planning changes in it. Such figures as piston displacement, the capacity of fuel tanks, etc., require the calculation of the area of the cylinder or tank, which multiplied by the length gives the capacity or volume. In figuring gear ratios, etc., it is necessary to be able to find the circumference of the wheel from its diameter.

To find the circumference of a circle from its diameter it is only necessary to multiply the latter by 3.1416. This is a constant which is usually indicated by the Greek letter π, pronounced "pi" like "pie." For instance, the circumference of a wheel 32 inches in diameter is found as follows:

$$32 \times 3.1416 = 100.53 \text{ inches}$$

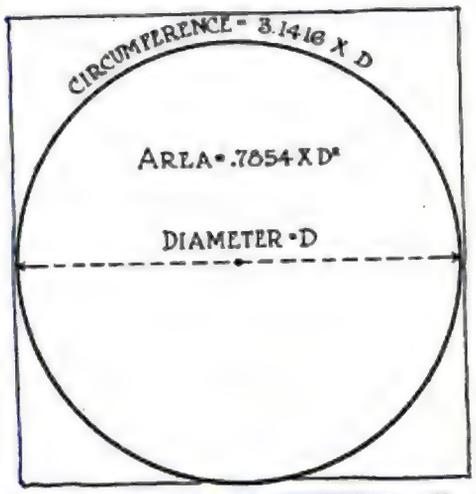
That is, a car with 32-inch wheels will go forward 100.53 inches each time the wheel turns over.

To find the area of a circle from its diameter, multiply the square of the diameter by $\frac{1}{4}\pi$. One-fourth of 3.1416 is .7854; so if D represents the diameter, the

area equals $D^2 \times .7854$, or

area equals $D \times D \times .7854$

For example, the area of the head of



ILLUSTRATING MEASUREMENT OF CIRCLES

a piston 4½ inches in diameter is found as follows:

$$4\tfrac{1}{2} \times 4\tfrac{1}{2} \times .7854 = 15.904$$

And the piston displacement of a cylinder of that bore is

15.904 × stroke.

The accompanying table gives the circumference and areas of circles of varying diameters from 1/64 inch to 13½ inches inclusive.

In using the table locate in the first fourth, seventh or tenth column the diameter in inches of the circle whose circumference or area is required; opposite the diameter in the next column will be found the circumference of a circle with that diameter and in the next column to the right will be found the area of a circle of that diameter. Assume that it is desired to find the circumference and area of a circle of 4⅜ inches diameter. The diameter will be found in the bottom line of the fourth column, headed Diameter, Inches; the bottom line of the fifth column, headed Circumference, Inches, shows the circumference, in this case 13.744 inches; and the bottom figure of the sixth column, headed Area Square Inches, is 15.033, area in square inches.

It is of benefit to note that circumferences and areas of circles up to 27 inches in diameter may be obtained readily from the table, although it only shows those up to 13½ inches in diameter. For circles between 13½ inches and 27 inches in diameter, divide the diameter by 2 and multiply the corresponding circumference by 2 and the corresponding area by 4.

CIRCUMFERENCES AND AREAS OF CIRCLES

Diam. Inch	Circum. Inch	Area. Sq. In.	Diam. Inch	Circum. Inch	Area. Sq. In.	Diam. Inch	Circum. Inch	Area. Sq. In.	Diam. Inch	Circum. Inch	Area. Sq. In.
1/64	.04909	.00010	11/16	5.3014	2.2365	4 7/16	13.941	13.941	8 1/4	25.918	53.456
1/32	.09818	.00077	3/4	5.4978	2.4053	1/2	14.137	15.904	3/8	26.311	55.088
3/64	.14726	.00173	13/16	5.6941	2.5802	9/16	14.333	16.349	1/2	26.704	56.745
1/16	.19635	.00307	7/8	5.8905	2.7612	5/8	14.530	16.800	5/8	27.090	58.426
3/32	.29452	.00690	15/16	6.0868	2.9483	11/16	14.726	17.257	3/4	27.489	60.132
1/8	.39270	.01227	2	6.2832	3.1416	3/4	14.923	17.728	7/8	27.882	61.862
5/32	.49087	.01917	1/16	6.4795	3.3410	13/16	15.119	18.190	9	28.274	63.617
3/16	.58905	.02761	1/8	6.6759	3.5466	7/8	15.315	18.665	1/8	28.667	65.397
7/32	.68722	.03758	3/16	6.8722	3.7583	15/16	15.512	19.147	1/4	29.060	67.201
1/4	.78540	.04909	1/4	7.0686	3.9761	5	15.708	19.635	3/8	29.452	69.029
9/32	.88357	.06213	5/16	7.2649	4.2000	1/16	15.904	20.129	1/2	29.845	70.882
5/16	.98175	.07670	3/8	7.4613	4.4301	1/8	16.101	20.629	5/8	30.238	72.760
11/32	1.0799	.09281	7/16	7.6576	4.6664	3/16	16.297	21.135	3/4	30.631	74.662
3/8	1.1781	.11045	1/2	7.8540	4.9087	1/4	16.493	21.648	7/8	31.023	76.589
13/32	1.2763	.12962	9/16	8.0503	5.1572	5/16	16.690	22.166	10	31.416	78.540
7/16	1.3744	.15033	5/8	8.2467	5.4119	3/8	16.886	22.691	1/8	31.809	80.516
15/32	1.4726	.17257	11/16	8.4430	5.6727	7/16	17.082	23.221	1/4	32.201	82.516
1/2	1.5708	.19635	3/4	8.6394	5.9396	1/2	17.279	23.758	3/8	32.594	84.541
17/32	1.6690	.22166	13/16	8.8357	6.2126	9/16	17.475	24.301	1/2	32.987	86.590
9/16	1.7671	.24850	7/8	9.0321	6.4918	5/8	17.671	24.850	5/8	33.379	88.664
19/32	1.8653	.27688	15/16	9.2284	6.7771	11/16	17.868	25.406	3/4	33.772	90.763
5/8	1.9635	.30680	3	9.4248	7.0686	3/4	18.064	25.967	7/8	34.165	92.886
21/32	2.0617	.33824	1/16	9.6211	7.3662	13/16	18.261	26.535	11	34.558	95.033
11/16	2.1598	.37122	1/8	9.8175	7.6699	7/8	18.457	27.109	1/8	34.950	97.205
23/32	2.2580	.40573	3/16	10.014	7.9798	15/16	18.653	27.688	1/4	35.343	99.402
3/4	2.3562	.44179	1/4	10.210	8.2958	6	18.850	28.274	3/8	35.736	101.62
25/32	2.4544	.47937	5/16	10.407	8.6179	1/8	19.242	29.465	1/2	36.128	103.87
13/16	2.5526	.51849	3/8	10.603	8.9462	1/4	19.635	30.680	5/8	36.521	106.14
27/32	2.6507	.55914	7/16	10.799	9.2806	3/8	20.028	31.919	3/4	36.914	108.43
7/8	2.7489	.60132	1/2	10.996	9.6211	1/2	20.420	33.183	7/8	37.306	110.75
29/32	2.8471	.64504	9/16	11.192	9.9678	5/8	20.813	34.472	12	37.699	113.10
15/16	2.9452	.69029	5/8	11.388	10.321	3/4	21.206	35.785	1/8	38.092	115.47
31/32	3.0434	.73708	11/16	11.585	10.680	7/8	21.598	37.122	1/4	38.485	117.86
1	3.1416	.7854	3/4	11.781	11.045	7	21.991	38.485	3/8	38.877	120.28
1/16	3.3379	.8866	13/16	11.977	11.416	1/8	22.384	39.871	1/2	39.270	122.72
1/8	3.5343	.9940	7/8	12.174	11.793	1/4	22.776	41.282	5/8	39.663	125.19
3/16	3.7306	1.1075	15/16	12.370	12.177	3/8	23.169	42.718	3/4	40.055	127.68
1/4	3.9270	1.2272	4	12.566	12.566	1/2	23.562	44.179	7/8	40.448	130.19
5/16	4.1233	1.3530	1/16	12.763	12.962	5/8	23.955	45.664	13	40.841	132.73
3/8	4.3197	1.4849	1/8	12.959	13.361	3/4	24.347	47.173	1/8	41.233	135.30
7/16	4.5160	1.6231	3/16	13.156	13.772	7/8	24.740	48.707	1/4	41.626	137.89
1/2	4.7124	1.7671	1/4	13.352	14.186	8	25.133	50.265	3/8	42.019	140.50
9/16	4.9087	1.9175	5/16	13.548	14.607	1/8	25.525	51.849	1/2	42.412	143.14
5/8	5.1051	2.0739	3/8	13.744	15.033						

Aeroplanes	1
Aeroplanes	2
Aeroplanes	3
Aeroplanes	4
Aeroplanes	5
Aeroplanes	6
Aeroplanes	7
Aeroplanes	8
Aeroplanes

Carriages in the Imperial City

The Illustrated London News
Saturday, Jan. 1, 1938 Price 6d.

Commercial

Some Substitutes for Mexican Guayule

Editor's Note—Monograph published by Professor Julio Morpurgo, of the commercial museum of Trieste, Austria, on the occasion of the installation of the first collection of Mexican products at Trieste, in 1908. Translated by Professor Mario Calvino into Spanish, and published by the department of the interior of the Mexican government.

OWING to the increased importance of the rubber plant and the constantly rising inquiry for this product, which is now used in so many technical applications, it has been asked, not without reason, in some industrial centers, whether at some not very distant date the consumption might not be likely to exceed the production. This circumstance called forth numerous studies and chemical investigations on the nature of rubber and similar natural products. If it has not been possible so far to produce rubber through chemical synthesis, there are still in the extensive modern literature on this product quite sufficient results from the theoretical studies to make us clearly acquainted with the intimate nature of the rubber plant, so that we know it now as well as the various kinds of fats, resin, gum arabic and other products of the vegetable world that are employed in technics. See 1, author's notes.

Favorable Results Attained

In the practical domain also favorable results have been obtained by the chemists who devoted themselves to the search for substitutes for elastic rubber. They have found that certain combinations of fats and sulphur formed elastic masses that might in some cases take the place of elastic rubber.

These chemical products are called faktis and are now employed extensively in the manufacture of ordinary India rubber goods. If the faktis can serve in some cases to substitute the genuine rubber in determined mixtures it still represents in the majority of cases rather a falsification than a substitution, so that the problem of inexpensive rubber certainly has not found as yet its solution through the means of chemical products.

Elastic rubber is extracted from many plants, which pertain to different families—Euphorbiaceæ, Moraceæ, Apocyneæ, etc.—and which are found in very different parts of the earth. These plants abound in vessels that contain a milky juice or latex, which is made to trickle out through incisions. This latex is gathered, dried and coagulated, and in this form furnishes the crude India rubber, such as used in commerce. Not all kinds of crude rubber are equally pure, and the quantity of elasticity which they contain and which they can furnish after being submitted to refining processes varies a good deal, as well as the characteristic quality of the product obtained from different kinds of latex. The composition of the milky juice of the different plants and the greater or lesser care taken in separating the elastic rubber are responsible for this diversity of grade.

Raw rubber contains always in larger or smaller proportions, not only heterogeneous substances, such as particles of wood, sand and other substances that were mixed with the coagulating mass before it assumed the form of the commercial article, but also other substances of a gummy nature, which are found intimately connected with the caoutchouc itself and can be separated only by relatively complicated processes; so intense is the union of these component parts among each other. The presence of such resinous and gummy constituents modifies to a considerable extent the consistency of the product, so that raw rubber which has been obtained by some special processes has rather the appearance of brittle resin than that of elastic rubber.

The following table shows the total contents of heterogeneous and resinous matter of six different kinds of elastic rubber in the commerce:

Name	Total heterogeneous matter	Resinous elements
Fine Para	10.0%	3.5%
Sierra Lone	32.0%	3.1%
Congo Balls	24.0%	5.8%
Borneo I	18.0%	10.0%
Manoch Teist	42.5%	10.6%
Kamerun	38.0%	27.5%

The presence of large quantities of gummy and resinous elements can cover up other components in the nature of the elastic rubber that are found in the sap of some plants, making them brittle and paralyzing their elasticity, so that with only a superficial examination it is not possible to note the presence of the elastic elements in many latexes, which do still contain quantities of them.

Kassner Discoverer of Latex

So far as is known the first studies in connection with the tracing of the elastic rubber in the latex of many plants date hardly 20 years back. In 1885 Kassner, a German chemist, found in the latex of several plants and especially in that of the sonchus oleraceus L.—see paragraph 2—which is very common in Europe, elastic rubber in the proportion of about .18 per cent of the gross weight of the plant; but as yet no practical advantage has been derived from this discovery. In 1901 Fritsch published a dissertation in Monaco that also treated on the appearance of elastic rubber in the Hippocrataceæ.

Better success has resulted from some investigations made during the last years on the latex of some exotic plants, among which is to be placed in first rank the guayule.

The guayule, which is acquiring constantly more importance in commerce and industry, and which represents even now in trade a special class of elastic rubber, is extracted from the latex of the parthenium argentatum, of Gray, in Mexico. This plant, called by the natives huayle or guayule—see paragraph 3—is a shrub that grows in the steppes of the entire Mexican plateau—chapparrales, thick bramble bushes entangled with thorny shrubs in clumps—and especially in the districts of Chihuahua, in the southern part of the states of Zacatecas and San Luis Potosi, in the eastern part of Durango, and especially in the districts in the south of Coahuila. It varies in height from 20 centimeters to a meter—8 inches to 39 inches—and on an average reaches a height of 60 centimeters or 2 inches. The trunk is very branchy and covered with a gray bark; the leaves, which are at the end of the branches, are attached to a stalk and are from 2 to 4 centimeters—⅞ inch to 1⅝ inches—long and from 1 to 3 centimeters—7-16 inch to 1 4-16 inches—wide, of silver gray color, with straight or slightly indented limb.

Special Cells on Branches

The branches of the plant contain in special cells, scattered over the bark and in the wood, mixed with gum and with resinous or balmy elements, an elastic substance, which has properties similar to those of the caoutchouc. In the guayule plant the lactiferous vessels do not exist, and the latex which contains the elastic matter is inclosed in isolated cells, which have no communication between each other.

Owing to this fact, the manner of extracting from the guayule latex is quite different from that employed for the other rubber plants, which latter ones, when cut open in certain spots, allow the milky juice that is then coagulated into elastic rubber to escape as a dripping liquid. For the extraction of the guayule many systems have been proposed, among which that of Bergner seems to answer the purpose better than the others.

According to this process the useful matter is concentrated by mechanical means, which eliminate, so far as possible, all vegetable tissues which do not contain cells rich in latex. For this purpose a ball disintegrator—Krupp system—is used, consisting of a rotating steel drum, which, when put into action, makes the steel balls that it incloses rotate strongly, and these break up and crush the matter put into the drum.

Before the guayule branches are put into the drum they have to be dried until they have lost all their flexibility. The action of the disintegrator tends to separate the woody, brittle, worthless parts from the soft and useful ones, which preserve their soft and sticky consistency even in plants that have otherwise been dried out. In this way, while the

brittle and dry part is changed into powder, the gummy part is gathered in round lumps, which contain a certain amount of crushed wood. These lumps are taken from the disintegrator, where they have become heated through the mechanical action. They are allowed to cool off, and then they are jerked over a fine sieve. The woody mass, in pulverized form, passes through the meshes of this sieve and the useful elements remain still mixed with sawdust, but mechanically concentrated.

This residue is heated and melted through the action of steam in iron kettles; the woody mass settles at the bottom and the upper, molten layer is passed through linen sacks, and thus the juice of the guayule is obtained, from which the elastic rubber is then separated by a special refining process.

Analyzing Guayule

In the collection of original Mexican products, which the department of the interior of the United States of Mexico has recently sent to the commercial museum of Trieste, through the kindness of the consul general of Trieste, Professor Jose Smerdou, there are two large samples of guayule, of which I have analyzed one.

The weight of the samples is almost 1 kilo each or 2.2 pounds, and they have the form of cubic loaves, a little rounded off at the corners. The surface is smooth and of olive yellowish color; it acquires gradually, through contact with the air and from the action of the light, a rather dark hue, between red and brown, and becomes cracked. At the spots of fracture, dry guayule shows up rough and breaks in chips like very stale rye bread. It can be crushed in a mortar, leaving a coarse powder.

I found in my experiments that the composition is not perfectly homogeneous throughout the mass and the following data are the average results arrived at on the dried product. See paragraph 3:

Portion soluble in water	12.70%
Portion soluble in alcohol	34.50%
Proteid matter	.18%
Portion insoluble in water and in alcohol, soluble in carbon bisulphide	42.50%
Mineral substances	5.09%
Other substances not determined, and insoluble residue	5.03%

Almost all of the portion which is soluble in water will settle when alcohol is added and has the appearance of a gummy mass. When the alcoholic liquid is evaporated it leaves a small residue in form of a syrup. The portion soluble in alcohol remains, after the evaporation of the dissolvent, in form of a resinous, glassy, transparent mass, without odor, the acidity of which was 7 per cent. The mineral part contains no chlorides; it does contain traces of potash, much lime and traces of alumine and magnesia. The part which remains insoluble when treated with water and with alcohol appears in the form of a white and very brittle mass, which will melt when boiled in water.

The raw guayule represents an extract of the plant, which, before bringing it into the trade, has been submitted to a purifying process, for which the purpose of eliminating to a large extent the substance soluble in water and the resinous matter. To accomplish this the guayule first is boiled in water, then the part dissolved in the water is separated, and the undissolved mass is stirred with a solution of caustic soda, and a white, milky liquid is obtained, in which the elastic rubber appears spread through the watery part in which the resinous soap is partly dissolved.

When salt or calcium chloride is added to this emulsion, the elastic rubber coagulates and gathers at the surface in a mass that is separated from the watery liquid and is first washed with water and then with solutions containing a little acid. Then it is dried and pressed in forms or molds. The guayule, when thus purified, must still undergo the further processes of purification that are employed for the caoutchouc.

Purified guayule is soluble in all dissolvents that are used for elastic rubber; that is, in ether, in essence of gasoline, in benzol, in carbon bisulphide, and in carbon tetrachloride; it has a slightly aromatic odor and is white in color, with a slight rosy or violet tint. The guayule is not employed at once as it is, but serves more frequently to mix it with the better classes of caoutchouc in the preparation of rubber articles.

Although the guayule represents a variety of caoutchouc that is comparatively little elastic, this product still deserves the most serious consideration, because it freely and perfectly unites with caoutchouc, can be vulcanized and, in distinction from the faktis and other substitutes, resists very well and strongly without undergoing a change.

The information published so far on the guayule is very limited. In Italy and France this product is almost unknown, and only few monographs have been published about it. See paragraph 6.

Much Capital Invested

Attention is due to the economic importance which this product has attained in the course of a few years. Considerable capital has been invested in the guayule industry, and up to this time some fifteen societies have been formed to exploit the cultivation and extract the product. The most important one was founded by the American millionaires, Rockefeller, Morgan, Aldrich, Guggenheim and others, the Continental Rubber Co. of Mexico, with a capital of $30,000,000 American gold.

According to H. C. Pearson, up to the end of 1907 about 2,800,000 kilos—1 kilo equals 2.2 pounds—of guayule have been exported from Mexico as follows:

In the year 1903-4	679,016.8 pounds
In the year 1904-5	1,095,686.2 pounds
In the year 1905-6	3,196,670.0 pounds

The rest, in the year 1907, or rather in the first part of the fiscal year, 1906-7.

The price of guayule fluctuated a little at first, either because it was not possible to employ it in all industries with success from the beginning, which produced distrust for a while, or else because the market conditions were not always favorable.

Towards the end of 1906 guayule acquired a position in the markets of New York and Hamburg; at that time it was quoted at 76 to 84 cents; at the end of 1907 the price ranged from $1.32 to $1.38 per pound.

With the perfection of the means of extracting and purifying, guayule continues to come nearer the price of elastic rubber of good quality, and there is no doubt that this product will have a great future.

Author's Notes

1—The scientific literature of Italy is without a work that treats in detail on this topic. The most important work of general scientific literature is that of Professor Alexander Tschirch in Berne, who studied the matter of elastic rubber in conjunction with his students and published the results in his masterly work: Die Harze und die Harzbehälter, mit Einschluss der Milchsäfte. Leipzig, 1906. 1260 pages. Useful works to consult on the matter: Wiesner, Die Rohstoffe, etc.; F. V. Hohel, Gewinnung des Kautschuk; Tschirch, Indische Heil-und Nutzpflanzen; Heriquez, Der Kautschuk und Seine Quellen; Markwart und Frank, Ueber Herkommen und chemisches Kautschuk.

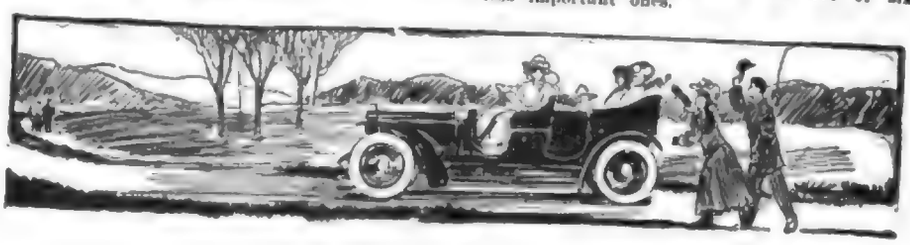
2—Sonchus oleraceus, L., is extolled by Kassner in the monograph, "Ist in Deutschland eine Produktion von Kautschuk möglich, gestützt auf Anbau einheimischer Kulturpflanzen?" Breslau, 1885

3—On the etymology of the name opinions differ. Very probable is the derivation from Spanish hay, there is, and ule, Indian for elastic rubber. According to others from quach, Indian for wood, log, stalk and ule, that is, wood caoutchouc. The plant has different names in the current Mexican language: ibahude, jiquihite, bopalin, mariola, hierba del negro. It should, however, be noted, that in common parlance the same expressions are used to designate many other plants, aside of the *parthenium argentatum*.

4—The analytical data about the guayule that are found in the literature all originate from Endlich and are transcribed by Tschirch, in the work mentioned above. The author found in the mercantile product the following averages: Caoutchouc, 33.8 per cent to 57.28 per cent; rosin, 29.2 per cent to 19.35 per cent.

5—The guayule literature is limited to a few monographs: Dr. Rudolf Endlich, Der Guayule und seine wirtschaftliche Bedeutung in "Tropenpflanzen," May, 1905. Same author: Ueber den gegenwärtigen Stand und die Aussichten der Guayuleindustrie in "Tropenpflanzen," July, 1907. Guayule in "Journal d' Agriculture Tropicale," Paris, 1907. Interesting notices on the matter have come to the Commercial Museum through a report from Mr. Carlos Lurie in Torreón.

6—The most important societies for the exploitation of guayule, aside of those mentioned, are Compañía Explotadora Coahuilense; Coahuila Mining & Smelting Company; National Rubber Company, Torreón; Compañía Guayulera, S. A., Torreón, and five or six less important ones.



Ministerio de Obras Públicas y Comunicaciones

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Development Briefs

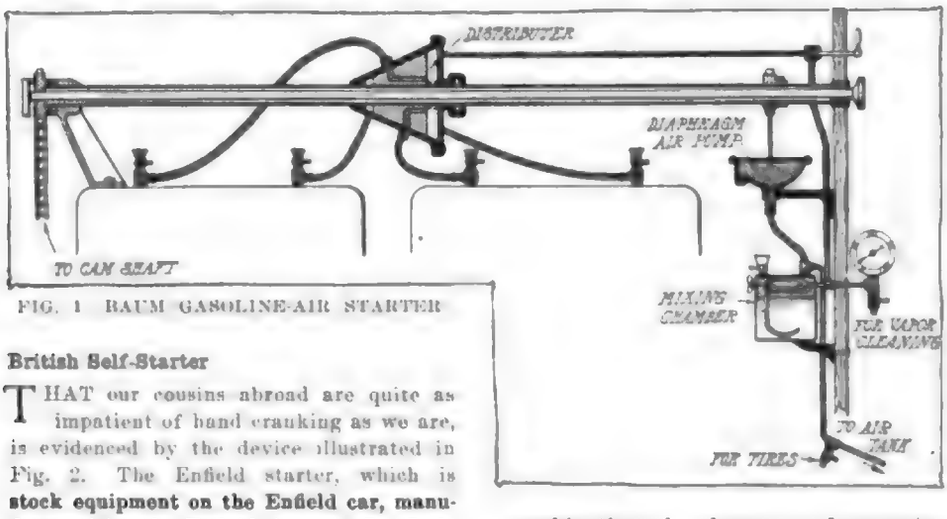


FIG. 1 BAUM GASOLINE-AIR STARTER

British Self-Starter

THAT our cousins abroad are quite as impatient of hand cranking as we are, is evidenced by the device illustrated in Fig. 2. The Enfield starter, which is stock equipment on the Enfield car, manufactured by the Enfield Autocar Co., Ltd., Sparkbrook, Birmingham, England, is of the rack-and-pinion type, the operating medium being compressed air. The starter is applied to the rear of the motor, the pinion being a member of the clutch assembly. The device consists of a cylinder, which extends across the entire width of the frame; the piston is substantially a cylinder within a cylinder, having itself, a small stationary piston, which is hollow and connected with a compressed-air pipe. This pipe leads to a slide valve, which controls the admission of air to the main cylinder. The rack is a part of the piston, and when not in use in the act of cranking the motor, is out of engagement with the pinion.

In action, air is admitted to the valve chamber by a master valve controlled by a lever on the dash or steering column. It is thence conducted to the main cylinder and forces the piston to the opposite end of the cylinder, at which point it moves the slide valve to register with the auxiliary line, which leads the air through the hollow auxiliary piston to the interior chamber of the piston, forcing it to its original position, with the rack free of the pinion. The pinion is of course mounted to the clutch shaft by means of a ratchet and pawl. The air necessary for the operation of the device is compressed by a small compressor mounted on the front of the motor, and is stored in a tank. An automatic governor keeps the pressure in the tank uniform.

Desco Combination Generator

Combining the functions of both electric lighting and ignition, the latest improvement of the generator manufactured by the Detroit Electric Appliance Co., of Detroit, Mich., which was described in the issue of Motor Age of February 1, 1912, offers in one compact machine, Fig. 4, an efficient lighting dynamo and a high-tension magneto. This generator, which is a combination of a dynamo and magneto, possesses the advantage of a constant current regulator, which makes the output of the generator uniform, even in case of a dead short circuit. This makes burning out impossible, and the machine will generate 6 volts at any speed above 500 revolutions per minute, and will never exceed the amount for which it is adjusted. Another feature of value is the absence of a direct ground, making the two systems independent, so that a short-circuit on one will have no effect on the other.

In brief, the generator consists of what is substantially a magneto, having permanent horseshoe magnets as pole-pieces, upon which are auxiliary field windings, which permit of constant current. This feature is controlled by an automatic regulator which consists of a pair of electromagnets wired in series with the generator circuit, exerting a pull proportionate to the intensity of the current upon two spring-mounted armatures. This regulator is so connected as to shunt the field magnets across the line at low speeds, cutting them off at medium speeds, and reversing their terminals with final introduction of resistance at high speeds. The low-tension primary current is generated on the terminals, and induction takes place in the coil, the housing of which is fitted with a high-tension interrupter with platinum points, to which a condenser is connected to care for any spark there. A safety spark plug is located on top of the coil housing to prevent injury in case of a break in the high-tension circuit. The high-tension wires are connected direct from the distributor to the plugs. The lighting feature remains the same as with the regular lighting generator. A three-point switch, with a push button starter, is used with the new system, with either one or two sets of batteries.

American Steel Tire

Steel is the structural feature of the casing to be marketed by the American Steel Tire Co., of Milwaukee, Wis. The tire is pneumatic, differing from the ordinary type in that the tread is detachable, and the chief material entering into its construction is steel bands. As may be seen in the sketch, Fig. 3, the tire is designed to be used in connection with a regular inner tube in the usual manner, and to fit any standard rim. The casing is built on a bead composed of flexible but inextensible steel cables, upon which steel bands are placed as shown in the sketch, in two layers, free to flex and slide,

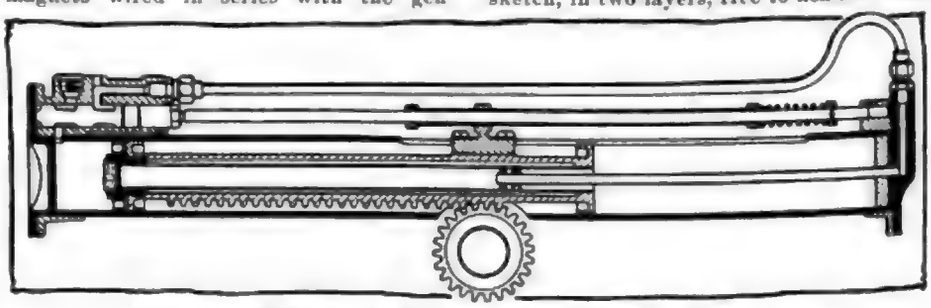


FIG. 2—FEATURES OF ENFIELD COMPRESSED AIR STARTER

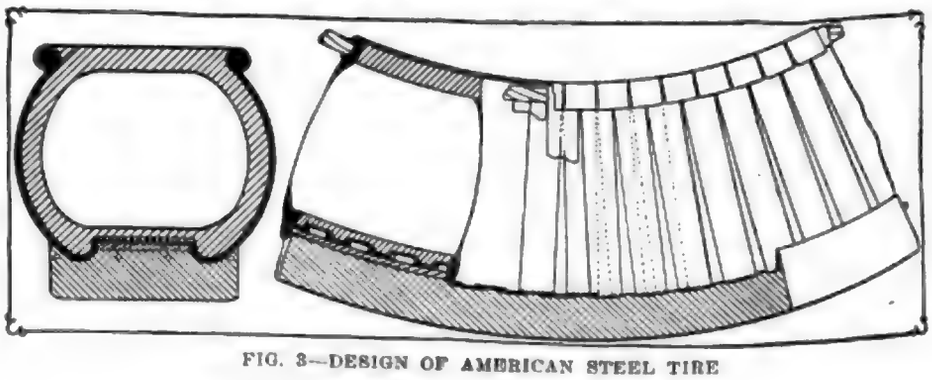


FIG. 3—DESIGN OF AMERICAN STEEL TIRE

Brief Business Announcements

Recent Agencies Appointed by Car and Truck Manufacturers

PLEASURE CARS

Town	Agent	Car
Ada, O.	J. H. Jones	King
Atlanta, Ga.	Jack O'Dell	Packard
Binghamton, N. Y.	H. T. Rogers	Alco
Calgary, Alb., Can.	Geddes & Sheffield	Alco
Des Moines, Ia.	Cartercar Iowa Co.	Empire
Edmonton, Alb., Can.	Taylor & Muesson	Alco
Galveston, Tex.	R. S. Carter	Correja
Joliet, Ill.	J. A. Howlson	Michigan
Memphis, Tenn.	Six Thirty-Eight Tire & Vulcanizing Co.	Alco
Milwaukee, Wis.	George W. Browne	Stutz
Milwaukee, Wis.	R. A. Creek	Empire
Middletown, O.	Middletown Motor Car Co.	King
Morris, Ill.	D. S. Huff	Franklin
Mt. Vernon, Ill.	H. A. Sanders	Franklin
Norwich, Conn.	F. O. Cunningham	Franklin
Owens, O.	J. D. Owens	King
Peekskill, N. Y.	W. H. Ash	Alco
Rochelle, Ill.	George E. Stocking	Alco
Spokane, Wash.	Metropolitan Motor Car Co.	Lozier
Tacoma, Wash.	Pacific Car Co.	Hudson
York, Pa.	York Garage & Supply Co.	R-C-H

TRUCKS

Town	Agent	Car
Boston, Mass.	W. L. Russell & Co.	Veerac
Milwaukee, Wis.	Skuol & Schauer	G-M-C
San Francisco, Cal.	A. E. Hunter Motor Car Co.	Lippard-Stewart

CHEHALIS, Wash.—The Chehalis Garage Co. is completing a fine two-story garage building.

Rochester, N. Y.—The Buick Motor Sales Co. has not removed from 591 East Main street, as reported recently.

St. Paul, Minn.—The Auto Tire Sales Co., 151 West Sixth street, St. Paul, has begun to make over its building to get additional space. A. P. Jungck is manager.

Boston, Mass.—W. K. Hadley, until recently with the Marion Motor Car Co. at Indianapolis, is now general sales manager and purchasing agent for the Lenox Motor Car Co., of Boston.

Seattle, Wash.—George E. Johnson, formerly identified with Mitchell cars in Seattle, will handle the American, Marion and Paige-Detroit in one agency. Temporary quarters are at 312 East Pike street.

St. Louis, Mo.—The United States Tire Co.'s St. Louis branch will move to the northeast corner of Compton avenue and Locust street. This is directly across from the new building of the Firestone Tire and Rubber Co. Two accessory houses are on the other corners. This is part of the new row of St. Louis.

St. Paul, Minn.—The White Bear Auto Co. has absorbed the St. Paul agency for the R. C. H. and will have sale of the cars in Ramsey, Dakota, Washington and Chisago counties. The salesroom will be in the new garage of the company at 161-163 West Sixth street, St. Paul, into which the company has just moved.

St. Louis, Mo.—The Wesco Supply Co., manufacturer and jobber of electrical supplies, has recently taken up the handling of motor accessories at wholesale. It has warehouses in Fort Worth, Tex., and Birmingham, Ala., in addition to its large building at Seventh street and Clark avenue, St. Louis, and has twenty-five salesmen on the road. The accessories department has been placed in charge of A. E. Rosenberg.

Atlanta, Ga.—M. Neighbors and R. M. Northcutt have taken the retail sales of the Cole, Alco and Federal truck.

Los Angeles, Cal.—The new Packard home at Tenth and Hope streets, Los Angeles, was occupied during the past week by Earle Anthony and his force of salesmen.

Detroit, Mich.—The Michigan State Automobile School, of which A. G. Zeller is secretary and treasurer, has just been incorporated for $10,000. The school is one of the oldest in the state.

Chicago—Paul Kollmorgen, formerly with the local Stevens-Duryea branch, has been appointed sales manager of the National Motor Car Co., of Illinois, Chicago National agent, of which E. C. Divine is manager.

Indianapolis, Ind.—Gasoline motor cars for use on railways will be manufactured by the newly organized Railway Motor Car Co., of Marion, Ind. The concern has been incorporated with an authorized capitalization of $200,000 by G. R. Stewart, J. D. Worth, Eben H. Wolcott, Hiram Beshore and W. O. Worth.

St. Louis, Mo.—The Chicopee Motor Car Co., handling the Cutting and Stevens-Duryea in St. Louis, has consolidated with the Superior Motor Sales Co., handling the Stoddard-Dayton. The combined concern will be known as the Superior Motor Sales Co. and will carry all three makes handled by the two firms.

Columbus, O.—The Everitt Auto Sales Co., which was incorporated recently with an authorized capital of $30,000, will establish a wholesale agency for the Everitt line in a new building at 307 and 309 Mt. Vernon avenue. The retail business in the Everitt line is handled by the Cummins Auto Co. on North Fourth street. Two of the incorporators are Horace K. Dodson and Amos F. White, who formerly were travelers for the Twyman Motor Car Co., of Columbus.

Winnipeg, Can.—The Ford Motor Co. expects to occupy its new service garage on Water street during the latter part of July.

Winnipeg, Can.—The Larimer Electric Co., agent for the Detroit electric, will take over the new garage erected by the Free Press of this city next to its new offices and expects to be in possession early in the fall.

Winnipeg, Can.—Joseph Maw & Co., Ltd., have taken the agency for the Chalmers. They also have closed a contract for the Argo electric and will handle this line from the commercial truck side. Arrangements are being made for the installation of a complete charging plant.

Indianapolis, Ind.—Within a few days the Archey-Atkins Co. will move into a new salesroom at Capitol avenue and Michigan street, in Indianapolis. The Globe Realty Co. completed a three-story reinforced concrete building for the use of the company, which has the agency for the Hudson, Pierce-Arrow and Detroit electric.

San Francisco, Cal.—The R. C. H. Corporation, through its western sales manager, A. E. Morrison, has opened a branch and service station at San Francisco. The building secured for this purpose is a three-story structure on Ellis avenue just off Van Ness. The floor space of 18,000 square feet is available for display and parts storage. The San Francisco branch will be used as a car and replacement distributing point for the entire west and a sufficient supply of cars will be kept on hand to take care of rush orders at all times. The opening of the new Pacific coast station increases the number of factory branches to fourteen, the others being situated at Detroit, Chicago, New York, Boston, Philadelphia, Atlanta, Buf-

falo, Cleveland, Kansas City, Minneapolis, Denver, Los Angeles and Walkerville, Canada.

Indianapolis, Ind.—Arthur H. Berndt will become assistant manager of the Indianapolis sales branch of the Remy Electric Co. on September 1.

Spokane, Wash.—G. B. Clement has resigned as manager of the Spokane branch of the Goodyear Tire and Rubber Co. and will go to San Francisco to engage in the motor car business.

Detroit, Mich.—M. A. Weissenburger, who for the past year and a half has been traveling in the New England states and the territory adjacent to New York city, has been transferred by the Regal Motor Car Co. to the Pacific coast.

Minneapolis, Minn.—Harry C. Kemp and Matt. C. Kemp have bought from W. D. Rightmire the tire repair station at 1629 Hennepin avenue and will change the name from the Minneapolis Auto Tire Repair Station to the Minneapolis Tire Repair Co.

Columbus, O.—The Twyman Motor Car Co., of Columbus, wholesalers for the E-M-F and Flanders over a large territory in Ohio, West Virginia and Indiana, have taken on O. W. Lawson, agent for the Studebaker at San Antonio, who will travel for the Columbus concern.

Winnipeg, Can.—The Tudhope-Anderson Co. will take over its new garage on Water street this month and will have a complete service plant for the benefit of Tudhope car owners. This is the same car as the American Everitt, but sold under the Tudhope name in Canada.

Detroit, Mich.—The Scheidel-Thompson Mfg. Co., incorporated under the laws of the state of Michigan with an authorized capitalization of $5,000, has been certified to do business in Indiana. A factory has recently been established by the company in Indianapolis for the manufacture of sheet metal parts for motor cars. All of the company's capital stock is represented in Indiana.

Los Angeles, Cal.—F. O. Nelson has resigned as manager of the Diamond Rubber Co.'s Los Angeles branch and will shortly enter business for himself.

St. Louis, Mo.—The Missouri Motor Car Co. has moved into its new building at 3005-07 Locust street. The concern handles the Amplex, Alco, Abbott-Detroit and Marmon.

Detroit, Mich.—The Keeton Motor Co. has added to its office force H. D. W. MacKaye as assistant to the president. He also will take charge of the purchasing.

Minneapolis, Minn.—The Ford Motor Co. has completed a purchase of a trackage site in Minneapolis for its assembling and distributing plant for northwestern territory service, at a cost of $51,500.

Atlanta, Ga.—Work has started on the new building for the Oakland southern branch. The building will be located at the corner of Peachtree and Linden streets.

Dallas, Texas—C. W. Hartman, manager for the Studebaker in Texas, with headquarters in Dallas, announces the opening of a branch house in San Antonio. This is done with a view of handling the south Texas trade.

Cleveland, O.—The Motz Tire and Rubber Co. has opened a direct factory branch here at 2352 Euclid avenue, in charge of Charles Serfass. The company also has opened a branch in Philadelphia, at 1409 Race street, in charge of William M. Stubbs.

Milwaukee, Wis.—The Layton Park Oil and Soap Co. has been organized at Milwaukee by Leo Hofmeister, president and chief owner of the Leo Hofmeister Co., wholesale motor oils and greases, Forest Home and Hofmeister avenues, Milwaukee. The concern is capitalized at $50,000 and Leo Hofmeister, W. O. Meilahn and E. A. Baker are the incorporators.

Portland, Ore.—The Braly-Du Bois Auto Co., of Portland, has just added the Ohio electric to its line of cars. The agency formerly was held by the Rose City garage, of Portland.

Milwaukee, Wis.—Hugo C. Boorse, 2522 Grand avenue, has taken a large financial interest in the Schreiber Motor Car Co., 180 Fifth street, state agent for the Locomobile, Haynes and Hudson. The name of the company has been changed to the Schreiber-Boorse Motor Car Co.

Des Moines, Ia.—The Iowa Auto and Supply Co. has taken local and district agency for the Chalmers car. The Ryan Motors Co. has had this agency for several years, having succeeded the Iowa Auto and Supply Co. in the handling of the car when it was known as Chalmers-Detroit.

Madison, Wis.—The Fisk Rubber Co., of New York, has filed articles and a statement to do business in Wisconsin. The capital stock is given as $50,000 and the local interest at $5,000. The Wisconsin branch is located at 456 Milwaukee street, Milwaukee, and Frank M. Lee is manager.

Detroit, Mich.—Walter J. Bemb, central district sales manager, and L. J. Robinson, southern district sales manager for the Hudson Motor Car Co., having resigned from the Hudson company, have established the Bemb-Robinson Co. as distributor for the Hudson line in the vicinity of Detroit.

Boston, Mass.—C. E. Wheeler, formerly connected with the Franklin branch in Boston, has been made manager of the R. C. H. Corporation branch in that city, filling the vacancy caused by the transfer to the Pacific coast of William Jordan, who has been manager of the Hub branch for several months.

Recent Incorporations

Boston, Mass.—Marion Motor Car Co., capital stock, $5,000; incorporators, A. R. Atwater, A. L. Dinnin, R. W. Campbell, A. W. Campbell.

Brooklyn, N. Y.—Dunham Auto Co., capital stock, $15,000; incorporators, F. Dunham, L. Carmadelle, C. A. Apfel.

Buffalo, N. Y.—L. G. Schoepflin Co., capital stock, $10,000; motor car business; incorporators, L. G. Schoepflin, L. O. Schoepflin, H. G. Schoepflin.

Cincinnati, O.—Hanauer Automobile Co., capital stock, $20,000.

Cincinnati, O.—Commercial Motor Sales Co., capital stock, $10,000; to deal in trucks and pleasure cars; incorporators, W. G. Vosper, G. Schorr, E. H. Hoelscher.

Clarksdale, Miss.—Essenkay Sales Co., capital stock, $5,000; to manufacture tire filler; incorporators, J. L. Hartsborn, J. W. Primrose, L. L. Ledbetter.

Corinth, Miss.—Corinth Auto Co., capital stock, $10,000; general motor car business, incorporators, W. A. Stewart, W. A. Hinton, C. F. Hinton, H. N. Young.

Detroit, Mich.—Capital Auto Lock Co., capital stock, $10,000, to manufacture motor car locks; incorporators, B. Noble, A. E. Schreiber, W. W. Martin.

Dothan, Ala.—Alabama Airless Tire Co., capital stock, $5,000.

Flatonia, Tex.—Flatonia Automobile Co., capital stock, $5,000; incorporators, E. A. Arden, Donald McKay, C. P. Johnson.

Indianapolis, Ind.—Martin Tractor Co., capital stock, $150,000, to manufacture trucks; incorporators, H. R. Richards, F. B. Davenport, E. D. Moon, G. D. Thornton, C. H. Martin.

Jersey City, N. J.—Republic Auto Tire Vulcanizing Co., capital stock $25,000, to manufacture motor cars and accessories, incorporators, W. Merkel, P. W. Stinard, M. Levine.

Nashville, Tenn.—Seaton Wheel Co., capital stock, $130,000, incorporators, G. Jackson, S. S. Lord, B. C. Seaton.

New York—Russian Tyre Sales Co., capital stock, $20,000, to deal in tires, etc.; incorporators, O. Braunwarth, H. Ray Edge, M. Steinway.

New York—American Motor Freight Co., capital stock, $25,000, freight transportation; incorporators, H. G. Waring, H. W. Bell, H. G. Phillips.

New York—Canadian Overman Co., capital stock, $50,000; to manufacture tires, incorporators, W. A. Pease, Jr., A. Z. Gray, L. Willmerding.

New York—East End Garage, Inc., capital stock, $1,000; incorporators, Henry Krauss, F. Krauss, M. Steindler.

New York—Standard Auto Coach Burial Co., capital stock, $200,000, incorporators, J. Newberger, F. C. Cochren, S. S. Lowenstein, W. Litzinberger, C. H. Tebbetts.

Philadelphia, Pa.—Auto Signal Mfg. Co., capital stock, $100,000.

Philadelphia, Pa.—Auto Development Co., capital stock, $100,000; to apply for and obtain patent rights to manufacture motor cars.

Portland, Me.—Essenkay Sales Co., capital stock, $50,000, to manufacture and sell motor cars and supplies; incorporators, D. J. Snow, H. P. Swentzer.

Portland, Me.—Universal Motor Truck Co., capital stock, $10,000; incorporators, C. E. Eaton, T. L. Crotean, J. E. Manter.

Syracuse, N. Y.—Jefferson Garage Co., capital stock, $20,000; incorporators, A. Matzene, C. J. Roehm, C. J. Baumer.

Toledo, O.—Toledo Motor Truck Co., capital stock, $95,000.

Toledo, O.—Rapp Mfg. Co., capital stock, $15,000; to manufacture spark plugs, gasoline engines and accessories; incorporators, S. W. Rapp, C. D. Stone, S. L. Thorburn, O. L. Hankinson, C. D. Few.

Toledo, O.—Walker Tire Chain Co., capital stock, $150,000, to manufacture tire chains and accessories; incorporators, H. F. Rohrman, C. A. Newman, C. P. Eger, A. M. Edwards, G. C. Bryce.

Toronto, O.—Toronto Rubber Co., capital stock $100,000; to deal in tires and rubber products, incorporators, T. Price, C. H. Smith, W. B. Stratton, E. E. Erskine, L. O'Neal.

West Falls, N. Y.—Golden & Buffalo Auto Service Co., capital stock, $2,000, incorporators, F. Hey, S. Hey, C. Leupold.

Legal Lights and Side Lights

ARIZONA'S NEW LAW

A LAW providing for the registration of motor cars and chauffeurs, and regulating the operation of motor vehicles on public highways, has been passed by the first Arizona state legislature. While it is unusual in many respects and drastic in some, it will relieve chaotic conditions that now prevail throughout Arizona and will augment the state road fund.

This law goes into effect early in September. Before that time the owner of each individual motor vehicle in the state must register with the secretary of state, on a blank provided for that purpose, his name and address, the name of the machine, name of the maker, factory number, style of vehicle and motor power. The filing fee is $5 and the secretary shall furnish free of charge an aluminum seal not less than 2 inches in diameter.

After buying a car a purchaser is given 5 days to register the machine, but in the meantime it must bear the seal supplied the dealer or other former owner. In case a car has once been registered separately, a second registration costs only $3. The seller is given 10 days to return his seal to the secretary. One section of the law forbids the use of a seal on more than one vehicle, or the use of fictitious numbers and seals.

A chauffeur is defined as "any person operating a motor vehicle as mechanic or employe or for hire." The chauffeurs are given 30 days after the law goes into effect to register with the secretary of state. The registration fee for a chauffeur is also $5.

Non-residents are not required to comply with the registration law, provided they have complied with the laws of their own states, until they have been in Arizona 6 months.

"Closely built up territory," mentioned frequently in the law, includes the business section of any incorporated town and streets or roads where the houses are not more than 100 feet apart for a distance of not less than a quarter of a mile. Motorists are forbidden, under any circumstances, to drive at a speed greater than is "reasonable and proper," with regard to the traffic. The limit for "closely built up territory" is a mile in 6 minutes, and elsewhere in incorporated cities and towns a mile in 4 minutes. Outside municipal corporate limits the maximum speed allowed is a mile in 2 minutes, except on stretches set aside by local authorities for testing purposes. Local authorities are given power to prescribe lesser rates of speed and to enact any legislation not conflicting with the state law. All such legislation must be adopted in the future, however, for all municipal ordinances relating to motor traffic are repealed by this act. Local officers are required to have signs placed where speed changes are to be made.

To violate any provision of the law will constitute a misdemeanor. The first offense is punishable by a fine of anything up to $100 or 30 days' imprisonment, or both such fine and imprisonment; the second, $50 to $100, or 30 days, or both; third and subsequent, $100 to $250, 30 days or both.

MILWAUKEE'S LIGHT LAW IN FORCE

The new Milwaukee ordinance requiring all vehicles to carry lights at night went into effect on July 3, and the chief of police has issued a warning to all owners of horse-drawn vehicles that the law will be enforced rigidly. The ordinance as adopted by the common council is much better than was expected by the Milwaukee Automobile Club, which initiated the legislation and wrote the ordinance. The text is as follows:

Section 1—Every vehicle on wheels, whether stationary or in motion, on any public street, highway or bridge within the corporate limits of the city of Milwaukee, shall have attached to it a lamp or lamps which shall be kept lighted during the period from 1 hour after sunset to 1 hour before sunrise and shall be so displayed as to be visible from the rear and front of such vehicle during said period from 1 hour after sunset to 1 hour before sunrise; provided, however, that this act shall not apply to any vehicle which is designed to be propelled by hand, or to any vehicle designed for the transportation, as its principal freight, of hay or straw, while loaded with such freight.

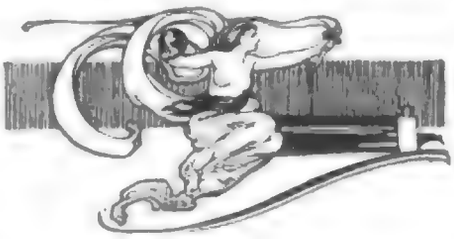
Section 2—Any person, firm or corporation violating the provisions of this ordinance shall be punished by a fine of not less than $5 nor more than $25 for each offense, and in default of payment by imprisonment in the county jail for not less than 10 days.

Section 3—This ordinance shall take effect and be in force from and after its passage and publication.

The Milwaukee Automobile Club's legislative department considers the ordinance to be a model one, which it is expected that clubs in other cities of the country will propose for adoption. The club, acting with the Wisconsin State A. A., will attempt to make it a state law at the next legislative session.

CHAUFFEURS MUST PAY

The Illinois supreme court held constitutional the recent motor act, which requires chauffeurs to be licensed. The case was appealed from the municipal court of Cook county by E. Earl Sargent, who was fined for operating a car for hire without a state license.



PITTSBURGH LEGISLATING

The ordinance regulating the time during which cars may stand in the downtown streets in Pittsburgh, Pa., and specifying certain places where motor cars may be parked has been referred by the councilmanic committee on public safety to a sub-committee. E. J. Kent, counsel for the Automobile Club of Pittsburgh, contended that the ordinance was too drastic, that cars ought to be allowed to stand an hour in the streets, whether or not a chauffeur be in charge. The bill stipulates that a car with a chauffeur may stand 30 minutes in the street, one with a chauffeur 15 minutes.

Under the law municipalities may not pass ordinances regulating the speed of the cars, but by posting signs wherever it pleases it may compel drivers to run not more than 12 miles an hour and as much slower as due care may require. The territory included under the new law is practically all the downtown streets, all the main thoroughfare of the city on which car tracks are located and on which there are business houses, wholesale or retail, or which are thickly built up or populated.

NOVEL POINT RAISED

Suit has been brought in the superior court at Norwalk, Conn., by the Armory Auto Co. of Norwalk against Charles Buck, Jr., also of the same town, for $5,000 damages on a novel point of law that will interest motor dealers and garage men. The company in its bill of complaint against the defendant alleges that in April, 1911, it owned the Norwalk Consolidated Auto Co., and that the defendant represented himself as being a person who knew the motor car business and he applied for the position as manager of the company. He was hired on the strength of his statements, the plaintiff alleges, and that as a result of his mismanagement the corporation was forced out of business.

ODD CASE ON COAST

A test case of interest and importance to garage owners and motorists alike is now being argued in Los Angeles county superior court. An owner went into a Los Angeles garage and, according to the garage man, the owner asked him to put 5 gallons of gasoline into the tank, and, according to the owner, he asked the garage man to fill the tank. It developed that the gasoline overflowed, caught fire and burned the car up. The question now is whether a garage man is to know how much gasoline a tank will hold or know how much gasoline is in the tank at the time of filling. The decision is pending.

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MOTOR AGE

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Contents

DEPARTMENTS

You Can Avoid All Tire Troubles

Anybody can doubt

ZiLiO

You find out

Rides like air: Ends tire care

YOU owe it to yourself to investigate ZiLiO. If ZiLiO puts an end to punctures and blowouts—to all tire troubles—you certainly should know about it. If ZiLiO doubles the mileage of casings and does away with inner tubes, it means a saving you ought to take advantage of. If ZiLiO can cut your tire repair expense down to nothing, you want ZiLiO.

ZiLiO does all these things. Wherever you may be, you can prove it to yourself with your own car. Remember ZiLiO is guaranteed for two years. Get our trial offer with money-back guarantee.

¶ ZiLiO comes in logs, as shown in cut. No inner tubes are used. You can install ZiLiO yourself, it is so simple. ZiLiO is a vegetable compound. It contains no rubber and is much more resilient than rubber. ZiLiO can be used until the casing is worn down to the fabric. Then it can be readily transferred to another casing.

¶ Send now for *your* free sample of ZiLiO so you can see just what this reddish brown, plum-pudding-like, money saver looks like. Simply say, "Send ZiLiO sample and trial offer with money-back guarantee."

Placing ZiLiO in Casing

"I am free from tire troubles"

"As far as I can see, the riding qualities of my car are in every respect equal to what they were when I used air. The fact that I know that I am free from tire troubles gives a feeling of relief that can hardly be expressed in words.

"I can also see that the saving in the life of my casings will in a short time more than pay for the ZiLiO."

"Nothing could induce me to return to air."

"I am now free, not only from the actual annoyance and troubles of fixing punctured tires, but from the fear, worry and anxiety that something may happen to my tires before I get back; and the beauty of it is that this elimination of trouble and anxiety really costs me nothing, because I am more than reimbursed for what I paid for ZiLiO in prolonged life of my casings and in not being required to buy inner tubes nor to carry extra casings."

Letters on file in our office. Names on request.

WILL YOU BE THE MAN TO SECURE THE MONEY-MAKING ZiLiO AGENCY IN YOUR LOCALITY? GET OUR PROPOSITION NOW.

Every car owner in your territory is waiting for the opportunity to give ZiLiO a chance to make good. Every day brings us inquiries from all over the United States. If you could see the cars lined up in Chicago waiting to have their tires filled you would realize what a wide-open opportunity ZiLiO offers you. From some of the most distant points in America men are coming to Chicago merely to satisfy themselves that ZiLiO is as good as we claim it is. If you could see all these things it would help you realize the unlimited opportunity ZiLiO offers you. We need men to act as distributing agents for ZiLiO. A little capital is required. It will vary, according to locality. Only enough is needed to put in a small stock of ZiLiO and to get things started. No money is to be invested in the ZiLiO Sales Co., the shares of which are *not* for sale.

If in your whole territory you fill the tires of but one car a day, it means a *net* profit to you of $6,000 a year. This will give you some idea of the possibilities. You can devote your best efforts to building up a *permanent* business. We will turn over to you all the prospects we have secured in your territory, which will give you some business to *close right away*.

This demands quick action. Better telegraph us at once to find out if the territory you want is still open, and then hold yourself in readiness to come to Chicago to close the deal. Write or wire us at once if you mean business.

ZiLiO SALES COMPANY, 3261 So. Park Avenue, CHICAGO

Mt. Ararat, Turkey
Photo: Ministry of Tourism, Turkey

(continued from page 11)

Skirting the shore of Traverse bay, the following day or reveling among the innumerable lakes that dot this section the motorist cannot fail to become enthusiastic over this northern country. Scarcely too much can be said of the enjoyments afforded by a trip along the western shore of the Wolverine state. This land of fruits and flowers, lakes and woods, hills and valleys, hunting and fishing, with its air as refreshing as that of the mountains or the sea, once known to the motorist is certain to be sought again and again.

Charms of Charlevoix

Charlevoix, surrounded by water, its confines being Lake Michigan, Pine and Round lakes, has many charms. And in all this northern country is immunity from hay fever. And at the end of this day's journey is Petoskey, like Algeria, spread over the hillsides facing the sea, while nearby Bay View with its summer Chautauqua, Wequetonsing, Roaring Brook, and many another quaintly named, alluring spot, and stretching far toward the sunset, Harbor Point lapped or lashed by the blue waters of Lake Michigan. The next day can be well spent on the attractive drives hereabouts, or a run to Mackinac may be made.

On the return trip, if one is fortunate to be in Mackinac or Petoskey on the right day, which may be 1, 2 or 3 days in the week, it is possible to make ferry connections with Ephriam or Green Bay, and the run into Chicago on the Wisconsin side of the lake can be accomplished very easily in a couple of days. If it is not desired to cross to the western shore, but instead to return through Michigan, the route may be retraced to Traverse City and from there either by the more direct route via Cadillac and Grand Rapids, or, again passing through Manistee, Ludington and on down the shore.

The Peninsular Commonwealth

Michigan with its 5,000 lakes scarcely could be other than delightful touring ground, but until one has seen the sunset glories trailing o'er the broad waters of its namesake, breathed its vitalizing air, tested the richness of its fruits and the hospitality of its people they know not the peninsular commonwealth.

Though barely sketching an outline, the extensiveness of these routes through six states leaves small space for details of points of interest all along the way. These are but hints and suggestions for many a delightful day's travel, and when once enjoyed to their repleteness, to say they will be repeated is but trite. For general routings and mileages acknowledgement is made to the courtesy of the Official Automobile Blue Book, which motorists will find of value on tours.

Atlas Engine Works Put on the Market

Judge Weir Authorizes Receiver Gardner to Sell Property July 29—Protest by H. H. Hanna, Sr., Principal Stockholder, of No Avail—Prospective Purchaser Reported

INDIANAPOLIS, Ind., July 15—Judge Clarence E. Weir of the superior court has authorized Fred C. Gardner, receiver for the Atlas Engine Works, to sell the company's property and has fixed July 29 as the date of sale. The only bidder in sight at this time is a motor car concern in Detroit, the name of which is being withheld.

The date of sale was fixed over the protest of Hugh H. Hanna, Sr., president of the company, who owns all of the common stock, some of the preferred stock, and who also is indorser on $1,100,000 in notes of the company given 5 years ago, when a creditors' committee took charge of the plant. Mr. Hanna, through his attorneys, contended the sale should not take place for at least 60 days, in order to permit proper advertising in trade journals and to enable him to have an opportunity to undertake to finance a bid on the property himself.

Attorneys for the receiver, however, opposed Mr. Hanna's suggestion. They contended if the sale were delayed or not made to the prospective purchaser in sight, the bond holders would not receive 50 cents on the dollar and other creditors of the company would lose everything.

In the proposed terms of sale, which have been agreed to by the receiver and the prospective purchaser, the common stock, preferred stock and the $1,100,000 notes indorsed by Mr. Hanna will be eliminated and nothing paid on them. The stocks and securities of the company have not been listed for several years, but a manual issued in 1906 states that the authorized common stock was $1,000,000, with $750,000 issued, and the preferred stock, bearing 6 per cent interest, $1,000,000, all of which was issued. The undivided profits in 1904 were $60,969.95, and in 1905 the undivided profits were $66,343.44.

The prospective purchaser proposes to assume a mortgage against the property securing bonds amounting to $1,050,000, to pay $105,000 indebtedness incurred in a bond issue of $150,000 and turn over enough cash to the receiver to pay all mercantile accounts contracted since a creditors' committee took charge, as well as the salary rolls and receivership expenses, amounting to about $80,000, which has been fixed as the upset price. The purchaser is to cancel the bonds.

The Atlas Engine Works began business in 1872 and for many years was the largest manufacturer of steam boilers in the United States. The manufacture of these was discontinued some years ago. More recently the company has built motor car engines, Deisel crude-oil engines, and has the American trade rights to manufacture the Silent Knight motors.

It is said the proposed purchaser, if it gets the property, may not continue the manufacture of the Silent Knight motors or the crude-oil engines, but will make a line of four-cylinder cars selling at from $1,200 to $1,500. There is no intention of disturbing the prospective purchaser's plant in Detroit. About 5,000 men would be given employment and several thousand cars would be built annually.

WILLYS' GARFORD PLANS

Toledo, O., July 15—President John N. Willys, of the Willys-Overland Co., since his purchase of the Garford company at Elyria, O., recently, has had complete charge of the Garford plant, though only in the capacity of general manager, until August 1, after which a reorganization will take place, when Mr. Garford and his officers will retire, giving way to President Willys and a new set of officials. The capital of the Garford company is $2,000,000, of which $1,500,000 is common, this latter amount representing Mr. Willys' purchase. The old selling arrangement between the Willys-Garford Sales Co., and the Garford Co., does not terminate until the first of August, hence the reorganization date being set at that time. With the purchase of the Garford and the recent purchase of the Gramm plant at Lima, O., the Overland dealers will have a complete line of pleasure cars and trucks to suit all tastes and purses. The Garford plant covers 23 acres and is unusually well equipped, but in the past things have combined to prevent the most being made of its facilities.

WILL BROWN IN NEW COMPANY

Indianapolis, Ind., July 15—The Brown Commercial Car Co., of Peru, Ind., has been organized by Will H. Brown, with whom are associated several prominent bankers and business men of Peru. Mr. Brown is president of the new company and Carl H. Wallerich vice-president. The former is president and general manager of the Mais Motor Car Co., of this city, maker of the Mais truck, and he will continue to manage the Mais company and also give considerable time to the new enterprise. Mr. Wallerich resigns as manager of the General Industrial and Mfg. Co., of this city, to join the Brown forces at Peru. The Brown company will take the plant formerly used by the Otis Elevator Co. A light delivery commercial vehicle will be built.

Elgin Road Races Again on Calender

Chicago Automobile Club Undertakes Promotion of Annual Contests—Dates Selected Are August 30-31—Four Non-stock Events and Cash Prizes of $6,000 Offered

CHICAGO, July 15—The annual road races at Elgin, Ill., will be continued after all, the Chicago Automobile Club having taken the place of the Chicago Motor Club as promoter, the alliance with the Elgin Automobile Road Race Association being completed this week. Following the closing of the deal, there was a change in dates, the races being billed for August 30-31 instead of August 23-24, which had been selected by the Chicago Motor Club. This move was made in order to have more time in which to complete the details. The Milwaukee Automobile Club has consented to this change, believing there will be no conflict with the Vanderbilt and grand prix.

No attempt will be made to run stock cars as in the past, for it is recognized that it would be almost impossible to get together representative fields. There will be four races, as heretofore, but instead of having three races one day and one the second, there will be two races each day, with the free-for-all the trump card. The complete card is as follows:

FRIDAY, AUGUST 30

Aurora Trophy Race—Open to class C, non-stock, division 3-C, for cars of 281-300 cubic inches piston displacement; distance 152.5 miles or eighteen laps of the circuit which is 8 miles 2,490 feet in length. Prizes: Aurora trophy and $700 in cash to the winner; $200 to second and $100 to third.

Illinois Trophy Race—Open to class C, non-stock, division 4-C, for cars of 301-450 cubic inches piston displacement; distance 203 miles 1,896 feet, or twenty-four laps. Prizes: Illinois trophy and $700 in cash to the winner; $200 to second and $100 to third.

SATURDAY, AUGUST 31

Elgin National Trophy Race—Open to class E, non-stock, open to class C cars of 600 cubic inches piston displacement and under, made by a factory which has during the 12 months prior to date of the contest produced at least fifty motor cars, not necessarily of the same model; distance 254 miles 1,050 feet, or thirty laps. Prizes: Possession of the Elgin National trophy for 1 year and $1,000 in cash to the winner; $300 for second and $200 for third.

Free-for-all—Open to any car conforming to the definition of a motor car as defined by the American Automobile Association; distance 306 miles 920 feet, or thirty-six laps. Prizes: $1,750 in cash to the winner; $500 to second and $250 to third.

The entry fee in each case will be $100 per car, a reduction from the $300 for first, $200 for second and $100 for the third car charged last year. Also the Elgin association has more than doubled last year's prize fund. Whereas in 1910 and 1911 this amounted to $2,500, this time the association is hanging up $6,000. It is possible for an Elgin National trophy car to run in the free-for-all at the same time, which is likely to augment the field in the big event.

No time has been wasted in getting after the entries. Fred J. Wagner has been appointed representative of the club in the east, while in the western territory the work of securing entries will devolve on F. E. Edwards, chairman of the technical committee of the American Automobile Association, who also is a member of the contest committee of the Chicago Automobile Club. Application for a sanction has been granted and entry blanks are now being distributed. Entries will close August 24.

Tentative nominations already have been made, pending the issuing of the blanks. Ralph Mulford and Erwin Bergdoll, who passed through Chicago Friday on the way home from the Tacoma road races, both promised to drive at Elgin, while Mulford further volunteered to go after the entries of Teddy Tetzlaff, David Bruce-Brown and Ralph de Palma. It also is thought there will be nominations made almost immediately by the Mercer, Cino, Stutz and several others with whose makers members of the club's contest committee have been in touch.

It will not require much work to put the course in shape and Elgin has plenty of time in which to smooth out the wrinkles. Had the deal been closed earlier the backstretch would have been widened, but that will have to wait until another year. The citizens of Elgin are more interested than ever, for when it looked as if the races would be abandoned they began to realize what they were losing.

The deal also marks the return to the promotion field of the Chicago Automobile Club, which has held aloof from the sport since the Crown Point road races in 1909, which were handled by the C. A. C.

MILWAUKEE RAISING MORE MONEY

Milwaukee, Wis., July 16—The Milwaukee Automobile Dealers' Association, promoter of the grand prix, Vanderbilt, Pabst and Wisconsin Challenge road races at Milwaukee on September 17, 20 and 21, is plugging hard to get together its big fund needed to cover the expense of the reconstruction of Milwaukee county roads, erecting or leasing grand stands and other official stands, and a hundred and one other matters in connection with the running of the biggest road racing carnival in the history of motoring. While the $50,000 guaranty fund has already been filled by subscription among the big business men, hotelkeepers and individuals, the association is seeking to play safe and sure by adding about $25,000 to the amount.

Members of the association are so busy with the race preparations that only a few had time to compete in the third annual Wisconsin reliability tour this week, but the racing interest is being cared for on quite an extensive scale by the distribution of advertising matter from the cars participating in the run. The only members of the M. A. D. A. who have cars in the tour are the Bates-Odenbrett Automobile Co., White, Abbott and Krit, and the Hickman-Lauson-Diener Co., Ford. It has been expected that all of the members of the association would take advantage of the opportunity given by the tour to advertise the races, but the work at home is keeping them altogether too busy.

Hundreds of reservations for seats and parking space are already on file in the office of Race Secretary Bart J. Ruddle, and each day brings a bag full of mail and a hundred long distance calls, to say nothing of the telegraph, from even distant parts of the country. The interest is said by the railbirds to be as great at this time as it was during the last few weeks before the last races at Savannah.

REVIVING FAIRMOUNT PARK RACES

Philadelphia, Pa., July 12—In addition to a bill now awaiting action in councils to the end that the Fairmount Park commission revoke its action of last spring in abolishing the Fairmount Park road race, a petition addressed to Mayor Blankenburg for renewal of the annual classic is being circulated, largely through the efforts of Harry C. Harbach, former secretary of the Quaker City Motor Club. It is planned to take the responsibility for backing the race out of the hands of the commission and have the municipal authorities stand sponsor, together with local motorists.

CLEVELAND RUN ABANDONED

Cleveland, O., July 15—Announcement was made late Friday afternoon in Cleveland that the third annual run, conducted by the Cleveland News, would not be held July 15 to 18, as planned. The abandonment of the tour was occasioned primarily because as the starting day approached it became more and more evident that the event this year would not have the broad character of previous years and would therefore fail to meet the prime purpose of the undertaking. While the entries were generous and the party promised to be nearly as large numerically as last year, variety of make was lacking, and in that variety lay the chief public interest in the event.

TWO SHOWS FOR BOSTON

Boston, Mass., July 15—Boston will again have two shows in 1913. The pleasure car section under the auspices of the Boston Automobile Dealers' Association, Inc., will be held as usual in Mechanics' building, March 8 to 15, inclusive, and the truck show held by the Boston Commercial Motor Vehicle Association, Inc., from March 19 to 26, inclusive.

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Expensive Repairs

CAR owners are compelled monthly to pay larger repair bills than they should because the repairmen are ignorant of car construction and do not know the proper way to go about making a certain repair. As they charge for the hours spent on the job, it often happens that dollars find a place on the bill that go to pay for needless work. There are many examples of such. One example is removing the gearbox to take out the clutch, when, if the proper course were followed, it would not be necessary to touch the gearbox at all. Another example is removing the underpan for certain carbureter adjustments on some makes of cars. Scores of examples could be cited, each of which plays its part to swell the repair bill and widen the gap between car owner and repairman. Car makers can do much to eliminate this repair expense. A Pennsylvania reader of Motor Age has made the admirable suggestion that car makers publish booklets stating just how repairmen are to go about making certain repairs, replacements or removing certain car units to clean them. Such a book could contain illustrations showing the proper course to follow in adjusting a clutch, in removing the motor bed, in removing the water pump, the radiator, or a score of other things. With such a book the car owner would have the assurance that the repairman was at least going at the job in the proper sequence, and while not assured of the most expert and speedy work, he would be certain of no loss of time due to taking off needless parts and doing many other foolish things. Such a book could be in the hands of different repair shops, so that soon there would be developed in every city good crews of workmen, workmen working under instruction. The result would be increased earning capacity to the individual workmen, increased capacity to the repair shop and lower bills and better work to the car owner.

The Four-Speed Gearbox

THE four-speed gearbox is in the public eye more today than ever before and it looks today as if 1914 will see more or less of a general introduction of it in the medium and low-priced American cars. Today America is just emerging from the influences of a campaign started several years ago for everything on direct drive. In those days one foreign maker actually tried to demonstrate the possibility of eliminating the gearbox from a six-cylinder car and actually made many long cross-country runs with such a model. The demonstration was of practically no value to the car industry and was diametrically opposed to the best practices in cardom. In America there were many concerns that made long-distance runs with all indirect gears removed from the gearbox or with them locked. In every case where such performances were made high-powered motors were used, and no reports were made on the ability of the motor to stand up under such service or of the wear and tear on the chassis parts. Many of the leading American high-priced cars have used the four-speed set for several years and others are taking it up for 1913. With the four-speed gearset it is possible to get much higher efficiency out of the motor at much less expense. It is expensive when in climbing a long hill the motor is forced to pull to its limit and to keep on pulling like that up the last part of the hill, the driver wondering if he will have to change speeds or not. Such performances do much damage.

Adequate Lubrication

THESE are touring days and days when adequate motor lubrication is a necessity. The motor lubrication is more difficult in extremely hot days than in cooler weather because of the higher oil temperatures and the loss in quality of the oil because of this higher temperature. The lubricating qualities of oil depend on its viscosity; that is, its ability to hold together and to spread out into an extremely thin film between the wearing surfaces without breaking. The cooler the oil the higher its viscosity, and the hotter the oil the lower and poorer its viscosity. Oils vary much in their viscosities. There are many oils that have the same viscosity at temperatures of 100 degrees Fahrenheit, but which have entirely different viscosities at 200 degrees. The quality of an oil largely depends on its ability to retain its viscosity at high temperatures. In hot weather the motor temperatures are higher than in cooler weather, consequently the lubricating qualities of the oils are reduced and lubrication troubles may come that ordinarily would not be known of. The owner can take a few precautions. He may be required to use a heavier oil, considerably heavier than he used in the winter months. If he used a light in the winter he may use a heavy now and it will feed little faster than the light one did in the cold weather. In addition to using heavier oils it will be necessary to periodically drain off the oil in case a circulating oiling system is used. Not a few car owners fill the oiling system every 300 miles. When such refillings are made it will be well to drain off the old supply and cleanse the crankcase thoroughly with kerosene. With such precautions lubricating troubles will be reduced. The owner must remember that he drives much more in the hot weather per week than he does in the cool weather and so must proportionately increase his attentions to the oiling systems.

Sane Road Driving

THOSE amateurs driving cars for the first time and whose driving to date has been confined to city boulevards and short trips over adjacent country roads should exercise special cautions when they start out on all-day country tours over unknown roads. Many accidents occur weekly due to a little too much risking on the part of such drivers. It is one thing to drive a car at legal speeds on city and suburban streets and it is an entirely different task to drive over unknown and varied country roads. The amateur driver must beware of sudden curves, as he will underestimate his speeds and will find himself unable to keep the road and will overrun into the ditch. This is a common fault and one that has caused many accidents. Keep the car under perfect control, particularly on curves and most particularly those in which the road is hidden by shrubbery and there is a probability of cars or horse vehicles traveling in the opposite direction. Soft, wet spots in country roads are dangerous. Slow up on approaching them. Many accidents have been due to a wheel hitting one at speed and skidding the car and upsetting. Soft sand spots are equally dangerous. Speeds must be reduced in sand; otherwise it is dangerous and the car framework and running gear will be badly strained when running into sandy stretches at speed. Crowned roads often are dangerous for speeds over 25 or 28 miles per hour. The amateur driver should keep his speed down until he has fully satisfied himself with the road condition.

English Road Expert Visits America

W. Rees Jeffreys Discusses Highways in This Country

BOSTON, Mass., July 13—W. Rees Jeffreys, of London, Eng., honorary secretary of the Permanent International Association of Road Congresses, is in Boston as the guest of Colonel William D. Sohier, chairman of the Massachusetts Highway Commission, and President Lewis R. Speare, of the Massachusetts State A. A.

Mr. Jeffreys was appointed secretary of the road board of England in July, 1910, and previous to that time he was secretary of the Motor Union of England and also of the Commercial Users' Association and Roads Improvement Society of Great Britain. He is the honorable secretary of the third international road congress to be held in London, July, 1913, when highways and roads will be discussed by the most prominent men from all over the world. As an author he is recognized as an authority on highway administration and motor traffic. The board of which he is secretary spends annually $7,000,000 in helping the counties on various through routes.

Mr. Jeffreys was a guest of honor at a dinner tendered him at the Union Club Thursday night by Colonel Sohier, which was attended by Governor Foss and others. In discussing his visit to this country Mr. Jeffreys said:

Mr. Jeffreys Makes Comparisons

"There were two objects I had in mind when I started for the United States in June. The first was to invite the United States government to become a member of the Permanent International Association of Road Congresses, a body that was formed 6 years ago and which now includes all the principal governments of the world with the exception of the United States. My second object was to invite the several states and a number of the different cities to send delegates to the congress next year, where the delegates will have an opportunity to study the English system of road construction and maintenance and of meeting the leading highway engineers of Europe, exchanging with them ideas on road conditions.

"There is much in the English methods and practices that would prove useful to American engineers, for they would have an opportunity to learn from our mistakes and experiences and not repeat these mistakes over here. One thing in which the English experience would be most helpful is our practice in England of continuous maintenance, because I think a lot of money is being wasted in some of the states owing to the fact that while large appropriations are made for the construction of roads, not enough provision is made for maintenance afterward.

"From the moment it is made a road requires attention. By our system a length of road of certain mileage is put under what is termed a lengthman. His duty is to attend to the small repairs, to patch a hole as soon as it appears, keep the water course clear, and trim the sides of the road. As soon as the surface shows signs of wear, along comes the steam roller gang and a new top coat is placed on the highway. As a result of this the main structure never is cut into by heavy traffic. The roads in the United States that I have seen are well made, but they are not maintained properly. The result is that the subcrust or foundation is gradually being destroyed and the capital expended is largely wasted.

"Particularly is this true in such states where after building a highway its maintenance is turned over to local authorities, taking it out of state control. The best continuous roads I have seen in the United States are those of Massachusetts. That state is more wise than some of the others, for it has taken over into central control 900 miles of highways and is attempting to make better provision for their maintenance. Our experience, based on many years of building, has shown us that it is better far to put the maintenance of roads into the hands of authorities, with adequate financial resources, who will employ and pay competent engineering staffs. It is really essential to the life of a road that there shall be no divided authority where one stretch may be neglected and others kept in good shape.

"I believe that the United States through the federal government and the state authorities can well afford to concentrate on continuous lengths of road between various centers of population. For instance, you have no good road from New York to Philadelphia; no good road from Philadelphia to Washington, from Washington to Pittsburgh, and from Pittsburgh to Chicago. These roads when once constructed should be properly maintained, of course. In England we have the advantage, for our roads are put down with macadam. You may travel from any part of Great Britain to another over a smooth and dustless road. This is due to the fact that the road board helps the local authorities in strengthening the highways so that they may bear commercial traffic; to keep them dustless, and to widen the road where the width is not sufficient for commercial purposes.

Keeping Highways Dustless

"There are three methods by which the highways are kept dustless. One is the application of tar every year; a second, to surface them with tar macadam; and a third, to put down a surface and grout it in with pitch and asphalt. The road board grants $7,000,000 a year to local authorities to improve the roads. These various methods would be interesting to the road engineers of the United States. In the matter of road construction the United States is much further advanced than Canada."

Mr. Jeffreys praised the park system in Chicago, and he said that up to the time that he reached that city he had not seen roads as good that were constructed at a low cost. In other words, Chicago had the best and cheapest roads that were constructed up to that time. His tour of this country included New York, Philadelphia, Washington, Chicago, Detroit, Buffalo, Toronto, Ottawa, Montreal and Quebec. He came here from Quebec.

Coming Motor Events

July 15-20—Reliability run; Wisconsin State Automobile Association, Milwaukee, Wis.
July 21—Track meet; St. Louis, Mo.
*July 22—Farm and ranch tour; Dallas, Texas.
July 22-27—Cadillaqua celebration at Detroit, Mich.
August 5-7—Pacific Highway convention; San Francisco, Cal.
August 8-9—Banta trophy team match, Chicago Motor Club.
*August 8-16—Galveston beach meet; Galveston, Tex.
August 10—Hill climb; Whittier, Cal.
*August 30-31—Elgin road races; Chicago Automobile Club; Elgin, Ill.
*September—Commercial vehicle run; Chicago Motor Club.
September 2—Track meet at Winnipig, Canada.
September 3-6—Chicago Motor Club's truck demonstration.
September 17 — Grand Prix; Milwaukee, Wis.
September 20 — Wisconsin challenge and Pabst Trophy races; Milwaukee, Wis.
September 21—Vanderbilt road race; Milwaukee, Wis.
September 17-20—Fire engineers' convention; International Association Fire Engineers, Denver, Colo.
September—Track meet; Universal Exposition Co., St. Louis, Mo.
*October 7-11—Chicago Motor Club reliability run, Chicago.
October 12—Track meet; Rockingham park, Salem, N. H.
November 6—Track meet; Shreveport Automobile Club, Shreveport, La.

*Sanctioned by A. A. A.

SHOWS

July 10-20—Canadian Industrial Exhibit; A. C. Emmett, manager motor section; Winnipeg, Can.
September 23-Oct. 3—Rubber show, Grand Central palace, New York.
September 26-Oct. 6—Exposition agricultural motor cars, Bourges, France.
November 8-16—Olympic show; overflow November 22-30 Agricultural Hall.
December 7-22—Paris salon.
January 4-11, 1913—Cleveland show.
January 11-18—New York show.
January 11-22—Brussels, Belgium show, Centenary Palace.
January 20-25—Philadelphia show.
Jan. 27-Feb. 1—Detroit show.
February 1-8—Chicago show.
February 10-15—Minneapolis show.
February 17-22—Kansas City show.
Feb. 24-March 1—St. Louis show.
March 3-8—Pittsburgh show.
March 8-15—Boston show.
March 17-22—Buffalo show.
March 19-23—Boston truck show.
March 24-29—Indianapolis show.

Sections of the Mississippi River.

although the roads were littered with branches for many rods.

Lake Geneva, the famous summer resort, and home of many of Chicago's wealthiest and best known people, was the noon control, where each car was obliged to remain for 1 hour. From here it was but a short run to Beloit, the night control, and the 40 miles were covered in double quick time by the drivers, most of whom have gone through previous Wisconsin reliabilities and forgot that they had but 112 miles to make for the day as compared with 175 and 200 per day in previous runs.

Second Day's Run

Baraboo, Wis., July 16—Another record was hung up by cars in the annual reliability tour of the Wisconsin State Automobile Association today when every one repeated its performance of Monday and finished the run from Beloit to Baraboo with perfect scores. The performance was all the more noteworthy in view of the fact that the day's schedule took the tourists up and down the ridges which skirt the Wisconsin river valley, over bad roads and treacherous Springfield hill, near Middleton, long a bugaboo to motorists.

CINO WINS AT PORTLAND

Portland, Ore., July 12—Portland got a taste of thrills and excitement Tuesday during the race meet at the Country Club track. Barney Oldfield featured the racing by driving the Christie the fastest mile ever turned on that track. Oldfield made the circuit in :53 flat.

The races were featured by the consistent and surprising work of the 30-horsepower Cino racer which Fritsch drove to victory after victory. Fritsch won the 5-mile free-for-all and was awarded the Budweiser cup. Fritsch also won several other races and drove 5 miles in the fast time of 4:48. In the big-car event Teddy Tetzlaff had to drive his best to go 5 miles in 4:47. A 5-mile match between Fritsch in the Cino and L. Heinemann, piloting the Prince Henry Benz, was won by the Cino in 5:21½. Teddy Tetzlaff made a runaway of the second race. He was pitted against Verbeck, also in a Fiat. Teddy drove rings around his team mates and won as he pleased in the fast time of 4:59.

The contests for the mile track record next followed. Chris Dundee in Whistling Billy did it in :59 and then went again for a second mile in :54⅘. Teddy Tetzlaff followed in his Fiat and thundered around the mile track faster than the Whistling Billy. He turned the mile in :54. Then came the Christie, which did :53. In the last race only Tetzlaff and Fritsch started. Teddy won all the way in the fast time of 4:47, the Cino showing a bad tire.

Oldfield again was the big feature the second day of the meet, cutting down the time for the course to :52 and breaking all mile track records for the Pacific coast. The best previous time was :52⅘, made by the same driver on Ascot Park track in Los Angeles 3 years ago. Tetzlaff turned the mile in :53⅕ in a 60-horsepower Fiat.

In the first event of the day, a 3-mile match race between Heinemann in a Benz and Fritsch, the Cino pilot, a stirring finish thrilled the crowd. Heinemann won in 3:01. Oldfield, driving the Christie, met the winner of this event in a 2-mile race and won in 1:51.

One of the best races of the day was when the three-man Fiat team hooked up in a match race. Tetzlaff, Verbeck and Hill were at the wheels. Tetzlaff won in 5:16⅘, while Verbeck crossed the tape 4 seconds later.

In the 5-mile race for cars of 600-cubic-inch piston displacement Tetzlaff hooked up with Fritsch and Heinemann, of the Oldfield string. His car was by far the fastest. His time was 4:39⅘.

Fritsch was not satisfied with his first try against Heinemann and the latter agreed to give him revenge. This was a race not on the program, and it turned out to be the most exciting of the lot. Heinemann finished just a nose in front of the Cino. His time was :54⅘.

Tetzlaff gave an exhibition of quick tire changing. He and Hill, his mechanician, made a complete change and put their car under way in 30 seconds.

LIST OF STARTERS IN WISCONSIN STATE TOUR

No.	Car.	Model	Entrant	Driver and Alternate	Observer and Alternate
1	Buick	1913 40	Hokanson Automobile Co. Madison, Wis.	†Emil Hokanson	William Prielipp
2	Case	5	J. I. Case T. M. Co. Racine, Wis.	Chris Hanson	Oliver Jackson
3	King	1913 36R	Hustis Brothers Milwaukee	H. Hannemann	R. L. Hustis
4	Krit	K	Bates-Odenbrett Auto Co. Milwaukee	P. B. Hustis	
5	Hupmobile	32R	J. E. Morehouse Co. Milwaukee	James Holmes W. E. Smith	M. E. Chamberlain
6	Ford	T	Hickman-Lauson-Diener Co. Milwaukee	Jay E. Morehouse	George A. Crittenden J. G. Burnham
7	Flanders	20	Thom Automobile Co. Oshkosh, Wis.	William H. Diener	J. E. Nelson
8	Flanders	20	Staatz Automobile Co. Madison, Wis.	Tom R. Bell	H. E. Legnard
9	Oakland	30	Spooner-McConnel Auto Co. Madison, Wis.	W. H. Soules	J. L. Lubeck
10	Paige	Brooklands	R. D. Rockstead Milwaukee	C. F. Spooner	L. J. McConnell
11	Marion	37	W. E. Allen Co. Milwaukee	R. D. Rockstead	Dr. F. C. Studley
12	White	30	Bates-Odenbrett Auto Co. Milwaukee	H. R. Gallun H. Gethens	E. C. Derkin
			EMIL SCHANDEIN TROPHY—PRIVATE OWNERS' DIVISION		
1	White	30	H. O. Stenzel Milwaukee	Charles R. Johnson Robert G. Bates	Paul Weber
2	Franklin	D	J. D. Babcock*	H. O. Stenzel J. D. Babcock	F. A. Bardeen Ralph Miller

† Winner in 1910
* Winner in 1911

NAPIER IN HIGH SPEED GEAR TEST

London, July 10—Starting June 3 and finishing on June 18, the six-cylinder Napier, entered by S. F. Edge, has completed a top-speed and economy test under the open competition rules of the Royal Automobile Club. The car entered was a six-cylinder open touring car, with a 5-inch bore and stroke. The horsepower was rated at 59.9, and the total weight of car and load was 4,990 pounds. The high speed was geared 3 to 1, and the whole run was made in this gear. The route led from London to Lands End, John o' Groats, Edinburgh, and back to London. The total distance was 1,928.75 miles, and the run was completed at an average speed of over 19 miles per hour, a maximum of 77.104 being reached on the Brooklands track after the run. Gasoline consumed was 80.64 gallons, making an average of 23.918 miles per gallon, or 53.281 ton-miles per gallon.

CANTON STOPS SUNDAY RACING

Canton, O., July 15—With the authority of the attorney-general of the state in the form of warrants issued in response to an appeal from the Christian Endeavor, Sheriff Oberlin, with the aid of the Canton militia, succeeded in stopping the motor races being held at the fair grounds yesterday, and arresting the two drivers, Bob Burman and Harry Kyle. An angry mob made the work of the sheriff and his forty deputies extremely difficult. Several thousand spectators demanded their money back but were told that the races would be continued Monday. The charge set forth in the warrants was of violating the Sunday observance laws, it being held by the attorney-general that motor races were unlawful on Sunday.

TEXAS WANTS A SPEEDWAY

Dallas, Texas, July 15—Planning a motor race track that will rival those in Indianapolis and Atlanta, Secretary Ed Vaughn, of the Dallas Automobile Club, has gone to St. Louis and other cities to get capital interested in the movement for this city. A corporation chartered for $200,000 under the laws of Texas is planned to assure the success of the race track. In all probability the course will be built of brick and not asphalt.

Stearns Agents Celebrate a Birthday

First Anniversary of Adoption of Knight Sleeve-Valve Motor Brings Together Many Dealers Who Talk Prospects and Learn of New Ideas Put on the 1913 Models

CLEVELAND, O., July 15—The past week witnessed the annual convention of branch managers, traveling representatives and dealers of the F. B. Stearns Co. at the Stearns factory at Cleveland. The meeting marked the first anniversary of the Stearns-Knight car, for it was just 1 year ago that this old Cleveland firm announced the adoption of the sleeve-valve motor, to the total exclusion of the poppet valve.

The convention was the largest and most enthusiastic in the history of the company. Distributors from practically every state were present, and the orders placed for quick delivery of the new models gave the largest total week's business ever done by the Stearns company.

An exceptionally large number of new models were placed on exhibition, including five and seven-passenger touring cars, four-passenger runabouts and three-passenger roadsters, in addition to new designs in closed cars.

The new models disclosed the fact that the Stearns equipment has been made even more complete, a self-cranking device having been added in addition to the top, windshield, electric generator lighting system, speedometer, electric horn, demountable rims, etc.

One innovation on the new Stearns model was furnished by the entire carrying equipment; all tires are now carried at the rear of the car, thus leaving the running boards clean. The battery box, tool box, etc., have also been taken off the running boards. The electric light in the tonneau has been placed at the bottom of the door on the right side, with the switch just in front of the arm rest.

The convention lasted the entire week, business sessions being held in the afternoons. Addresses on the policies of the company were made by President Frank B. Stearns, E. McEwen, secretary and treasurer; T. A. Boyle, head of the service department, and Henry H. Hower, advertising manager. The records showed that the Knight type motor had practically doubled the Stearns business in the past year. On the evening of Tuesday, July 9, the visitors and heads of departments at the home office were the guests of President Stearns at a banquet at the Cleveland Automobile Country Club.

PLANS OF W. C. DURANT

New York, July 17—The Republic Motor Co. of New York expects to be in full possession of its new headquarters at Eleventh avenue and Fifty-seventh street in 90 days. It has been learned that it intends to build two styles of cars, a four-cylinder light type to be sold at $715 and a six-cylinder five-passenger touring car to be sold at $1,000.

W. C. Durant, prime mover in the company, stated that it is the belief of the concern that further economy in the motor industry will not be in the manufacture of the car but in its distribution. The Republic Motor Co. is designed especially to secure greater economy in the distribution and to go still further in selling each locality a car which is adapted especially for that vicinity. He stated that it was necessary for a car that was designed to meet all sorts of service to be a compromise as a car designed for flat country would be under extreme disadvantages in hilly country. This condition is to be met by the establishment of ten factories in the largest distributing centers.

The parent or holding company is the Republic Motor Co. of Delaware, which has been incorporated for $65,000,000, the stock being divided up into $15,000,000 of 7 per cent cumulative preferred and $50,000,000 common. The ten operating companies are each incorporated at $1,500,000. They all have the name of the Republic Motor Co. and are located in New York, Boston, Philadelphia, Chicago, St. Louis, Kansas City, Minneapolis, Portland, Ore., Los Angeles and San Francisco.

DETROIT TRADE GOSSIP

Detroit, July 15—The Suburban Motor Car Co. of this city is to begin operations at once on its factory at Ecorse, a new suburb which is 7½ miles from city hall, W. A. de Schaum, chief engineer and general manager of the company, having recently awarded the contracts for the excavation work. The plant is to be entirely of reinforced concrete construction. The main structure will have a length of 400 feet and a width of 80 feet, the roof being of saw-tooth construction. There are to be four side buildings, each being 60 by 400 feet. In front of these an administration building, 60 by 300 feet and two stories high, will be built after the factory has been completed. The power house will measure 150 by 200 feet, and it is planned to light the suburb by this plant, as well as to furnish power for the factory. There will be no overhead shafting in the plant, the machinery to be driven by motors, in some cases these power units being for individual machines and in others for several in groups.

It is planned to build 1,000 cars in the new factory for the coming season, according to M. de Schaum. Three machines already have been constructed and twenty-five are to be put through the temporary plant immediately. While these are all four-cylinder types, it is planned to build both fours and sixes in the new factory. The four-cylinder model is rated at 30 horsepower and has a unit power plant. The wheelbase is 114 inches and there are two body types, a roadster and a five-passenger touring car.

Between sixty and seventy-five branch managers and dealers will be in convention at the Lozier factory this week. On Tuesday the branch managers will meet for a discussion of plans and trade conditions for the coming season, while the 3 following days will be devoted to the dealers. On Saturday the entire assemblage will be entertained by the company at Put-in-Bay. This meeting of representatives is a yearly affair with the Lozier company.

BOARD OF TRADE SETS SHOW DATE

New York, July 15—The Automobile Board of Trade at its quarterly gathering in New York city Thursday listened to the report of the show committee, covering plans for the big exhibition of next January, which will be conducted in two buildings—the new Grand Central palace and the Madison Square garden, with a single admission covering both buildings. It was definitely decided to open the show on the evening of January 11, 1913, with an exhibition of pleasure cars in both buildings, continuing until the 18th. The commercial vehicle division, which will be held in both buildings, will open on the evening of Monday, January 20, closing on Saturday evening, January 25.

Suitable resolutions were passed on the death of Alfred N. Mayo, of the Knox Automobile Co., one of the oldest members of the Automobile Board of Trade and a leader in the industry since its inception.

It also was voted to begin compilation of data for the publication of the 1913 hand book.

LOCOMOBILE INCREASES STOCK

New York, July 15—In order to take care of real estate deals involved by the building of several large service buildings in some of the leading cities, especially New York, Chicago and Philadelphia, the Locomobile Co. of America has increased its capitalization from $5,000,000 to $6,500,000.

NEW ONE FOR PITTSBURGH

Pittsburgh, Pa., July 15—Through the efforts of the Pittsburgh Industrial Development Commission, this city has located a new motor industry. It will employ 250 men at the outset and will manufacture 500 pleasure cars as the first year's output. The new concern is known as the Duquesne Motor Car Co., and is a close corporation,

financed by a small number of leading business men of Pittsburgh. W. L. Rodgers, president of the Pittsburgh Gage and Supply Co., is president of the new company. Oscar J. Howick, formerly a designer for Lozier, and Frank H. Morse, former Kisselkar engineer, are associated with the new company, the former as designer and the latter as engineer. The company has established its plant at Thirtieth and Liberty streets, where it occupies a floor area of 60,000 square feet. The first model will be a four-cylinder, five-passenger car with a 50-horsepower T-head Wisconsin motor. The company proposes to enter the motor truck field in the fall. The car will be known as the Duquesne. The Duquesne Motor Car Co. has a present nominal capitalization of $25,000, which will shortly be increased to $250,000. R. F. Ramsey, of Pittsburgh, is treasurer of the company.

SWINEHART SUES FOR ACCOUNTING

Akron, O., July 13—The Swinehart Tire and Rubber Co. has filed suit in the court of common pleas against the Diamond Rubber Co., asking for an accounting of all business done by the defendant company in the sale of elastic vehicle tires since April, 1910, manufactured, it is claimed by permission of the Swinehart company, which, it is asserted, controls the patents.

NEW MOON ADVERTISING MAN

St. Louis, Mo., July 15—The rapid expansion of the business of the Moon Motor Car Co., of St. Louis, has necessitated the appointment of a new advertising and publicity manager, Walter C. Barnes of Springfield, Ill.

RECEIVER FOR THE GROUT

Orange, Mass., July 13—Creditors of the Grout Automobile Co., of this city, have appointed as receiver R. T. Shumway, of Orange, which appointment has been approved by the court. Mr. Shumway has not as yet decided what to do in the matter, but will look over the situation carefully.

PROGRESS OF ALCO TRUCK

Central City, Neb., July 12—The climax to many enthusiastic demonstrations along the way was reached today when Mayor Wolz, of Fremont, came east to meet the transcontinental Alco truck. With an escort party he piloted the vehicle for 30 miles and then arranged for pilots and courtesies across the state of Nebraska. In contrast to the hard going over Iowa roads the truck today negotiated 133 miles, and it would have covered more but for the delays necessitated by the ovations accorded it. The day's run was made with the temperature at 94 degrees.

FOSDICK QUITS STEVENS-DURYEA

Springfield, Mass., July 15—Harry Fosdick, sales manager of the Stevens-Duryea, has resigned as sales manager of that company.

England Holds Another Stock Car Race

Singer Wins 277-Mile Event on Brooklands Track, Averging 57.5 Miles Per Hour—Gladiator Beaten Two Lengths —Contest Limited to 20.1-Horsepower Machines

LONDON, July 16—Special cablegram—The second annual stock car race run under the auspices of the Royal Automobile Club, was contested today on Brooklands track and was won by Herbert's 21.1-horsepower Singer, driven by Haywood, who traveled the 277 miles in 4 hours 48 minutes 46⅘ seconds, an average of 57.5 miles per hour, defeating by two lengths the 15.9-horsepower Gladiator, driven by Gordon Usmar, whose time was 4 hours 48 minutes 47⅗ seconds. The third and only other car to finish was the 20.1-horsepower Turcat, driven by Mery, which covered the distance in 6 hours 18 minutes 17 seconds or 43.8 miles per hour.

The race was for stock cars not exceeding 20.1-horsepower, and fourteen cars were entered. There were several scratches, though, two Sunbeams being withdrawn last Friday; two Stars disqualified for being sporting models, not standard; a Straker-Squire disqualified for having racing gears, while a Gregoire failed to come to the tape.

Early in the race the three Singer cars took leading positions, followed by the Vinot, Crespelle, Turcat and Scar in the order named. The Vinot ran out its metal bearings, two Singers broke timing gear chains, while the leading Singer broke an exhaust pipe. Haywood repaired this twice and yet won. Both the winning Singer and the Gladiator went through without tire troubles, although others had numerous punctures and blowouts. The Gladiator made only one stop, that being in the seventy-first lap of the 100-lap race, when the oil supply was replenished.

The first stock car race at Brooklands was run last year, the winner being a Star, which averaged 56.24 miles for the 277 miles. That event, however, had a limit of 15.9 on the horsepower, and the weight was limited to 1,600 pounds. A similar race at 50 miles was run in October, 1911, the winner being Coatalen in a Sunbeam, who averaged 58¼ miles per hour.

WOLVERINES PLAN CLUBHOUSE

Detroit, Mich., July 13—The members of the Wolverine Automobile Club of this city now feel that the building of the proposed new club house is a certainty, the site for its erection having been finally secured on Thursday, $18,000 having been advanced on the purchase price. A meeting was held at the Pontchartrain Wednesday night at which the arrangements were submitted to the members and an appeal was made to all to cooperate in the completion of the resident list of members. To this end R. A. Miller was made chairman of a special membership committee which is to systematically canvass all prospective candidates for membership.

To make the financing of the undertaking possible it will be necessary to increase the membership to 1,500 resident members and 500 non-residents. It is believed that this number can readily be obtained, once the figures in the motor industries in Detroit are approached properly. To date the club numbers among its members some of the most influential men in this business in the city, as well as many prominent in other fields.

Under the new membership plan 320 are enrolled to date, as well as thirty-two non-residents. By this new plan each member is required to purchase a share, and one only, of stock in the building at $100, interest being at 5 per cent. Non-resident members must pay half of this sum. The dues will be increased to $40 and $20 a year, respectively, for the two classes of membership.

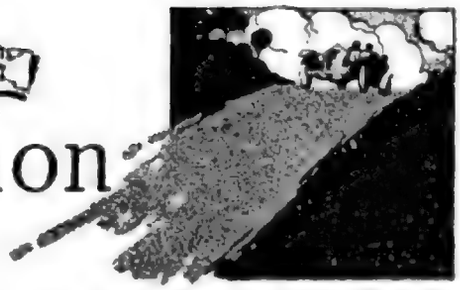
REDWOOD FALLS CLUB RUN

Minneapolis, Minn., July 15—The second annual sociability tour of the Redwood Falls Automobile Club of Minnesota started in a driving rain at 6 a. m. July 12, with twenty-one of twenty-six registered cars in line. There were six Cadillacs in the tour, three E-M-Fs, four Mitchells, a Cole, Kisselkar, Imperial, Locomobile and a Chalmers. The first day's run was through southern Minnesota to Waseca for the night control. Short stops were made at New Ulm, Janesville, Waseca, New Richland and Albert Lea. Mankato was the noon stop, where the tourists were addressed by William Jennings Bryan. At each stop motor cars were picked up as escort to the next large city. Gumbo roads and several side slips resulted in the change of night control 60 miles from Austin. That city became the noon control the second day. The night control at the Hotel Radisson was reached long after dark, and the tourists put up for a rest all day Sunday. The time was spent at the Bloomington Country Automobile Club and touring the city. The last day's run was by way of Lake Minnetonka and along the Minneapolis and St. Paul road to Redwood Falls.

MINNEAPOLIS DELAYS TOUR START

Minneapolis, Minn., July 16—Owing to unavoidable delays the date of starting the Winnipeg tour has been changed to August 8. At a meeting today President C. E. Dutton gave his official sanction to the revised date instead of July 25. Entry blanks will be issued at once and the tour book will be printed.

Routes and Touring Information



THROUGH WISCONSIN

FAIRWATER, Wis.—Editor Motor Age—Kindly inform me of the best route from Fairwater, to Boyd, Wis.—P. N. Korb.

This is a 2-day trip and Stevens Point, 116 miles, can be made the first night. Brandon is about 5 miles to the east of Fairwater and a Blue Book, volume 4, can be used for running directions from this town to your destination. You route through Ripon, Pickett, Oshkosh, Medina, Dale, Redfield, Fremont, Weyauwega, Waupaca, Sheridan, Amherst, and Stevens Point. You will find a few sandy spots between Amherst and Stevens Point, otherwise there are mostly gravel roads.

Boyd is reached with 95 miles registered running through Junction, Milladore, Sherry, Auburndale, Marshfield, Mannville, Spokeville, Loyal, Greenwood, Longwood, Withee, Thorp, Stanley and Boyd. This is over a well-traveled road with a few stretches of sand.

KENDALLVILLE HIS DESTINATION

Chicago—Editor Motor Age—I would like information regarding a route from Chicago to Kendallville, Ind.—C. McKelberry.

The route given in a communication from Chicago can be followed to South Bend, Ind., and you will find the balance of the way to Kendallville included in the answer to an inquiry captioned Chicago to Toledo. The distance between South Bend and Kendallville is 60 miles.

GOING THROUGH ILLINOIS

Cropsey, Ill.—Editor Motor Age—What is the best route from Bloomington, Ill., to Starved Rock, and from Gibson, Ill., to Indianapolis?—D. E. Crum.

Take in Peoria, 43 miles west, traveling over good natural dirt roads with some gravel through Danvers, Mackinaw,, Tremont and Groveland. A run of 85 miles will find you in Starved Rock. With the exception of about 9 miles between Chillicothe and Henry the roads are gravel. The intermediate towns are Mossville, Chillicothe, Henry, Putnam, Hollowayville, Seatonville, Peru, La Salle and Utica.

From Gibson City to Lafayette your mileage is 85 miles, and you will pass through Paxton, Hoopeston, Ambia, Hardy, Talbot, Boswell, Oxford, Otterbein and Montmorenci. A few stretches of gravel or macadam will be found to Hoopeston, and the rest of the way is gravel or stone.

Two roads are offered you to Indianapolis, according to the routes outlined in the Blue Book No. 4, the road conditions being about the same on both, but the mileage by way of Crawfordsville is 74 miles and via Kirklin it is 68. The shortest route lies through Dayton, Mulberry, Jefferson, Frankfort, Cyclone, Kirklin, Rossston, Augusta, Indianapolis; the option goes through Elson, Romney, Crawfordsville, Whitesville, New Ross, Jamestown, Lizton, Pittsboro, Brownsburg, Clemont and Indianapolis.

SEEKS WAY TO ANN ARBOR

Ottawa, Ill.—Editor Motor Age—Please give me the best route from Ottawa to Ann Arbor, Mich.—L. H. Strawn.

Your best route would be to Joliet, Valparaiso, Ind., and South Bend a distance of 154 miles which you can make in one day. To Joliet it is 49 miles through Marseilles, Morris, and Channahon, with only a 10-mile stretch of dirt road entering Morris liable to be bad. Joliet to Valparaiso is 55 miles passing through Cherry Hill, Gaugers, New Lenox, Frankfort, Richton, Dyer, Schererville, Merrillville, and Deep River and with the exception of a few miles of dirt out of Joliet most of the way is on gravel roads. Headed for South Bend motor through Westville, Pinhook, LaPorte, and Stillwell.

This detour from the regular route between LaPorte and South Bend is necessary on account of a section of the through road via New Carlisle being closed. You will have macadam as far as LaPorte but the remaining 25 miles is liable to be soft in very dry weather or after heavy rains.

The South Bend-Kalamazoo stretch is 69 miles by way of Niles, Summerville, Dowagiac, Decatur, Paw Paw and Almena. The routing to Ann Arbor is Galesburg, Gull Lake, Battle Creek, Marshall, Albion, and Concord to Jackson instead of Parma as given by the Blue Book, thence on to Grass Lake, Chelsea, and Lima Center. The road between Albion and Parma is in very bad condition. Kalamazoo to Ann Arbor is 102 miles.

Blue Book No. 4 will supply running directions, maps, distances between towns, hotels, garages, etc.

EMPIRE STATE ROADS

Hoosac, N. Y.—Editor Motor Age—I would like to know the best road between Geneva, N. Y. and Albany, N. Y. What kind of roads can be expected?—L. S. A.

Your route lies to Waterloo and Seneca Falls where you take the ferry to Cayuga to avoid the Montezuma marshes. A good dirt road takes you to Auburn, Sennett, Elbridge, Camillus, Marcellus and Syracuse. This makes a distance of about 50 miles. Follow the state road to Eastwood, Manilus Center, Mycenae, Chittenango, Sullivan, Canastota, Wampsville, Oneida Castle, Sherrill, Vernon, Kirkland, New Hartford, and Utica. Macadam roads prevail from Auburn to Utica, and continue to Deerfield, West Schuyler, Herkimer, Little Falls, St. Johnsville and Nelliston. Cross the river to Fort Plain and take the state road on the south side of the river to Fultonville which is a fair dirt road in dry weather, recrossing the Mohawk again to Fonda, Tribes Hill, Akin and Amsterdam.

There is a good macadam state road to Monaville, Scotchbush, Mariaville and Schenectady on the south side of the river. The main road on the north side of the river between Amsterdam and Albany is under construction, so the macadam road to Pattersonville is taken on the south side of the river, the balance to Albany being fair dirt except in wet weather.

STREATOR, ILL., TO KANSAS CITY

Madison, Wis.—Editor Motor Age—Please give me the best road from Streator, Ill., to Kansas City by way of Rock Island, Des Moines, Omaha, and Lincoln.—E. S. Bruce, Jr.

Ottawa is 17 miles from Streator through Grand Ridge over a gravel road. Davenport, Ia., is but 108 miles west over a gravel road to Utica, La Salle, Peru, Seatonville, Hollowayville, Princeton, Wyanet, and Sheffield, then the dirt road prevails to Mineral, Anawan, Geneseo, Briar Bluff, Moline, Rock Island and Davenport. Starved Rock is about 8 miles from Ottawa and an hour or so can be spent here making either Rock Island or Davenport that night. Des Moines can be planned on for the second night and is a distance of 187 miles over a fast road. The intermediate towns are Stockton, Durant, Wilton, Moscow, Atalissa, West Liberty, Iowa City, Coralville, Tiffin, Oxford, Homestead, South Amana, Marengo, Ladora, Victor, Carnforth, Brooklyn, Grinnell, Kellogg, Newton, Colfax, Mitchellville, Altoona, and Des Moines.

Over rolling country a 158-mile run will take you to Omaha. The White Pole is taken to Waukee, Ontarioville, Adell, Earlham, Dexter, Stuart, Menlo, Casey, Anita, Wyota, and Atlantic then the River-to-River road followed the rest of the way through Marne, Walnut, Avoca, Minden, Neola, Underwood, Weston, and Council Bluffs.

To Millard, Neb., you will have a good macadam road and the balance is dirt through Gretna, Ashland, Waverly, and Havelock, to Lincoln. This distance is 66 miles. There are no heavy grades to Hiawatha, Kans., 149 miles, and the roads are mostly good in dry weather, routing through Princeton, Cortland, Pickerill, Beatrice, Blue Springs, Wymore, Okato, Marysville, Honey City, Baileyville, Seneca, Oneida, Sabetha, and Hiawatha.

The shortest route to Kansas City from this point is not at all good in wet weather. It is 99 miles through Willis, Everts, Huron, Lancaster, Atchison, Lowemont, Leavenworth, Lansing, Wallula, and Piper.

Your option on this stretch lies by way of Topeka and makes the distance 149 miles to Kansas City. It is 70 miles to Topeka over a natural dirt road through Horton, Holton, Mayetta and Hoyt, and then on the Golden Belt route over a very good road by way of Brantville, Perry, Midland, Lawrence, Endora, De Sota, Bonner Springs, and Muncie.

Running directions on this or any optional route in the territory through which you will pass can be found in the Blue Book, volumes 4 and 5. The Mississippi river is the dividing line of the two books.

CHICAGO TO TOLEDO

Chicago—Editor Motor Age—Kindly inform me of the best route from Chicago to Toledo, O., also from Toledo to Detroit and Toledo to Cleveland.—W. J. Horn.

Route through Jackson park, Bryn Mawr, South Chicago, Whiting, East Chicago, Gibson, Hessville, Highlands and Schererville, 32 miles, from which point follow out the directions given to L. W. Strawn, of Ottawa, Ill., as far as South Bend, Ind., then to Toledo, O., 164 miles on gravel or stone roads through Missha-waka, Osceola, Dunlap, Goshen, Benton, Ligonier, Wawaka, Brimfield, Kendallville, Waterloo, Butler, Edgerton, Bryan, Stryker, Archbold, Wauseon, Delta, Crisey, and Toledo.

The distance to Detroit is 76 miles routing through Ida, Dundee, Milan, Stonycreek, Ypsilanti, Wayne, Dearborn and Detroit.

By far the most pleasant trip to Cleveland is assured through Woodville, Fremont, Clyde, Castalia, Sandusky, Rye Beach, Huron, Ceylon, Vermillion, Lorain, West Dover, and Rocky River, which totals 121 miles; but if the weather has been rainy it is best to leave the above at Clyde, and route to Bellevue, Monroeville, Norwalk, Townsend, Wakeman, Kipton, Oberlin, Elyria, and Rocky river.

The Blue Book No. 4 contains explicit running directions on all of these trips, also city maps, best hotels and garages, mileage from town to town, etc.

CROSSING ILLINOIS AND IOWA

Henry, Ill.—Editor Motor Age—Kindly inform me the best route from Henry, Ill., to Rock Island, thence to Des Moines, and from there to Jefferson, Ia. I wish to return to Des Moines and route by way of Quincy, Ill., back home.—R. S. Bayne.

By routing through Putnam and Bureau Junction you reach Princeton, which is 22 miles distant. In the communication from Madison, Wis., you will find your road laid out as far as Des Moines, Ia. En route for Boone, Ia., you will route through Highland Park, Polk City and Madrid, a distance of 43 miles, when you head west 30 miles through Ogden, Beaver and Grand Junction. You will encounter a few short sandy stretches between Des Moines and Boone.

For your return journey go to Ottumwa, 94 miles from Des Moines, passing through Prairie City, Fairmont, Monroe, Otley, Pella, Oskaloosa, Fremont and Cedar. Following the Blue Grass road 81 miles, through Agency, Batavia, Fairfield, Stockport, Hillsboro, Houghton and Denmark, you reach Ft. Madison. Crossing the river into Illinois and continuing to Quincy on the Illinois side, you travel south through Hamilton, just opposite Keokuk, which you can visit if you like, returning to Hamilton and continuing to Ursa for Quincy. The distance from Fort Madison to Quincy is 55 miles.

Your direct line, and probably the best, despite some rolling country around Macomb and Bushnell, takes you through Ursa, Mendon, Loraine, Bowen, Augusta, Plymouth, Tennessee, Colchester, Macomb, Bushnell, Prairie City, Ellisville, Fairview, Farmington, Trivoli, Hanna, Peoria, Mossville, Rome, Chillicothe and Henry. From Quincy to Henry will register 183 miles.

NEVADA TO OKLAHOMA

Oroville, Ore.—Editor Motor Age—Please give me the best motor car route from Winnemucca, Nev., to Stillwater, Okla. Will the snow bother us any as late as November?—C. L. Barnum.

It is very doubtful if you will have any trouble with snow this year as early as the first of November, and a fall tour is considered by many by far the more enjoyable.

The transcontinental route does not go through Winnemucca any longer. From Reno it runs through Fallon, Austin, Eureka, then north to Elko, and by following the railroad in a general way from Winnemucca to Battle Mountain and Palisade, you connect with it at Elko.

You can use running directions in the Blue Book, volume 5, from Elko, Nev., to Enid, Okla., which is not far from Stillwater. Continuing to Hallick, Deeth, Wells, Fenelon and Toana, you reach Cobre, 94 miles. At Wells there is a dangerous railroad crossing for low-hung cars. It is 90 miles to Kelton, passing through Loray, Montello, Tacoma and Lucin. To reach Ogden it is 110 miles, routing through Curlew, Snowville, Blue Springs, Tremonton, Bear River City, Corinne, Brigham City and Ogden. Evanston, Wyo., can be reached in 7 hours and is a distance of 82 miles through Riverdale, Gateway Station, Peterson, Morgan, Devil's Slide, Croyden, Echo, Stone House, Emory, Castle Rock, Wasatch, Evanston.

Evanston to Rock Springs, 121 miles, passes through Fort Bridger, Liman, Granger, Bryan, Green River; to Medicine Bow, 187 miles, the towns are Baxter, Black Buttes, Bitter Creek, Table Rock, Tipton, Red Desert, Wamsutter, Rawlins, Grenville, Fort Steel, Hanna and Carbon. A run of 74 miles will take you to Booster Springs and Laramie.

It is 203 miles to Julesburg by way of Cheyenne, Wyo., through Red Butte, Tie Siding, Buford, Granite Canon, Otto, Borie, Corlett, Cheyenne, Archer, Egbert, Pine Bluff, Bushnell, Oliver, Kimball, Owasco, Dix, Jacinto, Potter, Herdon, Brownson, Sidney, Sunol, Lodgepole, Chappell, Julesburg.

Kearney is reached by routing 197 miles over good natural dirt roads through Brule, Ogalalla, Roscoe, Korty, Paxton, Sutherland, North Platte, Maxwell, Brady Island, Gothenburg, Millow Island, Cozad, Lexington, Overton and Elm Creek.

The Sunflower trail is available going south through Nebraska and Kansas and it runs 249 miles through Minden, Franklin, Reamsville, Kans., Smith Center, Portis, Down, Glen Elder, Beloit, Victor, Denmark, Sylvan, Wilson, Claflin, Ellinwood, which lies on the Santa Fe trail. On the Santa Fe trail going east 57 miles, the towns of Chase, Lyons, Sterling and Nickerson are passed through. Wichita, Kans., is 59 miles by way of Elmer, Yoder, Haven, Mt. Hope and Colwich, and Enid, Okla., 187 miles, is a run through Wellington, South Haven, Caldwell, Renfrow, Medford, Pond Creek and Kremlin.

Travel southeast to Orlando at which point directions to Stillwater will have to be secured.

SHORT CANADIAN JAUNT

Huntington, Ind.—Editor Motor Age—Will you kindly give me a route from Niagara Falls to Toronto, Canada advising me as to condition of the roads? My Blue Book does not cover the territory. I expect to leave on July 21.—O. U. King.

Taking for granted that you have the Blue Book volume 4 you will find your route outlined from Niagara Falls to Hamilton, Can., 51 miles. After paying your $4 for a license and depositing the required bond which is returned to you upon leaving the province, tour through St. Davids, St. Catherines, Jordan, Vineland, Beamsville, Grimsby, Stony Creek, and Hamilton. Your roads are fairly good dirt and gravel.

Volume 1 Blue Book contains the running directions from Hamilton to Toronto which is a 47 mile stretch. You will find improved roads with an occasional poor stretch. The itinerary is Aldershot, Freeman, Appleby, Trafalgar, Erindale, Cooksville, Lambton Mills, and Toronto.

At St. Davids the above outlined route can be left and a run to Niagara-on-Lake included.

Axle Designs Compared

Difference Between Floating and Semi-Floating Axles Defined and Described

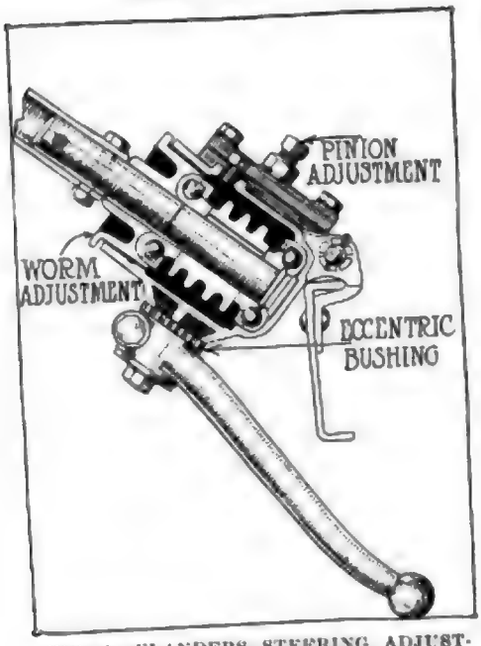


FIG. 1—FLANDERS STEERING ADJUSTMENT

HENRY, Ill.—Editor Motor Age—Please describe the difference between a full floating axle and a semi-floating axle. What points of superiority has the full floating axle over the semi-floating axle?—R. S. Bayne.

The floating axle differs from the semi-floating axle, in that the floating axle carries the wheel bearings outside of the axle housing, the drive axles being clutched to the wheels; while the semi-floating axle carries its wheel bearings inside the axle tube, and the driving axles are rigidly secured to the wheels.

The advantages of the floating axle over the semi-floating type, lie in the fact that the drive axles carry no weight, being subjected to tortional stresses only, whereas the semi-floating drive shafts must bear the weight of the wheel, as the bearings are mounted thereon. The bearings of the floating axle are usually more accessible, and the axle shafts may be removed from the axle assembly without removing the wheels or disturbing the differential. Neither of these are possible with the semi-floating.

Naturally the expense of manufacture of the floating type is greater than that of the semi-floating, and for this reason, in late years, a compromise type has been evolved, called the three-quarter floating, differing from the floating in that the drive axles are attached rigidly to the wheels, but, like the floating, carry no weight, the wheel bearings being external of the axle tubes. This seems to be the solution of the axle problem for medium-priced cars, as it possesses the principal advantages of the floating, with the cheapness and simiplicity of the semi-floating.

The Readers'

Reader Criticises Current Designing Practice—Suggests That Manufacturers Look to Users of Product for Practical Suggestions—Atwater Kent Circuit-Breaker

Bad Gearset Locations

Pennsylvania Motorist Urges Standardization of Controls and Ease of Removal

DU BOIS, Pa.—Editor Motor Age—Accessibility. That word to the owner of today contains much which is desirable in a motor car. The question is, are the manufacturers paying as much attention to the meaning of this word as they should? Automobiles are constructed more accessibly each year, the makers being spurred on by competition and the complaints registered by the owner-driver.

The manufacturer is unable to observe the working of his car or the comparison to other cars as the man who drives and repairs it. When an owner makes a suggestion the manufacturer should take sufficient interest to see whether he could better his product, and not discard the suggestion for the reason that the owner is not an engineer. Many business houses have suggestion boxes for their employees from which they get many excellent ideas. Is the automobile industry going to be an exception to this custom? The owner is the manufacturer's market, and if he fails in catering to his market it will soon go elsewhere to buy.

The more accessible car parts are, the easier, quicker and cheaper all repairs may be made; especially is this so if it is necessary to have them done in a garage. Work is charged by the hour in a garage, not by the piece. To illustrate: A car in which it becomes necessary to remove the transmission, one must first remove the body. This necessitates two or three hours of unnecessary work which could be avoided by the transmission being accessible. A great many cars have the unit power plant. In what one can you remove the clutch without first moving the gearcase and shaft, compelling the movement of three units to get one? We also have the semifloating axle, which is greatly inferior to the floating in accessibility. Of course, the semifloating is much the cheaper. Gearcases often are placed so far under the front seat that it is almost impossible to even look into them. Magnetos and distributers are placed so close to the dash that it is impossible to work on them without first removing them from the car. Water pumps are old offenders, and I wish to state an experience.

While on a trip, my pump filled with sediment, springing the safety catch on the pump shaft. Upon attempting to remove the pump I found the studs too long to allow it to slip over, but fortunately I carried a large tool kit and was able to cut them shorter, filing the threads back on. I presume the manufacturer neglected this point as engines are assembled outside the frame. Few drivers carry sufficient tools to complete this repair, and many would be unable to spare the time, even if they did, to do such work on the road, which should have been attended to in the designing or experimental rooms. These are the small things which disgust a car owner and are decidedly not accessibility.

I inquired of several high officials in a well-known factory the reason for placing a tire pump on the front of the gearbox instead of the rear. I was informed that they were not aware of any advantage in the rear position. The rear would be no less inaccessible for the pump than the front, and would be in the way of no other part. The same coupling could be used on the rear of the countershaft as the front. Yet with all this in its favor the pump was placed on the front. Now let me state that my clutch, before placing this tire pump, could be removed and replaced in 15 minutes, which now takes 45 minutes

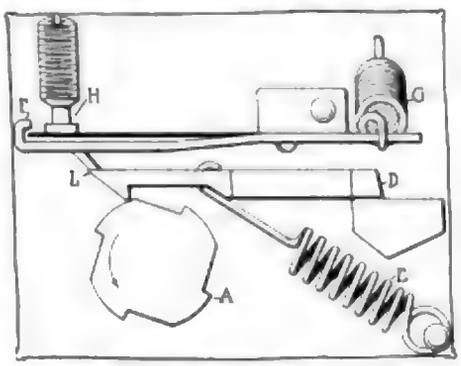


FIG. 2—ATWATER KENT CIRCUIT-BREAKER

Clearing House

Victim of Garage Ignorance Blames Maker for Giving Too Little Attention to Proper Instruction of Owners—Home Made Fire Extinguishers Not Successful

to remove, and the pump must come out also, whereas it would never be moved. I might add that it is necessary to remove this clutch quite often on account of trouble which is not common to just one car. Is this accessibility?

In another car the magneto being placed directly over the carbureter float chamber necessitated the magneto's removal before work could be performed on the carbureter. Another case of accessibility.

In a well-known car, to get access to the crankcase one must first remove the force-feed oiler and electric self-starter to be able to reach through the handholes.

In spite of a strong editorial in Motor Age a few years ago condemning the location of accelerators between the pedals, and also a campaign for uniform control, a well-known 1912 car has its accelerators in this position, bringing the pedals so close together that one must pinch his foot each time the clutch is released. A driver with a large foot would be severely handicapped in driving this car. The fault of course does not lie with the design but with the driver in possessing large feet. Is this accessibility or catering to the driver's wants?

I am sure a buyer would appreciate a small book of instructions on how to remove most quickly and easily each unit of a car without disturbing other units. In garages where they are not familiar with your car, and you yourself are not familiar with the easiest way of removing each part, this small book would be of great help and a saver of time, which means money.

I had a new car on a trip several years ago, and having broken a bearing in the gearbox, I took the car to a garage to have the broken parts removed. They first proceeded to attack the universal joint in two places, when one was sufficient. Next the start was made to remove the mud pan, which is the first part placed in the frame and the last to be removed. I stopped this, only to have them transfer their energies to removing the body. By this time I became thoroughly disgusted with their attempts to tear my car to pieces and at once sent for a factory road-man. I helped him with his work and in a very short time we had the gearbox out without removing another part, but it took us just twice the time to replace the parts that had been unnecessarily removed by the garage employees. This would all have been different if the manufacturers had furnished a small book of instructions, such as I have previously mentioned. As it was the manufacturer paid the expenses of his road-man, as well as supplying a bearing for the defective one. Several times in the last few years I have seen this same model undergoing repairs on the gearbox, and in nearly all cases the body was removed, when it is entirely unnecessary, and takes twice the time to make such repairs. In the whole these oversights are more costly to the manufacturer than to the owner. If it does not cost him money directly it will work against sales.

The manufacturer who caters more to the wants of the owners will have less trouble disposing of his product. Accessibility is my plea, and I wish all owners would join me.—W. J. Marlin.

Accessibility Is His Plea

Believes Car Should Be Adapted to Driver's Convenience—Simplicity Often Expensive

Effect of the Muffler

Cutout Gives But Little Increase in Power of Motor—Tests on Packard 30

LOWELL, Iowa—Editor Motor Age—Is the horsepower appreciably affected, and how, by the use of a muffler on a motor car?

2—Kindly give a formula by which this difference, if any, can be calculated, that is, if a muffler decreases the horsepower of the engine, how much, or if a cutout increases the horsepower, how may this increase be determined.—C. R. Waterman.

1—It depends very much upon the type of muffler employed and also to a certain extent upon the exhaust passages and general design of the motor. If the muffler is of an inefficient design, or has become clogged up, the back pressure of the exhaust gases and the mixing of the exhaust gases with the fuel in the combustion chamber is increased so that a more slow-burning and poorer mixture is obtained, consequently the power is cut down.

With a good muffler in first-class condition there is very little power lost as the result of back pressure, particularly at any but very high speeds. In the Readers' Clearing House of Motor Age for July 6, 1912, was published a curve showing the loss of power due to the muffler. This diagram was plotted from results obtained in testing mufflers employed on Rambler cars a few years ago.

A recent test conducted under the auspices of the Touring Club of America on a Packard 30-horsepower motor of stock pattern with the regular Packard muffler gave some very interesting results, all of them tending to show the very slight loss due to the muffler at ordinary speeds. In fact, the figures seem to indicate that there are some speeds at which the power of the motor was actually greater with the muffler cutout closed than with it open. The figures obtained from the test are in-

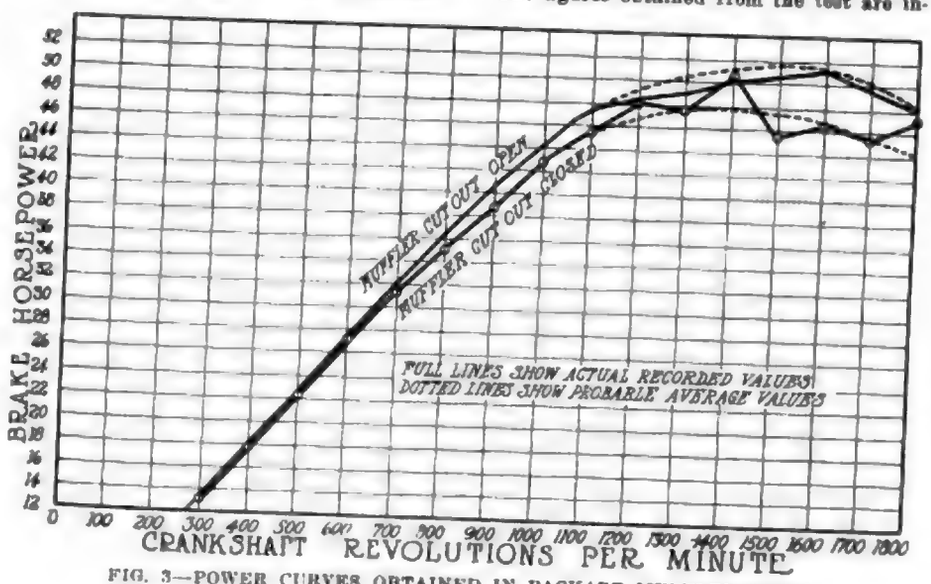


FIG. 3—POWER CURVES OBTAINED IN PACKARD MUFFLER TESTS

dicated below, from which is plotted the curve shown in Fig. 3.

Revolutions per minute	H. P. Closed cutout	H. P. Open cutout
300	13.37	13.60
400	17.98	17.83
500	22.28	22.69
600	26.97	26.97
700	31.73	32.00
800	35.05	36.57
900	38.40	40.46
1,000	43.05	41.91
1,100	45.66	45.26
1,200	48.00	45.72
1,300	47.50	48.53
1,400	50.13	50.13
1,500	45.72	50.29
1,600	46.32	51.20
1,700	45.33	48.57
1,800	47.32	48.00

2—There is no formula by which the effect of the muffler could be accurately calculated. An actual test would be the only method of determining it.

DOES NOT PULL UNDER LOAD

Lizton, Ind.—Editor Motor Age—I would like to have explained what is the trouble with my 1911 model AB Maxwell equipped with two cylinders, Splitdorf magneto, battery and planetary transmission. When the motor is running idle there seems to be nothing wrong,—it pulls well, never misses; advancing or retarding spark lever will cause motor to run faster or slower; transmission and gears are all right,—but when on the road it will not pull with any speed. I have looked for gasoline leaks from tank to cylinder but find none. Neither can I find any air leaks. The motor heats just a little more than it ought to but not enough to cause the water to boil much. The motor is set to fire on top dead center with spark retarded. I am inclined to think the carbureter is not right, yet I get a fine adjustment for motor running idle. It does not pull with any speed in either low or high; in reverse it does very well.—Subscriber.

The trouble probably is due either to weak compression or to binding somewhere in the transmission from motor to wheels. The latter can be tested for very easily by jacking up both rear wheels and turning them over with clutch out. If they turn easily, this part is all right. To test the compression, turn the motor over by hand and note the compression, or better, use a compression gauge. Loss of compression may be due to worn pistons or ill-fitting rings, or sticking valves.

OPERATION OF UNISPARKER

Council Bluffs, Ia.—Editor Motor Age—Can a wheel equipped with the old-style clincher rim be changed to a demountable rim?

2—If the above can be done is it then possible to use the clincher tire on the demountable rim?

3—What is the approximate cost if such a change can be made?

4—I recall seeing in Motor Age some time ago an article or two on demountable rims. Please refer to the issues in which these articles appeared.

5—In what rotation does the motor of a Buick model 10-1909 car fire? Was this model not placed on the market firing two different ways? I think this machine fires 1-3-4-2. Am I correct?

6—Please describe the mechanism of the Atwater Kent ignition system?—Amateur.

1—Yes.

2—Yes.

3—This depends on the type of demountable rim to be fitted.

4—Motor Age, January 11, 1912.

5—Firing order of Buick model 10 always has been 1-3-4-2.

6—The contact-maker is the special feature of the Atwater Kent system. It is this device, Fig. 2, that eliminates the old-fashioned vibrating coils. The contact-maker consists of a rotating shaft A which has notches or teeth cut for each cylinder—as many notches as there are cylinders. A lifter or pawl D rests against the notched shaft and this is pulled forward by the shaft as it rotates in the direction shown by the arrow. After the lifter or pawl has been pulled forward as far as the shaft will carry it, it is released and is pulled back to its normal position by the spring E. In returning it rides up over the notched shaft and the end of the lifter L bears for a brief instant against the projecting lip on the under side of contact arm F, throwing this over and closing the primary circuit at H. As the lifter instantly returns to normal position, the contact arm is pulled back by the contact arm spring G and the contact is broken so quickly that the eye cannot follow the various movements. The result is a single, hot, dynamic spark for each power impulse. This being produced mechanically, is positive and synchronous. The firing is uniform in all cylinders.

The production of a single spark at the exact moment when it is needed assures the long life of plugs, and the prolonged life of batteries, due to the decreased current consumption resulting. Six dry cells, giving about 8 volts are usually employed, though a 6-volt battery may be used.

SPECIFICATIONS OF RACERS

Stevens Point, Wis.—Editor Motor Age—Through the Readers' Clearing House will Motor Age give me the cylinder sizes, wheelbases, tire sizes of the Prince Henry Benz, Hotchkiss, Mercedes, Opel, Alco and Simplex cars? Also wether a T-head or valve-in-the-head motor is employed, and whether shaft or chain drive.—A Subscriber.

In the table below is all of the information regarding these cars that is at present available:

Carbureter Cork Floats

Source of Supply, Methods of Manufacture and Treatment—Claims of Superiority

DETROIT, Mich.—Editor Motor Age—What treatment is it customary to give cork used in the floats of carbureters, in order to properly fit it so as to prevent absorbing gasoline and so increasing in weight, and also prevent its being attacked by acids, small traces of which are often present in gasoline.—Carbureter.

The use of cork floats has been consistently followed in the Schebler carbureter, in which the floats are made of cork of the finer grades which is imported from Portugal and Spain, and is the bark from cork oak trees. The trees are over 40 years old before cork can be available for cutting, and the finer grades are taken from the third and subsequent cuttings. The cork can only be cut once every 8 to 10 years.

The cork is the first grade of over 150 different classes, and less than one-tenth of 1 per cent is available, owing to the severe inspection to which the cork is subjected. The reason that cork is especially adapted for carbureter floats is owing to its peculiar construction: Very firm and close in texture and composed of millions of tiny cells. Each one of these minute cells contains a bit of entrapped air, and each one is hermetically sealed by nature herself, and thus rendered impervious to air and moisture.

This peculiar cellular structure of cork has a double bearing on its value for floats on account of its low heat conductivity as well as permanent efficiency and durability. The floats are laminated and are made in from five to eight layers depending upon the size of the float and this form of construction insures additional buoyancy and durability.

The cork floats, it is claimed, are not affected by heat changes, either extreme of heat or cold, moisture, boiling gasoline, or any climatic or atmospheric conditions.

The floats are shellaced with the finest grade of pure shellac which is dissolved in pure grain alcohol. Each float receives three coats of shellac, which covers the surface sufficiently to add to their durability, making them additionally buoyant and suitable for the severe changes of temperature to which they are subjected.

The claimed advantages of cork floats are buoyancy, lightness and their heat, gasoline, acid, and sulphur-proof qualities.

STRUCTURAL FEATURES OF RACING CARS

Car	Bore	Stroke	Wheelbase	Drive	Valve location	Tires
Prince Henry Benz	4.1	6.5	.....	Chain	.....	....
Opel	4.5	6.9	128 inches	Shaft	Overhead	....
Mercedes	4.3	5.0	123 inches	Chain	Overhead	36x4
Simplex	5.1	5.7	124 inches	Chain	T head	36x5
Alco six	4.7	5.5	133½ inches	Shaft	T-head	....
Hotchkiss	4.4	5.9	.....	Shaft	.....	....

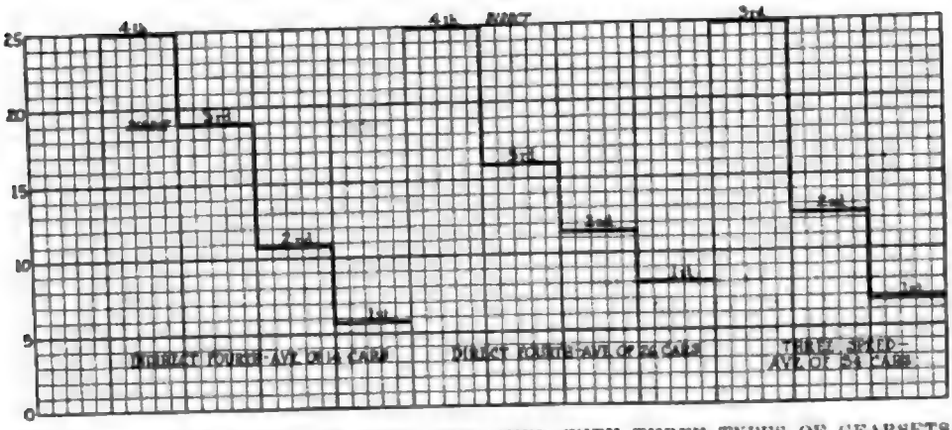


FIG. 5—SPEED IN MILES PER HOUR OBTAINED WITH THREE TYPES OF GEARSETS WITH AVERAGE GEAR RATIOS

If commercial extinguishers give good results, Motor Age would suggest that the life and property of South Dakota motorists be entrusted to those which are known to be efficient. As these are prepared from secret formulas, the secret comprising the stock in trade of the manufacturers, Motor Age is in no position to furnish them to its readers. These powders may be analyzed in any chemical laboratory, at a usual cost of $5 for each ingredient found. Samples to be analyzed may be sent to the Armour Institute of Technology, Chicago.

DIAMETERS OF VALVES

San Francisco, Cal.—Editor Motor Age—What are the diameters of the valves of the following cars: Maxwell Mercury roadster, E-M-F, Garford 30, 40 and 50, Peerless 38, 48 and 60?

2—What are the gear ratios of the following on first, second and third speeds of the Maxwell Mercury, E-M-F, all models of the Garford, and the Peerless 4-40.

3—What showing did the Henderson car make at the 500-mile speedway race this year?—G. B. Cox.

1—The diameter of the Maxwell Mercury valves is 1⅝ inch; the diameter of the inlet and exhaust valves of the E-M-F 30 is 1⅞ inch. The inlet and exhaust valves on the Peerless 38-Six, 48-Six, and 60-Six are the same diameters, namely 1¾ inch. On the Garford 30 and 50 the valve diameter is 2 inches and on the 40 it is $2\frac{1}{16}$ inches.

2—The following gear ratios apply to the Maxwell Mercury: First speed, 11.5 to 1; second, 9.1 to 1; and third, 3.5 to 1. The Garford is geared 3 to 1 on fourth speed and 3.5 to 1 on third or direct drive. The rear axle reduction is 3.25 to 1 on the E-M-F 30, 15 to 1 on reverse, 12 to 1 on first, 6.5 to 1 on second, 3.25 to 1 direct. The Peerless model H on first is 11.4 to 1; second, 6.2 to 1; third, 4.4 to 1. All gear ratios here are given between motor and wheels.

3—The Henderson was not entered in the 500-mile speedway race.

PENNSYLVANIA MOTOR LAW

West Monterey, Pa.—Editor Motor Age—I have an electric lighting system on my Ford car and am using a master vibrator. What is the cause of its occasionally flickering and almost dying out for a second?

2—Would it be necessary for me to get a driver's license to drive my father-in-law's car?

3—What are the laws in Pennsylvania in regard to signals or blowing horns at turns and crossing, also the different speed limits.—Burnel V. Barger.

1—Usually this is due to the motor speed becoming too low to permit the magneto to generate sufficient current for both lights and ignition.

2—Yes.

3—The state law of Pennsylvania prohibits the driving of motor vehicles at a rate of speed greater than 1 mile in 2½ minutes. All motor vehicles shall show 1 hour after sunset until 1 hour before sunrise at least two white lights, visible not less than 200 feet in the direction in which the motor vehicle is proceeding, and one red light visible in the opposite direction. The rear number tag must be illuminated. The law prohibits the passing of a street car when it has stopped to take on or let off passengers until the car has proceeded.

SALAMANCA DENIES IT

Salamanca, N. Y.—Editor Motor Age—In the last issue of Motor Age under the caption "From the Four Winds," is published an item informing motorists to "Beware of Salmanca," because of speed traps. As a member of the motor club of this town I can tell you that there has been no place where speed laws have been more openly violated and liberally interpreted. After the serious injury of several persons and after it became apparent that the "Please Drive Careful" and "Thank You" signs of our club were a waste of politeness the law was and is enforced with the approbation of almost all local motorists. Naturally a few of the worst old-time speeders were caught, some of them paid up and reformed, others, and one who is undoubtedly the source of the erroneous information, squealed.

Motorists are welcome in Salamanca, there are no speed traps and no one who drives with care will, or has ever, been arrested for violating the law.—W. Gibson.

Disagrees with Cameron

Correspondent Suggests Recourse to Four-Speed Gearset May be Step in Wrong Direction

CHICAGO—Editor Motor Age—Engineer Cameron's declaration in Motor Age for July 11 that American designers within a short time will adopt the four-speed gearset much more generally than formerly probably is correct. The increasing demand of owners for greater fuel economy and flexibility will force the makers to adopt the four-speed gearset in preference to the three-speed arrangement. Both in America and abroad, engineers have repeatedly pointed out the advantages of a slight increase in the final gear ratio, particularly in light cars, and practically all of them have held up the four-speed gearset as the least imperfect means to that end.

Admitting the manifest advantages of this type of gearset, which Mr. Cameron so clearly points out, does it not seem that the substitution of the four-speed gearset in cars at present employing the lesser number of speed changes, is treating a symptom rather than a disease? If motors as at present designed are lacking in efficiency and flexibility and reserve power for hill-climbing, would it not be better for the industry in the long run that the energy and expense entailed in designing special gearboxes be turned to improvement of the motor in these respects?

That such a change in the transmission members would require a comparatively heavy outlay, Mr. Cameron admits in the following statement: "The four-speed gearset has been confined to high-priced cars in America, primarily on account of prohibitive cost. It means a complete change of design—more gears, wider gear centers—a big expense for the improvement when all are totaled."

It is true that the four-speed gearset has found favor in Europe, for, as the writer pointed out, the horsepower tax, which over there is an appreciable item and which is based on the diameter of the bore alone, has led to the development of motors of very small bore. If small bores with increased stroke-bore ratios impair the flexibility of the motor to that extent, it would seem that the coming to America of the long-stroke motor is not the unmitigated blessing we at first supposed.

So far as four-speed gearsets are concerned, the contention that there are some advantages in the direct fourth not found in the indirect fourth probably is well founded, particularly when one considers the loss in efficiency due to the gears in high on the indirect fourth. Nevertheless exception might be taken to the statement that the use of the indirect fourth amounts in effect almost to the omission of one speed. Reference to Fig. 5 will serve to clarify the point. In this illus-

Four-Speed Gearsets

Chicagoan Believes Direct Drive on Third Speed Not so Bad as Michigan Engineer Says

tration, the speeds shown were based on the high speed of 25 miles per hour assumed by Mr. Cameron and the lower speeds calculated from the average gear ratios of a number of representative American cars for the season of 1912. Loss due to the gears was neglected in the calculation.

The first diagram in Fig. 5 shows the speeds of an average car at each speed combination for a car whose gear ratios are the average of those of fourteen cars with indirect fourth. These average ratios are:

First speed 10.5:1
Second speed 5.9:1
Third speed—direct—3.5:1
Fourth speed 2.6:1

The second diagram shows the speeds of an average car at each step of a direct fourth gearset whose ratios are the average of twenty-six American cars. These ratios average:

First speed 11.8:1
Second speed 6.7:1
Third speed 4.8:1
Fourth speed 3.2:1

The third diagram illustrates the speeds from a three-speed gearset whose ratios are the average of those of 43 cars. They are:

First speed 12:1
Second speed 7:1
Third speed 3.5:1

It will be noticed in Fig. 5 that the relative car speeds advance by more nearly equal steps in the average indirect fourth than in the direct fourth, although the speed steps of any car picked at random from the list of those with indirect fourths might show a reversal of this condition and give diagrams like those obtained by Mr. Cameron.

A study of the steps in the gear ratios themselves may throw some light on the subject. These are illustrated in Fig. 6, where the gear ratios of three cars in each class are plotted as well as the average ratios. It will be noted that there is very slight difference in the average steps with perhaps a shade in favor of the indirect as against the direct fourth. The jump between first and second in nearly every case is the noticeable feature.

Of the four gearsets plotted in each division, the first two were selected as being examples of extremes in each class, while the third was taken as being representative of nearly average practice. The fourth, as has been explained, is plotted from an average of the class.

These averages were calculated from the ratios of the cars listed below which are given herewith with the number of cylinders and rated horsepower. Neither the number of cylinders nor the power of the motor seems to have affected the design of the transmission system so far as the ratio between engine revolutions and rear wheels speed is concerned in the majority of cases. This is shown by the number of cars of the same make but with different numbers of cylinders or different power in which the same ratios are employed.—D. S. Hatch.

GEAR RATIOS OF SOME REPRESENTATIVE CARS

FOUR-SPEED DIRECT ON FOURTH

Car—	No. Cyl.	H.P.	1	2	3	4
Alco 40	4	44.1	10.4	[illegible]	4.2	3
Alco 60	6	44.1	10.4	6.8	4.2	3
American	4	46	13	6	4	3
Berkshire F	6	58.5	9.6	5.5	4.1	[illegible]
Chalmers 36	4	28.9	12	7	5.1	[illegible]
Chalmers 6	6	43.8	13	7	5.1	[illegible]
Flat 4	4	31.2	11.1	7.1	[illegible]	3.1
Flat 6	6	47	12.6	8.1	5.5	[illegible]
Locomobile L	4	32.4	14.2	6.8	5	[illegible]
Locomobile M	6	48.6	14.2	[illegible]	5	[illegible]
Locomobile 6	6	43.8	12.9	6.2	4.5	[illegible]
Moon 45	4	36.1	12.5	7.8	5	[illegible]
Oldsmobile 4	4	40	11.4	8	5.7	[illegible]
Oldsmobile 6	6	60	11.4	8	5.7	[illegible]
Palmer-Singer 46	6	38.4	11.6	7.1	5.2	[illegible]
Peerless D	4	25.6	14.8	[illegible]	6.2	4.1
Peerless J	6	38.4	12.9	7.2	5.3	3.6
Peerless H	4	40	11.4	6.2	4.4	3.2
Peerless K	6	48.6	11.4	6.2	4.4	3.2
Peerless L	6	60	11.4	6.2	4.4	3.2
Pierce-Arrow 36	6	38.4	12.8	7.4	5.4	3.3
Pierce-Arrow 48	6	48.6	12.6	7.1	5.4	3.3
Pierce-Arrow 66	6	60	10	5.8	4.5	2.7
Simplex 38	4	38	7.5	4.8	3.3	2.4
Simplex 50	4	53	8.6	4.2	2.8	2.1
White	6	43.8	10.6	6.8	4.5	3.1

FOUR-SPEED DIRECT ON THIRD

Car—	No. Cyl.	H.P.	1	2	3	4
Garford G 8	4	36.1	12.9	6.1	3.5	3
Garford G 14	6	43.8	12.9	6.1	[illegible]	3
Inter-State 50	4	40	9	6	3	2.5
Kissel 40	4	38	9.6	6.4	[illegible]	2.9
Kissel 60	6	48.6	[illegible]	6.4	[illegible]	2.9
Lozier 46	4	46	9	4.9	3.1	[illegible]
Lozier 51	6	51.6	9	4.9	3.1	[illegible]
Marquette 28	4	40	12	7	3.5	[illegible]
Palmer-S. 6-60	6	57	9.6	4.9	3.6	2.5
Stuyvesant	4	38	8.8	6	3.5	2.7
Winton	6	48.6	10.7	6	3.4	2.7
Morse D	4	34.3	9.4	5.3	3.4	[illegible]
Chadwick 19	6	60	9	4.5	3	[illegible]

THREE-SPEED GEAR RATIOS

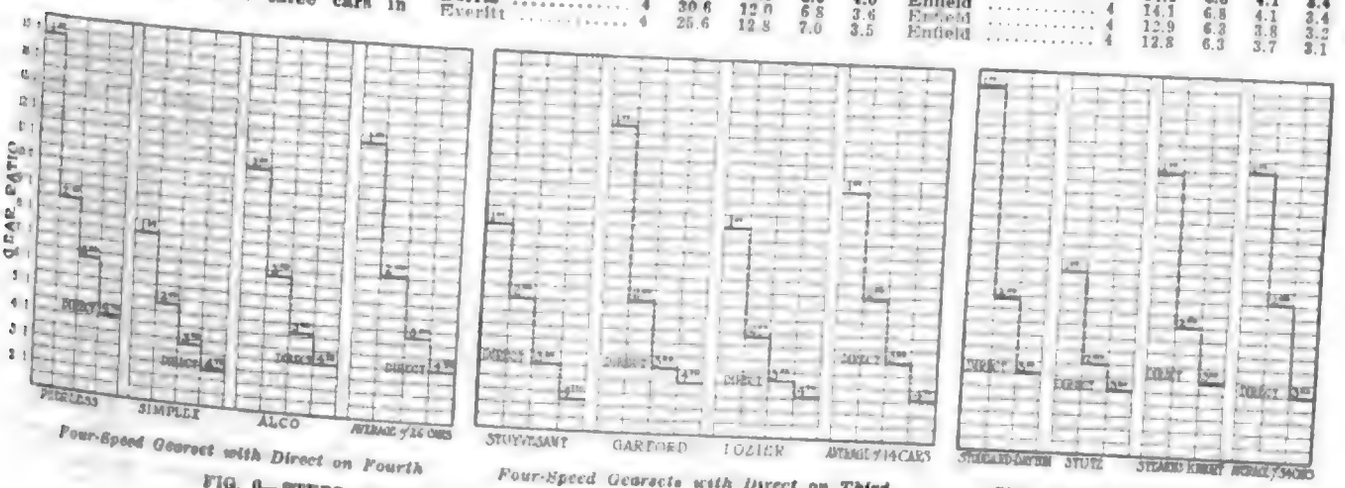
Car—	No. Cyl.	H.P.	1	2	3
American	4	22.5	10.5	6.4	4.1
American	4	32.4	10.2	5.6	3.2
Amplex	4	..	9.5	4.7	3.0
Berkshire	4	39.0	10.0	4.5	3
Cameron	4	24.0	[illegible]	4.5	2.5
Cameron	6	36.1	12.0	5.4	3.5
Cadillac	4	32.4	12.5	6.3	3.4
Chalmers	4	25.6	12.6	6.1	3.8
Corbitt	4	25.6	12.0	8.0	4.0
Dorris	4	30.6	12.0	6.8	3.6
Everitt	4	25.6	12.8	7.0	3.5
Everitt	6	38.4	12.8	7.0	3.5
Herreshoff	4	18.2	15.0	7.0	4.0
Hupmobile	4	16.9	[illegible]	[illegible]	[illegible]
Inter-State	4	32.4	9.0	6.0	[illegible]
Jackson	4	32.4	12.0	6.0	3.6
Maxwell	4	25.6	12.5	9.9	[illegible]
Maxwell	4	28.9	11.5	[illegible]	3.5
Midland	4	32.4	10.9	5.1	3.0
Midland	4	[illegible]	9.9	5.8	3.0
Moon	4	32.4	9.4	[illegible]	3.5
Moon	4	32.4	10.5	5.7	[illegible]
Ohio	4	32.4	14.6	8.0	4.0
R. C. H.	4	[illegible]	10.0	5.5	[illegible]
R. C. H.	4	16.9	11.0	6.0	4.0
Reo	4	25.6	11.4	6.2	3.7
Selden	4	36.1	11.3	7.1	3.5
Stearns-Knight	4	28.9	11.9	[illegible]	[illegible]
Stevens-Duryea	4	[illegible]	11.7	6.3	[illegible]
Stevens-Duryea	6	43.8	11.9	[illegible]	3.5
Stevens-Duryea	6	54.1	12.0	6.7	3.5
Stoddard-Dayton	4	35.6	14.9	[illegible]	4.1
Stoddard-Dayton	6	[illegible]	11.2	[illegible]	3.1
Stutz	4	36.1	8.0	4.6	3.5

EUROPEAN CARS WITH FOUR SPEEDS—DIRECT ON FOURTH

Car—	No. Cyl.	1	2	3	4
Alldays	6	11.4	5.6	[illegible]	2.8
Argyll	4	14.2	[illegible]	[illegible]	3.7
Armstrong-W	6	11.8	[illegible]	5.1	[illegible]
Arrol-Johnston	6	12.26	8.1	[illegible]	3.5
Austin	6	7.3	4.4	3.1	2.2
Berliet	4	8.8	6.25	4.5	3.0
De Dion-Bouton	8	15.42	9.42	6.21	3.7
Delaunay-Belleville	6	11.8	7.6	4.8	3.1
Hotchkiss	6	12.0	[illegible]	4.4	[illegible]
Daimler	4	12.7	6.8	4.42	[illegible]
Daimler	6	15.7	7.8	5.1	3.8
Lancia	4	12.3	7.5	5.1	3.1
Mercedes	4	12.8	6.3	4.2	3.0
Opel	4	11.0	6.5	4.0	3.0
Peugeot	4	12.0	7.0	4.0	3.0
Pilain	4	11.0	6.1	3.4	2.4
Renault	4	7.4	3.9	3.9	1.9
Renault	6	[illegible]	4.3	3.1	2.2
Wolseley	4	12.9	7.9	5.4	3.6
Wolseley	6	12.9	7.9	5.4	3.6

EUROPEAN CARS WITH FOUR SPEEDS—DIRECT ON THIRD

Car—	No. Cyl.	1	2	3	4
Ariel	4	13.3	6.5	[illegible]	3.2
Briton	4	8.5	5.8	5.8	3.5
Enfield	2	14.1	6.8	4.1	3.4
Enfield	4	14.1	6.8	4.1	3.4
Enfield	4	12.9	6.3	3.8	3.2
Enfield	4	12.8	6.3	3.7	3.1



Four-Speed Gearset with Direct on Fourth — *Four-Speed Gearsets with Direct on Third* — *Steps of Three-Speed Gearsets*

FIG. 6—STEPS IN GEAR RATIOS OF THREE DIFFERENT TYPES OF GEARSETS

Four Bridges Over the Ohio

Bridge at Louisville, Kentucky, 1929

Bridge at Cincinnati, Ohio, 1929

Bridge at Ashland, Kentucky, 1929

Bridge at Cairo, Illinois, 1929

The Ship Canal Bridge, Wi.

The Mathematics of Motoring

Gauging Gasoline Tanks

UNLESS there is a gasoline gauge connected with the fuel tank the quantity of fuel in it is usually a matter of guess work and many a motorist has found to his sorrow that he guessed wrong at a critical time. With rectangular tanks it is quite a simple matter to figure out the number of gallons for different heights of the liquid, so that by dropping a ruler marked in inches into the tank the quantity of gasoline can be told directly from the length of the wet portion.

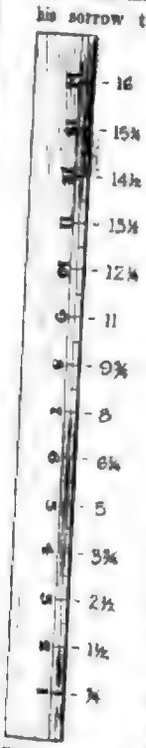


FIG. 1—HOW TO USE AN INCH RULE FOR MEASURING FUEL IN FORD TANK

For a rectangular tank, simply multiply the width in inches by the length in inches and then divide by 231. This will give the number of gallons of gasoline in the tank for each inch in height of the fluid, for there are 231 cubic inches in 1 gallon.

Cylindrical tanks cannot be scaled so easily, but with the aid of Fig. 2 the capacity of the tank for each tenth of the diameter can be figured if the total capacity is known and it is then only necessary for the motorist to arm himself with a stick marked in tenths of the diameter.

Similarly, one can graduate a stick to show the capacity of the tank in tenths by calculating the divisions from Fig. 3. The total volume of a cylindrical tank is found by squaring the diameter in inches, multiplying by the length in inches, then by .7854 and finally dividing by 231. A short cut is to use the table of areas of circles printed in this department last week. In case the diameter of the tank is greater than that shown in the table take half the diameter and multiply the corresponding area by 4.

Suppose we have a tank 16 inches in diameter by 24 inches long. We find in last week's table that the area of a circle corresponding to 8 inches diameter is 50.265 square inches. This multiplied by 4 is about 201 square inches.

$201 \times 24 = 4850$ cubic inches.

$4850 \div 231 = 21$, approximately, the number of gallons in the tank.

For the benefit of owners of Fords with the 16-gallon cylindrical tank, Fig. 1 shows how a 2-foot rule may be read directly in gallons.

In a horizontally disposed cylindrical tank the contents cannot be measured without the knowledge of certain geometrical relations existing between the height at which the liquid stands and the volume it occupies. These are given hereafter: 1st, In relation of volume to height; 2nd, In relation of height to volume.

V = total volume of tank;
v = volume occupied by liquid;
D = diameter of tank;
h = height of liquid in tank.

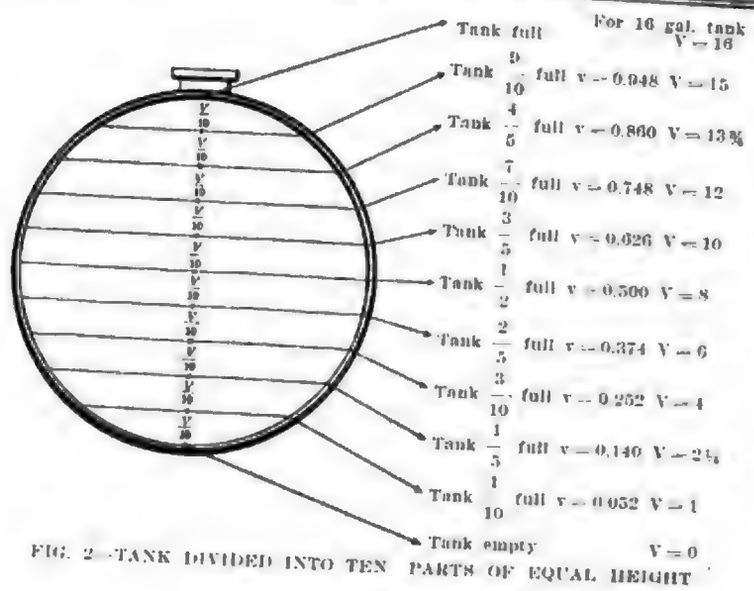


FIG. 2—TANK DIVIDED INTO TEN PARTS OF EQUAL HEIGHT

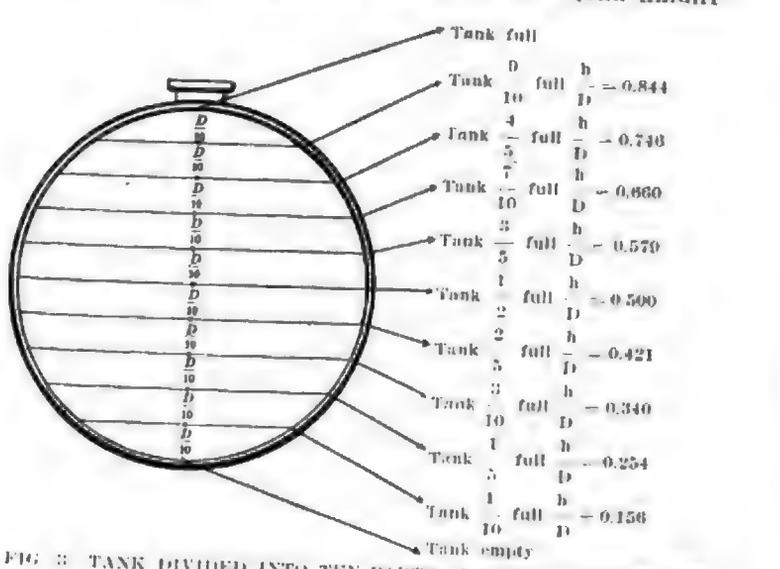


FIG. 3—TANK DIVIDED INTO TEN PARTS OF EQUAL VOLUME. FOR MAKING A GAUGE FOR A GIVEN TANK

TABLE OF APPROXIMATE CAPACITIES OF CYLINDRICAL TANKS IN GALLONS

1 gal.	2 gal.	3 gal.	4 gal.	5 gal.	6 gal.	7 gal.	8 gal.	9 gal.	10 gal.	15 gal.	20 gal.	25 gal.	30 gal.	35 gal.	40 gal.	45 gal.	50 gal.
5x12	6x18	6x24	6x36	6x42					8x48	10x48							
	7x12	7x18	7x24	7x30	7x36	7x42	7x48		9x40	12x34	12x42	12x50	12x60				
		8x15	8x18	8x24	8x30	8x36	8x42	8x45	10x32	14x24	14x30	14x38	14x44	14x52	14x60		
		9x12	9x15	9x18	9x24	9x30	9x34	9x36	12x24	16x18	16x24	16x30	16x36	16x42	16x48	16x54	16x60

Note—Dimensions are in inches, the first being the diameter and the second the length. Capacity appears at the top.

Tiger Kittens Cub Scouts

Ancient Egypt was a civilization of ancient northeastern Africa, concentrated along the lower reaches of the Nile River. Egypt is one of six regions in the world where writing developed independently. Egypt's ancient history is divided into a series of periods, beginning with the First Dynasty, which ruled from the city of Thinis in Upper Egypt

Comparing the Horse and Motor Truck

Figures Show that Service at 30 Cents Per Mile With Mechanical Hauling Costs 50 Cents When Brutes Furnish Power—Short Hauls Handicap Truck Efficiency

MANY persons who have been more or less surprised to see figures on the cost of operation of motor trucks running around 30 cents a mile, and have wondered how a firm can make a vehicle pay at such a cost, have never stopped to figure that it costs as high as 50 cents per mile to run horsed vehicles.

A two-horse vehicle carrying 3 tons as a load costs few users less than $6 a day for the service. Chicago department stores are paying as high as $7.12 for high-class teams, and the cost to the packing companies is about $6.15. For convenience say that a team costs in round numbers $6 per day.

Daily Work of the Horse

The day's work of a horse delivery truck does not average over 12 miles. Some firms do 15, but as a rule these change off their horses from day to day to give them a long route one day and a short one the next. A fair average is 12 miles per day.

With these figures as a basis, a 12 mile distance for a $6 cost, one quickly sees that the average cost of horse delivery by team is about 50 cents per mile at the present time.

This also gives a further clue to truck figures if we take a basis of $12 per day for a 5-ton truck. If this truck makes 40 miles per day it will be delivering at a cost of 30 cents per mile. If it does but 20 miles per day it will cost 60 cents per mile, and hence show a loss over horse equipment for the same work. This means that if delivery systems and loading arrangements keep the machine standing for any considerable length of time, so that but 30 miles a day can be accomplished, the truck will not be a success; but if it is so used with special systems for loading and unloading and for cutting out the idle moments so as to be kept actually in operation on the road for a maximum of time, then and then only can the machine pay dividends as against horse equipment so far as operating cost is concerned.

Short Hauls a Handicap

It is thus seen that a motor truck is at a disadvantage on short hauls, for with stops near together each stop will have to be short. Where motor trucks have been used successfully on such work there have been special systems and devices used such as dumping bodies and the like at the one end and hoppers for loading at the other, or there have been special conditions involved in the service.

As an example of the first case may be cited a certain lumber company using motor truck delivery for short hauls. This firm makes up the load on a separate wagon with rollers. When the motor truck arrives it is backed up to the dummy wagon and the load rolled off directly onto the motor truck, where it is locked. While the truck is delivering this load another load is being made up on the dummy wagon. At the other end the load is discharged by the rollers in the same way it was put on. With only a 5-minute delay at each end the truck is able to make enough mileage in a day to show a great saving over horsed wagons.

The J. T. McMillan Packing Co., of St. Paul, makes a motor truck pay on a short haul through another reason. This 3½-ton machine is used for hauling the products of the packing plant to the freight depots not quite a mile and a half away. The reason for the success of the motored machine over horses lies in the route over which they must pass.

Among the Hills

The packing plant is situated on the flats of the Mississippi river below the town, and to deliver to the railway yards a long and very steep hill must be climbed or, in the case of horses, a roundabout circuit of nearly a mile must be made. The motor truck takes the steep hill under full load without a murmur, thus saving considerable time over the horses which must go around. The difference makes for the comparative success of the truck. A quick-loading system combined with this makes the truck doubly successful.

While the daily mileage on this work is around 30, yet the comparative cost between this and horse-drawn trucks is less than would appear at first glance, as to accomplish the same work a horse truck would have to travel many more miles at its 50 cents a mile rate. In ten trips to the freight house the motor truck makes 30 miles, whereas for ten horse trips, adding an extra mile for each roundabout trip going and coming, 50 miles would have to be covered. It would thus take four teams to do the mileage delivery work of ten trips a day which the truck now handles.

This is a case where a direct mileage basis cannot be taken on account of the road conditions.

Another factor also enters into this work, for whereas on level streets loads of from 3 to 5 tons are handled by a two-horse outfit, in hilly places a wagon rarely takes 2 tons. Indeed in this hill trip for McMillan & Co., the average two-horse load is less than 2 tons and averages nearer a ton and a half. This on the long horse route. The motor truck, however, takes twice this amount on each trip, showing a further saving. On a basis of ten trips a day this would mean that the truck was doing the work of eight teams, figuring on a ton-mileage basis.

GIVING RAILROADS COMPETITION

A motor truck service for the shipment of freight and express consignments is soon to be conducted between Troy, N. Y., and Elmira, N. Y. The service company, which is to be incorporated with about $4,000 capital, will make daily trips between these points, receiving consignments along the entire route. The promoters of this proposed new motor truck service are of the opinion that a motor service can carry freight much cheaper than the rates now being charged by the various railroads. In the matter of shipping eggs from Troy to Philadelphia, Baltimore or Washington, the rate per case from Elmira is 11 cents less than from Troy, and after the installation of this new service Troy eggs will be shipped to Elmira before being sent to the larger cities.

PATROL DOES GOOD WORK

The work of a General Motors patrol which has been used by the city of Philadelphia in the outlying districts has aroused the interest of the city officials by the record made. During the past week the patrol made forty-seven trips, with 146 stops, and carried forty-eight prisoners, three persons to hospitals, one to the morgue, handled one motor cycle accident case and one motor car case, and made two trips for supplies.

Commercial Car

Chicago's Motor Fire-Fighting Rigs

Such Good Results Have Been Attained Already, it is Only a Question of Time Before Windy City Department Will Be Completely Motorized—Progress of Movement

IT IS only a question of time before Chicago will adopt motored equipment exclusively for all its fire department work. There are already fourteen motor vehicles in use by this department and through the favorable operation of these the further adoption of motored vehicles is contemplated. Most of these are motor cars for the use of the fire chief and assistants, but a number of motored chemical and squad wagons are in use and thirteen more are on order to be in service within 6 months, while there are two motored fire engines, one a steam machine with motor to drive it and the other a gasoline machine throughout with rotary pump driven direct from the motor.

Chicago's Motor Equipment

The motor cars are distributed as follows: Fire chief, two cars; first assistant, one car; second assistant, one car; third assistant, one car; fourth assistant and department inspector, one car; fifth assistant, one car.

At present there are 738 horses used by the department and nearly 300 vehicles.

The squad wagons when horse-equipped heretofore have been required to precede the fire engine by a limited distance—about 600 feet—but with the newer wagons, which, on account of their greater weight-carrying and speed proclivities, can carry a chemical engine of fair size and more men than with former horse wagons, they are allowed to get to the fire as speedily as possible and in nine cases out of ten have the fire out before the horse engine gets to the scene.

On one occasion wagon No. 13 arrived at the fire, put it out and started back, meeting the fire engine on the dead run, but a little over half way to the fire. A chemical engine of the size carried on these machines is sufficiently large to handle ordinary fires, and hence, with its speed, can prevent many fires from gaining headway which otherwise might within comparatively few moments get entirely beyond control.

This motored chemical and squad wagon has been in use 5 months. In this time it has made 115 runs, averaging 1½ miles each, with good success. The former horse wagons carried no chemical engine.

With horse equipment and steam engine it formerly took 10 to 15 seconds to get out of the barn; now with the motor it takes but 8-10 seconds. The former horse drivers are used for chauffeurs as knowing routes, and no one man is depended on for driving. Several of the men are capable of piloting the machine. The barn costs have been halved since the motor wagon was put in. But two horses are kept here now for emergency use with the steam fire engine, following the chemical. A motor fire wagon standing still costs nothing but interest on investment, while horses idle cost for feed, to say nothing of the expense of exercising, etc. Chicago realizes this and is looking toward an early adoption of more motored equipment.

Once in action speed is a primary object with the fire wagon or motored pumping apparatus, and hence many expense items which would be impossible on other fields are taken on here as a matter of course.

In the first place pneumatic tires are imperative for speed work. As runs are few and short—different from truck work—these are feasible and fitted in almost all cases. Detachable rims are used, of course.

Trucks Are High-Powered

With high speed a necessity, there is a greater horsepower in many cases over the average truck and a higher gear ratio in consequence. Nor is a governor fitted to the motor. If the machine were working day in and day out, pneumatic tires and high engine speed would be too costly, but with the work in spurts of speed at comparatively rare intervals these are demanded.

Again there is needed an unusual warning signal. Some use a siren, some a bulb horn, some a bell, and others an exhaust whistle. Still there is need for a more efficient warning and yet one that will throw the sound away and not deafen the men on the wagon.

Engine 102 uses an extra large bell, but this even when rung its loudest seems to be of little use, for it does not carry far enough ahead to allow for the speed of the fire apparatus.

The speed of the machine necessitates extra care in construction as well. Parts must be so related as to be readily accessible and the chemical apparatus readily usable.

Chicago's motored fire engines are two in number, as before stated. The first is at engine house No. 5 and is a steam machine with a motor to drive it; in other words, a steam fire engine on a truck chassis. Just why the two power plants are carried is not stated. This machine weighs 18,100 pounds. It has given good satisfaction, however, has given no trouble and has more than paid for itself in money saved the city since it was put into service 3 months ago. On one occasion by its quick arrival it saved a building on Adams street near Market, which, by a delay of a few minutes, would have been beyond control.

Handicapped Getting Up Steam

One trouble with this machine is in getting up steam on the way to the fire. The speed hinders the draught for the fire and the time is so short that sometimes it is hard to get a pressure by the time the scene of the conflagration is reached. The great weight of the machine is a disadvantage also. It is also, to use the words of the repairmen, "a man-killer for cleaning" after a run and hard to keep in trim. The engineer in charge was much opposed to having the motored engine put into his barn on the start, but was quickly won over by its excellent performances, so that now he is enthusiastically boosting for more motor equipment.

Engine 102 is a complete motor machine. This is fitted with a six-cylinder Thomas motor of 5¾-inch bore by 5½-inch stroke, rated at 70 horsepower. Capable of 60 miles an hour or over on the road, at the scene of the fire the motor is connected direct to the rotary pump and delivers as high as 700 gallons of water per minute.

On a recent call this machine made a special run to Evanston, a distance of 3 miles, in 5 minutes, connected up and pumped for 2½ hours continuously, forcing the water through 1,000 feet of hose and maintaining a pressure close to 200 pounds per square inch. The entire consumption for the trip and pumping was

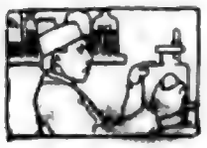
Ancient Ruins Found in Jungle

Archaeologists have discovered a vast network of ancient ruins in the jungle of Ravenshire. The ruins include temples, roads, and stone bridges. The discovery was made by a team of archaeologists from the University of Ravenshire.

The ruins are believed to be the remains of a city that was abandoned around 1500 years ago. The city was built by the Ravenshire people, who were a civilization that lived in the region before the arrival of the Spanish. The ruins are in a remarkable state of preservation, and the archaeologists have been able to map the entire city.

The team has been working in the jungle for three years. The work has been difficult because the jungle is very dense and the weather is very hot. The team has had to clear the jungle by hand in order to reach the ruins. The team has also had to deal with insects and snakes.

The discovery is expected to be very important for the study of the Ravenshire people. The archaeologists will now begin to study the ruins in more detail. They will also begin to excavate the ruins in order to find more artifacts.



Current Motor Car Patents

PATENTS ISSUED JULY 9, 1912

1,031,685—Pneumatic Tire. William H. Burritt, St. Louis, Mo. Filed August 26, 1911. Serial No. 646,197.

1,031,687—Spring Wheel. William N. Carroll and Julius C. Griffin, Nashville, Tenn. Filed April 25, 1911. Serial No. 623,286.

1,031,715—Apparatus for Lubricating Engines. James Horton and Thomas W. Keen, Munhall, Pa. Filed November 11, 1906. Serial No. 462,047.

1,031,718—Gas Turbine. Alexander T. Kasley, Swissvale, Pa., assignor, by mesne assignments, to the Colonial Trust Co., trustee, Pittsburgh, Pa., a corporation of Pennsylvania. Filed September 22, 1910. Serial No. 583,204.

1,031,723—Variable Speed Mechanism for Motor Vehicles. Thomas Lumsden, Gateshead, England. Filed July 26, 1911. Serial No. 640,-625.

1,031,729—Clutch. Stephen H. Pitkin, Akron, and Franklin Moeller, Cleveland, Ohio, assignors to the Wellman-Seaver-Morgan Co., Cleveland, Ohio. Filed September 21, 1910. Serial No. 583,081.

1,031,734—Grease Cup. Charles G. Ritter, Ludlow, Ky., and Jerome J. Aull, Cincinnati, Ohio, assignors to the Lunkenheimer Co., Cincinnati, Ohio, a corporation of Ohio. Filed August 5, 1908. Serial No. 447,044.

1,031,753—Mixer for Internal Combustion Engines or the Like. Walter C. Westaway, Belvidere, Ill. Filed June 30, 1911. Serial No. 636,315.

1,031,754—Internal Combustion Engine or the Like. Walter C. Westaway, Belvidere, Ill. Filed June 30, 1911. Serial No. 636,316.

1,031,755—Mixing Device for Internal Combustion Engines or the Like. Walter C. Westaway, Belvidere, Ill. Filed October 27, 1911. Serial No. 657,089.

1,031,759—Vehicle Supporting Device. George Westinghouse, Pittsburg, Pa. Filed October 15, 1910. Serial No. 587,214.

1,031,763—Wheel for Motor Vehicles. Frank C. Woodland, Worcester, Mass. Filed December 18, 1908. Serial No. 468,248.

1,031,785—Gas Engine Base. Edward J. Gulick, Mishawaka, Ind., assignor to the Simplex Motor Car Co., Mishawaka, Ind., a corporation of Indiana. Filed September 22, 1909. Serial No. 518,966.

1,031,809—Explosion Engine. Hans Mortzsch, Detroit, Mich., assignor to Mortzsch and Klee, Detroit, Mich., a partnership. Filed May 9, 1908. Serial No. 431,957.

1,031,822—Wheel. Henry V. Snell and John Callan, Globe, Ariz. Filed July 13, 1911. Serial No. 638,085.

1,031,825—Motor Car Fore Carriage for Vehicles. Gustave Emile Noe Isidore Ernest Subra, Fontenaysous-Bois, France. Filed October 12, 1910. Serial No. 586,617.

1,031,831—Vulcanizer. Frank W. Bacon, Omaha, Neb. Filed October 3, 1911. Serial No. 652,654.

1,031,856—Tire. Frederick G. Kollenberg, Owensboro, Ky., assignor to Elmer Little, Owensboro, Ky. Filed July 13, 1911. Serial No. 638,373.

1,031,882—Driving Gear for Electrically Actuated Trucks or Rail Cars. Walter J. Spangler, Philadelphia, Pa., assignor of one-half to Russell Thayer, Philadelphia, Pa., and one-fourth to Richard M. Elliot, Bryn Mawr, Pa. Filed February 21, 1911. Serial No. 610,079.

1,031,891—Vehicle Wheel. Irett F. Tucker, Sumner, Mich. Filed October 27, 1910. Serial No. 589,296.

1,031,908—Starting Device for Explosive Engines. James A. Brown and Carl G. Bosch, Cedar Rapids, Iowa, assignors to Bosch-Rhea Co., Cedar Rapids, Iowa, a corporation of Minnesota. Filed May 18, 1911. Serial No. 627,-969.

1,031,921—Wheel. Edward Bates Franzheim, Wheeling, W. Va. Filed December 22, 1911. Serial No. 667,390.

1,031,933—Vehicle Wheel. Ludia H. Hodges, Silverton, Texas. Filed December 21, 1910. Serial No. 596,800.

1,031,943—Silencer. Alfred Lloyd Horry, San Francisco, Cal., assignor of one-half to Horace Otto Little, San Francisco, Cal. Filed September 18, 1911. Serial No. 649,797.

1,031,972—Metallic Wheel Rim. Olaf T. Svensen, Davenport, Iowa. Filed November 10, 1911. Serial No. 659,517.

1,031,983—Core for Manufacturing Pneumatic Tire Shoes. Wilbur T. Childs, Akron, Ohio, assignor of one-half to Franke Nolte and one-half to Martin D. Kuhlke, Akron, Ohio. Filed July 29, 1910. Serial No. 574,582.

1,031,988—Variable Speed Device. Edmond Draullette, Paris, France. Filed May 11, 1910. Serial No. 560,757.

1,031,991—Internal Combustion Engine. George M. Fairchild, San Antonio, Texas. Filed January 9, 1912. Serial No. 670,290.

1,031,993—Signaling Mechanism. Claud H. Foster, Cleveland, Ohio. Filed November 3, 1909. Serial No. 525,992.

1,032,001—Spring Wheel. Howard M. Hanna, Jr., Herbert E. Wetherbee, and Richard F. Grant, Cleveland, Ohio. Filed September 23, 1910. Serial No. 583,507.

1,032,003—Transmission Mechanism for Motor Cars. Edward M. Heylman, Janesville, Wis. Filed February 17, 1909. Serial No. 478,434.

1,032,064—Vehicle Wheel. Lawrence Hoskins, Plainville, Ill. Filed February 6, 1911. Serial No. 606,908.

1,032,068—Driving Mechanism for Electrically Propelled Vehicles. John Krohn, Chicago, Ill. Filed August 24, 1910. Serial No. 578,798.

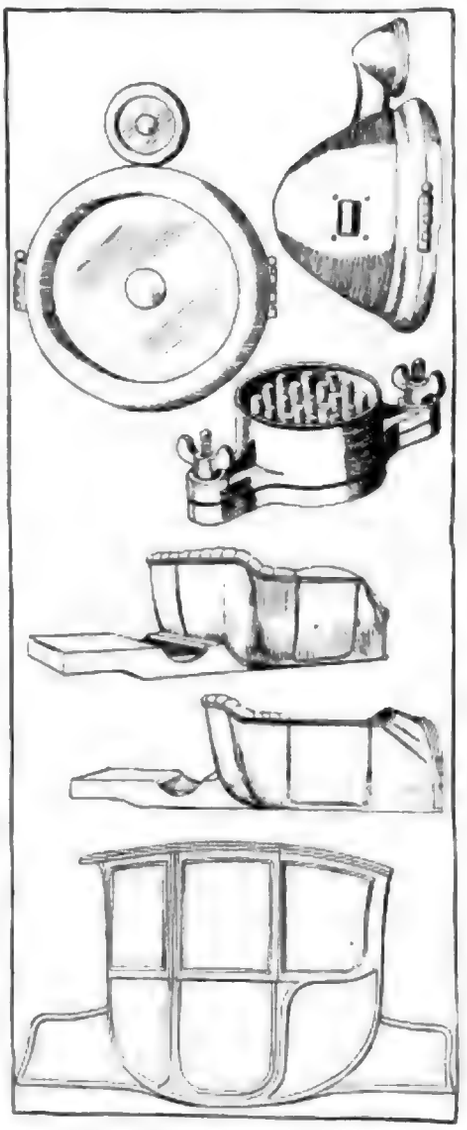
1,032,099—Sparking Plug for Internal Combustion Engines. Arnold Zahringer, Stuttgart, Germany, assignor to the firm of Robert Bosch, Stuttgart, Germany. Filed November 15, 1909. Serial No. 528,192.

1,032,118—Motor Plow. Otto Czaran, New York, N. Y. Filed September 20, 1911. Serial No. 650,372.

1,032,120—Propeller for Motor Car Sleighs. Marie Antoine Jean de La Besse, Paris, France. Filed March 7, 1911. Serial No. 612,938.

1,032,125—Vehicle Wheel. Farnum F. Dorsey, New York, N. Y., assignor to Amos Woeber, Davenport, Iowa. Filed February 29, 1908. Serial No. 418,462.

1,032,154—Acetylene Gas Generator. William Hartledge Parker, Toronto, Ontario, Canada. Filed November 23, 1910. Serial No. 593,928.



C. M. HALL CO.'S LAMP DESIGN
ADAMSON VULCANIZER
CHALMERS BODY DESIGN
FRITCHLE BODY DESIGN

1,032,158—Electrode for Secondary Galvanic Cells. Henrich Paul Rudolf Ludwig Porsche and Julius Adolph Erwin Achenbach, Hamburg, Germany. Filed May 1, 1911. Serial No. 624,-358.

1,032,163—Machinery Shafting. William J. Stewart, Jr., Beaver, Pa. Filed August 15, 1910. Serial No. 577,222.

1,032,168—Change-Speed Gearing. Addison G. Waterhouse, New York, N. Y. Filed October 10, 1911. Serial No. 653,962.

1,032,171—Internal Combustion Engine. Lyman Woodworth, San Francisco, Cal. Filed May 17, 1911. Serial No. 627,823.

1,032,179—Clutch Mechanism. Richard Wilkinson Bateman and Loftus Hanson Bateman, Leeds, England. Filed December 27, 1910. Serial No. 599,344.

1,032,185—Signaling Device for Motor Cars. Edward T. Burrowes, Portland, Me. Filed November 24, 1909. Serial No. 529,776.

1,032,203—Electric Gas Lighter. Harold Duncan Grinnell, Pittsfield, Mass. Filed July 20, 1911. Serial No. 639,643.

1,032,214—Vehicle Spring. George M. Huston, New York, N. Y. Filed April 3, 1912. Serial No. 688,326.

1,032,240—Gasoline Filter. Charles A. Port, John E. O'Neal and Dorace E. Motz, Pagosa Springs, Colo. Filed April 10, 1912. Serial No. 689,883.

1,032,261—Differential Gearing. Elmo L. Wright and Thomas M. Blossat, Jr., LaFayette, La. Filed October 20, 1911. Serial No. 655,-825.

1,032,283—Fluid Clutch. William W. Henderson, Washington, D. C., assignor to Hydraulic Clutch Drive Co., Washington, D. C., a corporation of Delaware. Filed October 12, 1910. Serial No. 586,773.

1,032,307—Carbureter. Alfred C. Stewart, Los Angeles, Cal. Filed July 31, 1911. Serial No. 641,654.

1,032,309—Headlight Adjuster for Motor Vehicles. Pembroke N. Squires, Canon City, Colo. Filed August 5, 1911. Serial No. 642,498.

1,032,335—Vehicle Spring. George M. Huston, New York, N. Y. Filed April 18, 1912. Serial No. 691,651.

1,032,350—Transmission Gearing for Motor Vehicles. Gustave Dumont, Neuilly-sur-Seine, France. Filed February 15, 1909. Serial No. 478,122.

1,032,361—Lubricator. James Horton, Munhall, and Thomas W. Keen, Swissvale, Pa. Filed February 9, 1912. Serial No. 676,491.

DESIGNS

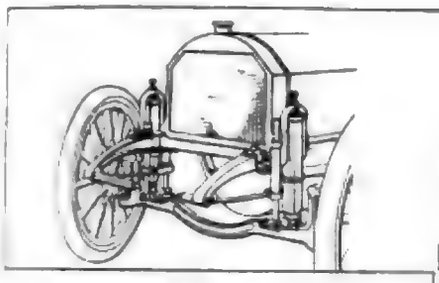
42,721—Portable Vulcanizer. Cecil F. Adamson, East Palestine, Ohio. Filed April 4, 1912. Serial No. 688,552. Term of patent 14 years.

42,724—Lamp. William F. Anklan, Detroit, Mich., assignor to C. M. Hall Lamp Co., Detroit, Mich., a corporation of Michigan. Filed April 18, 1912. Serial No. 691,751. Term of patent 14 years.

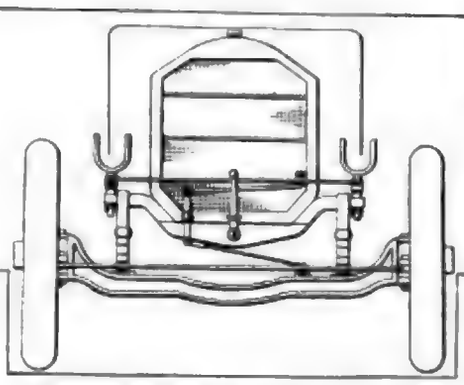
42,732—Motor Car Body. George W. Dunham, Detroit, Mich., assignor to Chalmers Motor Car Co., Detroit, Mich., a corporation of Mich. Filed September 18, 1911. Serial No. 650,059. Term of patent 14 years.

42,738—Motor Car Body. Oliver P. Fritchle, Denver, Colo., assignor to Fritchle Automobile and Battery Co., Denver, Colo., a corporation of Colorado. Filed March 18, 1912. Serial No. 684,623. Term of patent 14 years.

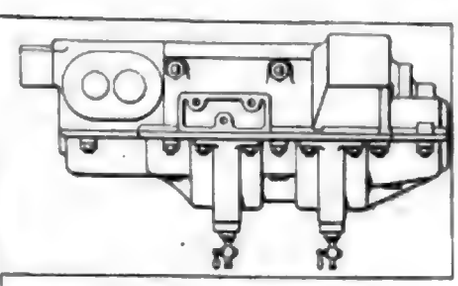
CARBURETER—No. 1,032,307. Alfred G. Stewart, Los Angeles, Cal. Filed July 31, 1911, dated July 9, 1912. Of the float-feed type, this carbureter consists of a float chamber, with a cork float, and a needle supply valve. The feed to the mixing chamber is through a vertical stand-pipe. This stand-pipe forms the valve stem of a cone-shaped air-valve, and communicates with the mixing chamber through an inverted needle valve, flexibly suspended from the top of the mixing chamber. The air valve, in raising in response to the suction of the engine, admits more air, and raises the seat of the nozzle valve, which is integral with itself, away from the suspended nozzle valve, admitting a corresponding increase



WESTINGHOUSE SUSPENSION



SQUIRES' DIRIGIBLE LAMP BRACKETS



AMPLEX CRANKCASE

of gasoline vapor. The nozzle valve is adjustable, as is the seat. An auxiliary nozzle-jet leads at right angles to this valve, which discharges the gasoline sideways when the air-valve is opened fully, closing the normal jet at its top.

Spark Plug—No. 1,032,099. Arnold Zähringer, Stuttgart, Germany, assignor to the firm of Robert Bosch, Stuttgart, Germany. Filed, November 15, 1909, dated July 9, 1911. This plug consists of a porcelain insulator, within a steel shell, being retained by a metal bushing threaded to the shell, within which is a sleeve, surrounding an axial electrode. The outer shell is dome-shaped at its lower end, and provided with a small hole, and serves as the ground electrode. The central electrode is adjustable, so as to vary the width of the spark gap, and is retained by a cap nut provided with a split-binding washer, which in conjunction with the cap nut, serves as a means of adjusting the central electrode.

Headlight Turning Device—No. 1,032,309. Pembroke E. Squires, Canon City, Colo. Filed August 5, 1911, dated July 9, 1912. For the purpose of turning the lamps of a motor car, to correspond with the turning of the front wheels, this device consists of oscillating lamp brackets controlled by a tie-rod, connected to a vertical cross-tree, by a rod. To this cross-tree a corresponding rod leads to the connecting rod of the steering gear of the car.

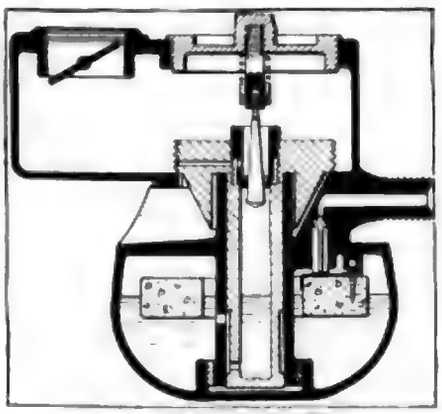
Vehicle Supporting Device—No. 1,031,739. George Westinghouse, Pittsburgh, Pa. Filed October 15, 1910. Dated July 9, 1912. This patent relates to a device to take the place of springs on a vehicle, primarily intended for motor cars. The device consists of vertical telescopic pneumatic cylinders bolted rigidly to the body frame. These cylinders are placed at the four corners of the frame, directly over the axles, and are pivotally connected to them. The frame of the vehicle is of the standard motor car type, having projecting horns extending beyond the axles. To these horns are pivoted radius rods, which preserve the proper relation between the frame and the axle, being connected to a small tubular guide, parallel to the cylinder, having a parallel rod pivoted to the axle, within it. The cylinder is so pivoted at its head and the guide rod so pivoted at its base that a limited lateral movement is permitted, to allow for endwise tilting of the axle.

Grease Cup—No. 1,031,734. Charles G. Ritter, Ludlow, Ky., and Jerome J. Aull, Cincinnati, Ohio, assignors to the Lukenheimer Co., of Cincinnati, Ohio. Filed August 5, 1908, dated July 9, 1912. Consisting of two shells, one within the other, this grease cup offers the improvements of instant adjustment and an automatic locking feature. The outer shell is the lower, being adapted to screw into the part to be lubricated, and being internally threaded to receive the inner and upper shell, which is provided with a flange to overlap the upper edge of the outer shell. A piston operates within this shell, and is provided with a spring to provide constant pressure. The flange of the upper shell is provided with a spring plunger to engage a slot in the edge of the lower, which constitutes the locking feature. This plunger or catch is released upon unscrewing the cap by means of a projecting lip.

Gas Engine Base—No. 1,031,785. Edward J. Gulick, Mishawaka, Ind., assignor to the Simplex Motor Car Co., Mishawaka, Ind. Filed September 22, 1909, dated July 9, 1912. Designed for a two-cycle engine, this crankcase consists of two halves, an upper and a lower, the center of which is a crank chamber, and the sides or ends of which are gas-trapping chambers. These chambers are counter-bored on one side, and fitted with crank-shaft journals, with annular packing strips at their ends. Oil ducts lead from these journals to the crank chambers, and flanges fitted to the main journals engage the counter bores of the crankcase.

Three More Blue Books Ready

THE Automobile Blue Book is now complete in a series of five volumes. Volumes 4 and 5 already have been reviewed in these columns. Following closely their appearance came the first three numbers. Volume 1 not only covers New York state and southern Canada, but in addition gives a great deal of important data on the border territory, particularly east of the Hudson river and Lake Champlain, and in New Jersey and Pennsylvania. The 1912 edition does not show so much of an increase in scope of territory covered but the scenic sections of the central part of the state and the Catskill and Adirondack mountains have been more thoroughly covered than ever before. Old routes have been checked up and new ones added in sections heretofore not so comprehensively covered. Data in each section in this volume also has been carefully compiled with reference to historic and other interest.



STEWART CARBURETER

Volume 2, covering New England and eastern Canada, has been materially improved, not only by adding many new routes in territory heretofore covered, as well as checking up the old routes, but extensions have been made to take in the maritime provinces of Canada, bordering on northern New England, which section has been given special attention. This territory offers many attractive trips heretofore unknown to the tourist.

Volume 3, covering Pennsylvania, New Jersey and the south contains nearly 40,000 miles of complete route data. The scenic sections of New Jersey and Pennsylvania have received particular attention in the matter of new routes. In addition to this, the work in the South Atlantic states has been materially extended. The data in this volume in the section bordering that which is treated in volume 4 makes maps and routing continuous, permitting no break in directions between this and the territory covered by volume 4.

Lectures Now a Lesson Of Nature

Dr. Ernest Lawrence, 1939 Nobel Prize winner in physics, and Dr. Arthur H. Compton, 1927 Nobel Prize winner in physics, are pictured in the Radiation Laboratory at the University of California, Berkeley, where they are now giving lectures on the nature of the universe.

Dr. Lawrence and Dr. Compton are pictured in the Radiation Laboratory at the University of California, Berkeley, where they are now giving lectures on the nature of the universe.

Brief Business Announcements

Recent Agencies Appointed by Car Manufacturers

Town	Agent	Make
Amsterdam, N. Y.	W. M. McCaffrey	Cole
Aurora, Ill.	C. C. Hinckley	R. C. H.
Baltimore, Md.	Snaffer Mfg. Co.	R. C. H.
Baltimore, Md.	Sanders Machine Shop	Detroiter
Bay City, Mich.	Miller Auto Co.	R. C. H.
Bethany, Mo.	Bert L. Layson	R. C. H.
Breymer, Mo.	A. Wells & Co.	R. C. H.
Camden, N. J.	Yale Motor Co.	R. C. H.
Canby, Minn.	C. M. Anderson	Cole
Castle, N. Y.	Cook Brothers	R. C. H.
Chicago	Victor F. Michelson	R. C. H.
Cincinnati, O.	Olds-Oakland Motor Co.	R. C. H.
Conneautville, Pa.	Penn Auto Co.	R. C. H.
Cornell, Ill.	J. H. Reichart & Co.	R. C. H.
Dansville, N. Y.	Willard Morris	R. C. H.
Des Moines, Ia.	Sears Automobile Co.	R. C. H.
Drayton, N. D.	Drayton Auto Co.	R. C. H.
Duluth, Minn.	Woods Brothers	R. C. H.
Dunkirk, N. Y.	Henry Schafer	R. C. H.
Elmira, N. Y.	F. E. Wickwire	R. C. H.
Fargo, N. D.	John Wyman	Cole
Frederick, Okla.	H. Ohlendorf	R. C. H.
Freeport, Ill.	Morris & McHugh	R. C. H.
Goldsboro, N. C.	W. A. Blackburn & Co.	R. C. H.
Hamburg, Ia.	George Grape	Cole
Hartford, Conn.	Walter J. Connelly	R. C. H.
Hazleton, Pa.	Smith Motor Car Co	R. C. H.
Hiram, O.	Vincent & Hurd	R. C. H.
Hornell, N. Y.	Peters and Kittell	R. C. H.
Houston, Tex.	Worthrup & Clark	R. C. H.
Jackson, Mich.	G. A. Weber	R. C. H.
Jamestown, N. Y.	Slawson & Launsberry	R. C. H.
Lexington, Ky.	R. E. Graybill	Cole
Lynchburg, Pa.	Model Garage	R. C. H.
Malta Bend, Mo.	Cole Brothers	R. C. H.
Manila, R. I.	R. N. Clark	Cole
Maple Park, Ill.	A. A. Marvin Son & Co.	R. C. H.
Marine City, Mich.	W. H. Mannell	R. C. H.
Medina, N. Y.	Charles Dye	Cole
Mendota, Ill.	Their & Gehant	Franklin
Minneapolis, Minn.	A. F. Chase & Co.	Havers
Moose Jaw, Can.	Percy D. Shand	Cole
Moro, Ore.	W. H. Moore	Cole
Morris, Minn.	Olson-Hemming Auto Co.	R. C. H.
Mt. Pleasant, Mich.	B. E. Graham & Co.	R. C. H.
Nehawka, Neb.	V. P. Sheldon	Cole
Norwich, Conn.	F. O. Cunningham	Franklin
Newport, Pa.	W. L. Reisinger	R. C. H.
New Canaan, Conn.	Central Garage Co.	R. C. H.
New Philadel'a, O.	O. W. Smith	R. C. H.
New York	Central Motor Car Co.	R. C. H.
Niles Center, Ill.	Niles Center Garage Co.	R. C. H.
Palatine, Ill.	Heckbarth & Schering	R. C. H.
Pasadena, Cal.	Muncie Motor Co.	R. C. H.
Rensselaer, Ind.	John M. Knapp	R. C. H.
Raleigh, N. C.	Capitol Motor Car Co.	R. C. H.
Richmond, N. Y.	I. A. Silvis, Jr.	R. C. H.
Southampton, N. Y.	William H. Hedges	R. C. H.
Sterling, Ill.	E. L. Warneke	R. C. H.
St. Paul, Minn.	White Bear Auto Co.	R. C. H.
Traverse, Minn.	John A. Johnson	R. C. H.
Troy, N. Y.	James N. Bussey	R. C. H.
Viola, Ill.	Worley & Terrey	R. C. H.
WallaWalla, Wash.	Moore Automobile Co.	Cole
Washington, N. C.	Dalley Motor Co.	R. C. H.
Westpoint, Neb.	W. H. Kehoran	Cole
Whitakers, N. C.	W. T. Hearne	R. C. H.
Wilmington, N. C.	Wilmington Auto Repair Co.	R. C. H.

BALTIMORE, Md.—The agency for Zilio is now in the hands of H. F. Parker & Co., 633 West North avenue.

Akron, O.—The Akron Rubber Mold and Machine Co. has just increased its working capital from $10,000 to $30,000.

Syracuse, N. Y.—The American-Cole Sales Co., of Syracuse, which handles American and Cole cars, has moved into the new salesroom at 636 South Salina street.

Baltimore, Md.—Essenkay tire-filler is now being handled in this territory by the Essenkay Sales Co. of Maryland, including Maryland and the District of Columbia. Clarence H. Clark is the local manager and his headquarters are at 2 East North avenue, in the Casino building.

Dallas, Texas—In preparation for the establishment of a branch house in Dallas, S. J. Kuqua, vice-president of the Cole Motor Co., is in Dallas for a few weeks. His branch here will be the only one in Texas and will be used as the distributing point of the south. Plans for a modern garage are under way in connection with the distributing house.

Boston, Mass.—Wallace C. Hood, formerly sales manager of the Everitt, has joined the firm of J. S. Harrington & Co., New England agents for the Everitt. He will have general charge of sales and distribution from the Boston, Worcester and Providence salesrooms, making his headquarters in Boston. The company has just ordered constructed a new service station on Bickerstaff street, Boston, which will be ready about August 1. D. A. Harrington will take charge of the retail department at the Boston office.

McClure, O.—J. M. Connolly has sold the McClure garage, located at McClure, to John Harmon. Mr. Connolly will move to Red Lodge, Mont.

Detroit, Mich.—The E. R. Wagener Co., Syracuse, N. Y., maker of castings and die cast bearings, has opened a sales office in this city, with H. J. McCallam, Jr., in charge.

Omaha, Neb.—The organization of a new Omaha company was completed last week. It will be known as the Apperson Jack Rabbit Auto Co., handling the Apperson.

Chicago—The R. C. H. Co. has completed arrangements for the construction of a new branch and service station in Chicago. The building will be a two-story structure, 50 by 175 feet, located at 2436 Michigan avenue. Negotiations are being consummated for the construction of similar buildings in New York, Philadelphia and Boston.

Baltimore, Md.—A new idea which will prove pleasing to owners of Hudson cars in this city and state has been adopted by Louis E. Lambert, of the Lambert Automobile Co., Hudson dealer in this city. He has leased the property known as Round Bay for the season. This is a former summer resort and Mr. Lambert's purpose is to afford a place for Hudson owners where they can spend the day with their families and friends and enjoy good bathing, boating, fishing and crabbing. Round Bay is situated on the picturesque Severn river.

Newark, O.—The Licking Motor Car Co., of Newark, has closed a contract with the Republic Tire and Rubber Co. to handle Republics in the Newark territory.

Cincinnati, O.—The Imperial Motor Car Co., Cincinnati, representative for Cole and Stearns cars, has moved into a new service building and salesroom at 1609 Madison road. It also will retain its old location at Peebles corners so that it will be able to serve owners from two service points.

Wichita, Kan.—The Baldwin-Smith Motor Truck Co., located at 115 East Second street, has been organized for the purpose of handling commercial motor trucks in Wichita and vicinity. It has closed a contract with the Lincoln Motor Car Works, of Chicago, whereby it becomes distributing agent for the Lincoln light delivery wagons.

West Allis, Wis.—The West Allis Machinery and Auto Co. has been established at 686-690 Seventy-third avenue, to conduct a garage and large machine shop. At the head of the business is Joseph W. Moore, superintendent of shop No. 4 of Allis-Chalmers Co., West Allis. Andrew Beaulieu will be general manager and with him will be associated Frank Meier, Joseph Holut and James McCue, all formerly associated with the Allis works. It is reported that the company intends to build

under the name of the Shafer-Decker Co. Frederick J. Decker is the new partner in the Rochester Cole organization.

Portland, Me.—Clarence E. Eaton, T. L. Croteau and Albert F. Jones have formed the Universal Motor Truck Co. at Portland to handle that make there.

Westfield, Mass.—The Westfield Motor Truck Co. has been organized at Westfield with Walter F. Mogill president, Ernest L. Hull treasurer, and Henry W. Hallbourg secretary.

Spokane, Wash.—J. O. Stewart is the newly appointed manager of the Spokane branch of the Diamond Rubber Co. Mr. Stewart succeeded W. J. Voit, who removed to Los Angeles.

New Haven, Conn.—The Knight Garage, Inc., 257-263 George street, has secured the Thomas for this county as its leader and contemplates adding a large fireproof addition to its present quarters.

Boston, Mass.—A new service station four stories high and 90 by 50 feet is being erected on Bickerstaff street, Boston, for the local agency for the Everitt car. It will be ready about August 1.

New Haven, Conn.—The new garage being built for W. A. Kirk at New Haven will be the largest one in the state, according to the builders, the structure being four stories high, with 40,000 square feet, and having a capacity for 250 cars. A 10-ton elevator will be installed to carry the cars up and down. The structure is of brick and reinforced concrete.

Akron, O.—The Akron Rubber Mould and Machine Co. has filed papers with the secretary of state increasing its capital stock from $10,000 to $30,000.

Detroit, Mich.—J. A. Thorsen, advertising manager of the Lion Motor Car Co., Adrian, Mich., has transferred the advertising headquarters of the company to this city, where he will be located hereafter.

Hamilton, Ont.—The Consolidated Rubber Co., of Montreal, is understood to have practically decided to establish a million-dollar plant here for the manufacture of tires for the Ontario trade.

Albion, Mich.—The Apex Horseshoe and Drop Forge Co. has been added to the list of Albion industries. The officers are: President, F. M. Beaman; vice-president, R. Henry; secretary and treasurer, Alvin Dice; directors, Mark Merriman, R. Henry, W. R. Noyes, F. M. Beaman, James Farrant, Samuel Hodge and Alvin Dice.

Omaha, Neb.—Andrew Murphy & Son, dealers in Kelley trucks and Detroit electrics, have started work on a new garage next to their present building at Fifteenth and Jackson streets. The new two-story garage and salesroom of the Drummond Motor Co., dealer in General Motor trucks, is almost completed. A new garage also is being erected across the street from the Drummond building, at Twenty-sixth and Farnam streets, for the Auburn branch.

Baltimore, Md.—Ferdinand C. Latrobe is now handling a general line of motor car accessories in the Oakland Motor Co. building, 6 and 8 East Chase street.

Lima, O.—The Lima Drop Forging Co., of Lima, has filed papers with the secretary of state decreasing its capital stock from $100,000 to $50,000.

Toledo, O.—Charles W. Williams has opened a repair shop in the old Blevins shop in the rear of the Abbott Motor Sales Co. on Madison avenue.

Philadelphia, Pa.—A one-story garage, 137 by 69 feet, is being constructed on the south side of Wood street, east of Broad, for the Packard Motor Car Co. The building when completed will have cost $12,000.

Hamilton, Ont.—F. L. Reed, for 2 years connected with the Schacht Motor Car Co., of Cincinnati, O., has been promoted to the general managership of the Schacht Motor Car Co. of Canada, with general office and factory in this city.

Omaha, Neb.—The Orr Motor Sales Co. has succeeded the Electric Garage Co. in the sale of Packard motor cars, though both of the companies are occupying the same building at Fortieth and Farnam streets. The business is conducted under the management of H. F. Orr.

Manufacturers' Communications

EXPLAINS GRAND PRIX ACCIDENT

COVENTRY, Eng.—Editor Motor Age—Wire wheels are so generally known as steel wheels, and in France as roue metallique, that the fatality which occurred to a spectator at the grand prix race may be in error set to the discredit of the wire wheel. The accident was not due to a detachable wheel completely coming off its inner hub, but to the disintegration of the wheel itself near the hub, thus liberating the hollow spokes, rim and tire. The wheel was not in any sense a wire wheel or a suspension wheel, but was a built-up steel wheel made after the pattern of a wood wheel.—John V. Pugh, Rudge-Whitworth, Limited.

THE A. S. M. E. CODE

Detroit, Mich.—Editor Motor Age—I should like to make several corrections in the remarks in my part of the discussion of Mr. Chase's paper read at the summer meeting of the S. A. E. as they appear in the July 4 issue of Motor Age.

The A. S. M. E. code, which I suggested would be a good one to be guided by in drafting a code for motor car tests, is the A. S. M. E. code for conducting gas engine tests and not steam engine, as stated in Motor Age.

Mechanical efficiency is an important factor but should not be determined by indicator cards. A fairly accurate mechanical efficiency can be arrived at by taking the power to drive at different speeds, as Mr. Chase did in his work. Adding this friction loss to the power developed at the same speeds, we get what will be very close to the indicated horsepower and then proceeding in the usual way we could arrive at a mechanical efficiency.

The compression also is a very valuable thing but should not be taken from the indicator card. It is best taken with a gauge and for every speed that a torque reading has been taken.

In going over Mr. Chase's paper I found that he generally gave the spark advance in degrees on the flywheel, except in one instance, when he gave advance in inches of piston travel. It would be better if only one method were adhered to and for common practice the degrees on the flywheel would be the preferable method; theoretically the inches of piston travel is more accurate. The same, of course, could be applied to valve timing.

It was not in any of my own experiments that I found no relation between back pressure and torque, but in the results tabulated in Mr. Chase's paper.—Ferdinand Jeckle, General Motors Co.

USING CHEAP GASOLINE

London, Eng.—Editor Motor Age—In view of the recommendation of the gasoline companies that motorists could save 4 cents per gallon on their gasoline by purchasing heavier spirit, at least during the summer, I thought it wise to carry out the following experiments with the following spirits on a 15-horsepower Napier with a standard Napier carbureter: Shell gasoline, 39 cents per gallon; Crown gasoline, 33 cents; Pratts gasoline, 39 cents; Taxibus gasoline, 33 cents.

I did this with the following experiments: The hill-climb from a standing start, the speed test with a flying start, both electrically timed.

	M. P. H.			
	Shell	Crown	Pratts	Taxibus
Speed over the ½ mile	50	50	51.14	50
Up Brooklands test hill	12.51	12.77	12.91	12.51
Miles to gallons, at 30 m.p.h.	25.12	25.24	24.86	24.10

From this it will be seen that a Napier car for all practical purposes runs as well on cheap spirit as it does on the more expensive. For starting up when the engine was warm in each case the starting up was equally easy, the pulls used in each case being as follows: Shell, 1; Crown, 1; Pratts, 1; Taxibus, 1.

It therefore will be seen that the recommendation of the gasoline companies to use the heavy cheap spirit at least for the summer should be carried out and 4 cents per gallon saved by the motorist. I will have similar experiments made when the cold, damp weather starts, so as to see if heavy spirit can be used throughout the winter, after which I will advise the motoring army.—S. F. Edge.

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DEPARTMENTS

A Guide to Preparing
Your Will & Testament

Prepared by
Attorney Jeffrey Lynn Ellis

CHOOSE
CHOOSE
CHOOSE

CHOOSE & SAVE

Choose Wisely
Choose Carefully
Choose Your Attorney

Choose Your Attorney
Choose Your Attorney

PHOTOPLAY

Ancient Roman Bridge at Alcantara, Spain

The Roman Empire was the most powerful and influential civilization in the Mediterranean region for nearly 500 years. Its influence was felt throughout Europe, Asia, and Africa. The Romans were famous for their military prowess, their engineering skills, their laws, their roads, their aqueducts, their bridges, their buildings, their art, their literature, their philosophy, their religion, their language, their food, their clothing, their entertainment, their sports, their games, their gladiators, their slaves, their emperors, their senators, their generals, their soldiers, their farmers, their merchants, their craftsmen, their scholars, their poets, their writers, their artists, their architects, their engineers, their doctors, their priests, their gods, their goddesses, their temples, their shrines, their altars, their sacrifices, their festivals, their holidays, their weddings, their funerals, their birth, their death, their life, their love, their hate, their joy, their sorrow, their pain, their pleasure, their wealth, their poverty, their power, their weakness, their strength, their courage, their cowardice, their honor, their dishonor, their glory, their shame, their success, their failure, their victory, their defeat, their peace, their war, their friends, their enemies, their allies, their neighbors, their kings, their queens, their princes, their princesses, their lords, their ladies, their knights, their squires, their peasants, their serfs, their barbarians, their savages, their civilization, their culture, their history, their legacy, their influence, their impact, their contribution, their decline, their fall, their ruins, their remnants, their memory, their forgetfulness, their rediscovery, their revival, their renaissance, their reformation, their revolution, their modernity, their postmodernity, their relevance, their irrelevance, their importance, their unimportance, their significance, their insignificance, their uniqueness, their commonness, their beauty, their ugliness, their truth, their falsehood, their wisdom, their folly, their knowledge, their ignorance, their faith, their doubt, their hope, their despair, their joy, their sorrow, their pain, their pleasure, their life, their death, their birth, their rebirth, their resurrection, their eternity, their infinity, their nothingness, their everything, their anything, their something, their nothing, their everything, their anything, their something, their nothing, their everything, their anything, their something, their nothing

New York Court Sustains Dyer Patent

Judge Veeder Renders Decision in Case of Enterprise Automobile Co. of Hoboken, N. J., Against Albert Solvay in Suit Brought to Determine Validity of Gearset Device

NEW YORK, July 19—The Dyer gearset patents were sustained today in a decision of Judge Van Vechten Veeder, in the United States district court. The Dyer patents are letters patent No. 921,963 and No. 885,986. Forty claims of the latter patent and the whole of the former one were sustained and declared to be valid and infringed in the suit brought by the Enterprise Automobile Co. of Hoboken, N. J., against Albert Solvay, a Brooklyn liveryman and owner of two Darracq cars.

Proof of the patent was made and a defense was filed in behalf of Solvay. The final argument was made June 10 and the matter has been in the hands of the court since that day. The interlocutory decree awarded a permanent injunction, accounting and damages. The claims which were sustained are very broad and cover in general the combination with a driving shaft made in two parts of a gearcase and a two-part clutch connecting the two shaft parts; one of the clutch parts sliding upon its supporting shaft part, a gear connected to the sliding clutch part and sliding with it, a gear on the other shaft part rotating with it, an auxiliary shaft mounted in rigid bearings carried by the gearcase and gears movable in a fixed plane on the auxiliary shaft. There also is specified means for longitudinally sliding a moving clutch part and its companion gear to disengage the two shaft parts and engage the gear with the gear on the auxiliary shaft to cause the two shaft parts to rotate in a different speed relation—that is to give the speed reduction in the gearset. A jaw clutch for direct drive and a reverse gearing also are included in the claims.

The seventeen claims of patent 885,986 which were not covered, or which were not mentioned in the decree are as follows: Claim 18 covers a phase of reduced speed gearing that is disconnected when not in use. Claim 19 is the same except that it includes a reversing gear. Claims 32 to 45 deal with details of operation; 47 is for a means for directly connecting the driving and driven shafts with all intermediate gears at rest. The seventeen claims were not in issue so far as appears on the record.

While the court went to considerable length in considering the case, the defense that is promised when the same patents are tried out in the basic suits against the Maxwell, Winton, Locomobile and Saurer companies will be much more elaborate and detailed.

Motor car manufacturers have been awaiting this decision with interest as the Dyer patents under litigation have a bearing upon the gearsets employed by several of them. The fact that the test case was decided in favor of the Enterprise Automobile Co. and the Dyer patent claims sustained may open the way to other suits.

UNIVERSAL CANCELS OPTION

Detroit, Mich., July 20—The option on the Universal Motor Truck Co.'s plant, which was held by W. E. Flanders and the Studebaker interests, was cancelled by the directors of the Universal company at a meeting held Thursday. This leaves the truck concern entirely in the hands of the Schlitz brewery interests of Milwaukee, represented by Messrs. Uehline and Kopmeier, and F. K. Parke, of Detroit.

The capital stock of the company will be increased to a million dollars, the interested parties having already added $500,000 to the capitalization to make possible the enlargement of the plant and the production of an entirely new truck proposition in addition to the present product. The new machine is a worm-drive affair, having a capacity of 1 ton, and has been in the course of its development for some time.

It is the intention of the directors to make the concern the largest truck manufacturing plant in the city, if not the largest factory in the world devoted exclusively to the manufacture of commercial cars. With this end in view, unlimited capital will be placed at the disposal of the organization, according to Mr. Kopmeier.

DECIDES AGAINST BERGDOLL

Philadelphia, Pa., July 20—Judge Audenried filed an opinion in common pleas court No. 4 Thursday awarding judgment for $104,000 to the Westinghouse Machine Co. against the Louis J. Bergdoll Motor Co. to recover a balance due for the furnishing of 1,000 gasoline motors. The companies entered into a contract on March 15, 1910, whereby the manufacturers were to supply the engines for a total of $210,000. A dispute arose over the manner in which installments on account of the purchase price were paid and in which the motors were supplied. The Westinghouse company brought suit and secured the judgment on a rule for want of a sufficient affidavit of defense.

C. W. NASH SUCCEEDS MEAD

Detroit, Mich., July 22—While in no way relinquishing his position as vice-president and general manager of the Buick Motor Co., of Flint, Mich., which he has held for the past 2 years, C. W. Nash has assumed the position of vice-president of the General Motors Co., of which the Buick company is a subsidiary. His added responsibility to the parent concern will in no way interfere with his supervision of the affairs of the Buick plant, for the success of the product of which he is largely responsible.

An announcement of a change in the personnel of the Olds Motor Works organization at Lansing is to the effect that George L. East has resigned as director of advertising to become affiliated in a similar capacity with the Amplex Motor Car Co., of Mishawaka, under W. J. Mead, who recently became the president and general manager of the Indiana concern. He will be located at the Chicago offices of the Amplex company, where it is planned to conduct the sales and advertising departments.

FORD WINS BUFFALO SUIT

Buffalo, N. Y., July 22—Judge Hazel late this afternoon granted a temporary injunction to the Ford Motor Car Co., restraining the International Automobile League of Buffalo, composed of John H. Tranter, Alfred C. Bidwell, William Priess, and John C. Hurley, from selling Ford cars at less than the standard price, infringing on Ford patents and from confederating with the dealers to procure machines at less than cost. The officials of the International Automobile League of Buffalo are ordered by Judge Hazel to appear in court on Tuesday, July 30, to show cause why the injunction should not be made permanent and also to appear before him the first Monday in September to reply to the bill of complaint.

CHANGE IN OTTO PLANS

Philadelphia, Pa., July 22—The Otto car will be handled in future, as far as sales are concerned, by the Otto Gas Engine Works, the original manufacturer of the car, according to announcement. For the past year the line has been handled and sold by the Otto Mobile Co. of Mt. Holly, N. J., which went into the hands of receivers last week. The manufacturing company announces that it has no corporate connection with the embarrassed concern. The plan of handling the line has not been presented in detail, but it is probable that the manufacturers will contract directly with dealers throughout the United States and abroad.

MACK IN NEW LINE

New York, July 22—John M. Mack, one of the founders of Mack Brothers, makers of the Mack line of motor trucks, now included in the product of the International Motor Co., which has also the Hewitt and Saurer lines, has resigned his position as vice-president and has entered another phase of the manufacturing field. It has been announced that he has formed a $600,000 corporation to manufacture motor fire engines and motor cars at Allentown, Pa., and has secured control of the Webb Automobile Fire Engine Co. of St. Louis.

It is stated that the manufacturing op-

erations will be transferred from St. Louis to Allentown and that the new company has secured the plant of the Allentown Machine and Foundry Co., to which will be added a brassmaking plant now located in Philadelphia and controlled by Mr. Mack. Just what changes will be made in the construction of the Webb line have not been announced.

WHITE ABANDONS YEARLY MODEL

Cleveland, O., July 22.—The White Co. has given up entirely the idea of announcing and bringing out new models at a certain specified time each year. Hereafter the various cars will be known by their model leters, without reference to date, and a model will continue, irrespective of the year, until it is found advisable to change it. At that time the current model designation will be dropped, and a new one used to differentiate between the old and the new cars. Any change in models that is found advisable will be made as soon as it is apparent that such a change will be a real improvement to the car. There will be no 1913 announcement made by the White Co.

OVERLAND'S 1912 PRODUCTION

Toledo, O., July 22—With an actual total production of 20,845 cars for the 1912 season, the Willys-Overland Co. finishes, August 1, its most successful year since the organization of the company.

The fiscal year of the Overland ends July 31 and the monthly production of cars for the past year is as follows: August 1911, 284 cars; September, 869; October, 1,472; November, 1,851; December, 1,588; January, 1,826; February, 2,201; March, 2,960; April, 3,011; May, 2,605; June, 1,591; and July 539.

"These figures represent the actual number of cars shipped from the Overland plants and do not represent the total number of orders received from our dealers," says Vice President G. W. Bennett. "In no way have these figures been exaggerated. Our output for 1913 will approximate 40,000 cars."

FAST WORK BY MERCEDES

Chicago, July 24—A cablegram received today by L. B. Kilbourne, partner of Charles Y. Knight in the Knight engine business, conveys the information that a by 5-inch four-cylinder Mercedes-Knight as just run a 30-mile test on European ads at the rate of 78 miles an hour. It is ot known just where the test took place.

RECEIVER FOR DETAMBLES COMPANY

Anderson, Ind., July 20—John C. Teeanden, an attorney of Anderson, has been ppointed receiver for the De Tambles Mo- r Co., of Anderson. The action was taken n a petition brought in the federal court Indianapolis, alleging that the company insolvent and has been paying certain creditors, thereby making their claims preferred. The creditors filing the involuntary bankruptcy petition were the Class Journal Co., Michelin Tire Co. and St. Louis Screw Co., whose claims aggregate $5,476.32. Two suits were brought in the Madison county courts recently asking that a receiver be appointed for the company.

MEYERS ON U. S. M. COMMITTEE

New York, July 23—Sidney S. Meyers, attorney for the Motor and Accessory Manufacturers has been elected a member of the creditors committee now active in handling the affairs of the United States Motor Co. finances. The move was made in order to maintain close touch between the banking creditors who originally took action to grant the present 90-day extension of credit and the merchandise creditors reports of June sales by the United States Motor Co. are to the effect that the business was in the neighborhood of $2,000,000 and so far in July the promise is for about as much more.

MAIS RECEIVER NAMED

Indianapolis, Ind., July 22—On a suit brought in the superior court by Edwin King, Judge Collier has appointed Franklin Vonnegut receiver for the Mais Motor Truck Co. It is probable that steps to sell the company's property will be taken within the next 30 days.

King is a contracting builder who built a factory building for the company at a cost of $5,050 on which he has received $2,800. The suit was brought to protect a mechanics' lien against the property. King alleges the company is in danger of insolvency and has no money with which to conduct its business. He does not charge, however, that the company is insolvent. The complaint alleges that on July 1 the company's assets were $250,000, the liabilities $180,000, the latter not including $66,000 of outstanding notes.

Will H. Brown, president of the company, said he had no comment to offer at this time regarding the suit, except that it was thought the company's affairs would be straightened out through the proceedings. Harold S. Block, a stockholder, brought receivership proceedings against the company last November, but this suit was not pressed when satisfactory arrangements were made. This suit was dismissed prior to the filing of King's complaint.

Fisk Rubber Co. Wins Big Patent Suit

Massachusetts Court Holds Chicopee Concern Does Not Infringe Thropp Device Which is Based on Tire-Forming Idea, Case Being Dismissed by Reason of Anticipation

BOSTON, MASS., July 23—Special telegram—Judge Brown of the United States district court of Massachusetts, has handed down his opinion in the suit in equity filed by the De Laski & Thropp Circular Woven Tire Co. against the Fisk Rubber Co. of Chicopee, Mass., in which he dismisses the bill.

The suit alleged infringment of the Thropp patent granted in 1905 and it was important to all tire companies, for had it been sustained it would mean the paying of large royalties to the De Laski & Thropp company by all tire manufacturers. It is one of the most important tire decisions ever made and the outcome has been awaited anxiously by the tire manufacturers.

The Fisk company produced evidence from Akron, Detroit, Hartford, Cleveland and other places where tires are made to prove that the claimant was not entitled to any basic claims on his patent and Judge Brown upheld the contention of the Fisk Rubber Co.

Infringement of claims 1 and 2 of letters patents No. 822,561, to P. D. Thropp for apparatus for manufacturing tires is alleged in the bill. Application for patent was filed in 1905 and the patent is dated June 5, 1906. The invention relates especially to apparatus for holding a clincher tire in position during the process of vulcanizing. Claim No. 1 covers a tire-forming apparatus comprising an annular core or mandrel with annular pressure rings to engage the clincher edges of the tire, leaving the outer body portion exposed. There also are specified means for forcing the pressure rings into position. In connection with this, claim No. 2 specifies an inwardly extending rib attached to the mandrel.

The invention, according to the complainant, lies in the apparatus for moulding and giving pressure to tire casings during vulcanization by what is known as the one-cure wrapped-tread method, in which the inner casing, including the thread, is built upon a core at one time of unvulcanized stock. The side pressure rings then are applied and inclose the clincher part of the tire, leaving the outer body portion uninclosed. The whole is spirally wrapped with a porous case and submitted to a vulcanizing heat.

The bill was dismissed on the grounds that claims No. 1 and No. 2 of the patent are invalid by reason of anticipation, as it was shown that most of the tire makers had constructed similar apparatus prior to the date of the patent in suit.

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Transcontinental Highways

MORE than ever before is the attention of the people and the governments directed to highways that will lead from the Atlantic to the Pacific. A few years ago the cross-country motorists exploited the theory in glowing terms through the columns of the press in every city and hamlet passed through; but it generally stopped here. Within the last year a new phase of transcontinentalism has appeared, the program has advanced a long step, the matter has been brought to the attention of the statesman and the question at once brought into the political arena. Congressmen have been asked to pledge themselves to the movement; state governors have been approached to have such a plank incorporated in the state platform; and even presidential nominees have been asked which way they are facing in the matter.

For a time transcontinentalism was side-tracked because of the federal aid movement in the building of roads, which has been exploited at every good roads convention for the past 2 years. With the feeling that many states that have spent enormous sums of state money in road building would be opposed to the federal aid scheme there has arisen a feeling that federal aid could be obtained for a series of transcontinental roads if not for a universal road system throughout the country. The feeling is that the Washington government could furnish half of the funds, the state the other half. In some sections the financial analysis goes further and divides the half assumed by the state so that the state pays but one-quarter and the county the other quarter. This final analysis is a good one in that it gives the people along the right of way a more direct interest in the road.

Wherever a transcontinental highway goes the property owners fronting on it should have a direct interest in the highway, they should have to aid in building it through their county organizations, as well as indirectly through the state and also through the federal authorities. Home interest is a big asset in road construction, it is the one certain way of maintaining interest, and prevent paupery in the road building zone.

It is questionable if for many years hence the eventful transcontinental highway will be settled upon. At present the road building enthusiasm is rampant enough to want nearly a score of cross-country roads; every new good roads organization wants its town or city to be on a highway that leads direct from the Atlantic to the Pacific. This spirit coupled with shifting the movement into the political arena will develop the danger of making the routes of national cross-country highways fields for political intrigue. Already in some highways across states the political influence has been such that the natural course has been left and wholly unnatural roundabouts incorporated into the highway. So glaring have some of these political schemes been that the traveling public have refused to follow the lines outlined and have taken the normal and rational route. Already such a spirit is growing at a dangerous pace. Municipalities have offered large sums of money if their city or town, or historic center, can be incorporated in a trans-nation highway. Such will never be possible. The persons entrusted with laying out a highway must look upon the project through the eyes of the sculptor, who fashions the marble of this age so that it meets with approval in the eyes of generations yet to come. Trans-national highways will be monuments, monuments that must endure, monuments that must meet the needs of millions yet unborn. Trans-national highways are not merely roadways for this generation or for the next but for billions yet unborn, consequently the persistence of some glib-tongued politician setting his cap for immediate endorsement must not be a determining factor in where and wherenot the national highway crossing the Alleghanies and the Rockies shall go.

Skidding Dangers

THE more general use of oiled roads this season has greatly increased the number of serious skidding accidents and particularly was this so during the recent heavy rains that were so general throughout the eastern part of the country. From every state has come the story of the car skidding on the curve, striking the telegraph pole, crashing into the tree or turning completely around on the slippery pavement and ending up in a deep ditch. In many of these accidents old drivers were at the wheel, in others it was the amateur, and in practically every case special precautions against skidding such as the use of anti-skid devices or anti-skid tires were not attended to. It but once more demonstrates the disposition of so many to tempt fate, to imagine their tires have special adhesive propensities and to laud their driving ability.

There is little necessity for skidding if only the rational attention is given. With the present highly-crowned roads, slippery with oil and then deluged with water it is highly difficult to proceed in safety without adequate anti-skid provisions and it calls for the utmost care under such circumstances, in fact, the driver is scarcely ever sure of being safe. Some of the serious skids have taken place at speeds of little more than 15 miles per hour. There is only one preventive and that is the stitch-in-time method. Do not wait until the skid before attaching your anti-skid devices; take time by the forelock and be on the safe side.

Losing Accessibility

SEVERAL of the 1913 models at present announced or ready for announcement appear after a cursory examination to be more complex and less accessible than the models of this season and many of last season. This is due to new arrangements, new devices and new systems. With some the complexity of a new self-starting system has resulted in making the magneto much less accessible and in generally confusing the otherwise clean-cut appearance of the motor. The more or less unsettled position of the lighting generator has had a confusing effect on the motor. With some it has been an after-thought.

It must be said that although such improvements as self-starters and electric generators must be considered, that while other older accepted motor equipments have been rendered less accessible by the installation of the new, yet these older parts can afford to be so housed in because they have traveled far through the gamut of evolution and many of them are in a sufficiently developed and perfected state as rarely to call for any attention, so that the recent inaccessibility becomes less of an inconvenience than it appears on first glance. Motor Age has since its inception stood for accessibility and still stands stronger than ever for it and believes that the present positions and arrangements of some of the motor appurtenances are impossible as permanent locations, and further that they will be entirely altered before the lapse of another year.

Minerva-Knight and Hermes Teams Tie

Belgian Grand Prix, a 2-Day Event, Brings About Warm Competition

PARIS, July 21—Special cablegram—The three-car teams of the Minerva-Knight type and Hermes cars tied for first place in the 2-day Belgian grand prize race run over the Ardennes circuit and which closed today. The 2-day event comprised twelve rounds over the 30-mile course for each day's race, making the total distance 720 miles.

Ten teams of three cars each and individual cars started yesterday. Among these were the Lion-Peugeot, of French grand prize fame, a Mercedes [illegible] team, three Opels, three Benz and [illegible] Excelsiors, and three-car teams of S[illegible] V. A., F. A. B. and Vivinus makes. [illegible] grand prizes of France Schneiders w[illegible] also entered but did not constitute [illegible] complete team. Besides there was a Ger[illegible] valveless, a Chartier, Rolland-Pilan, Hispano Suiza and Ford.

While there was not one fatal accident, one car was wrecked in the course of the race, this being a standard Ford car. The Mercedes team of cars having Knight engines with 4.5 liters on 275 cubic inches piston displacement were penalized 1 point, due to a slipping clutch, and the Opel team 6 points, owing to varied troubles. One of the Peugeot cars was braked by its driver when the spectators rushed on the track, causing the universal joint to be damaged and entailing 1 point to its team which was eliminated when Zuccarelli, one of the drivers, experienced timing gear trouble. Besides this team, the S. S. A. V. A. and F. A. B. cars, as well as the Gormain machine, were withdrawn.

The cars entered were classed by piston displacement under three classes, 20 liters, 30 liters and 4.5 liters. Each class of car was assigned a mean speed at which to make every round of the course. For instance, the 30-liter cars were ordered to maintain an average speed of 64 kilometers, or 24 miles an hour. The rating of the cars' work was done on the following basis: The first round every day done within the assigned time was counted 1 point each; the following lap was valued .1 higher than the preceding one, making the second lap count 1.1 points, the eleventh 2 and the twelfth 2.2 points. The times assigned to the cars took in the time necessary to make a reasonable number of tire changes so that time loss above the maximum time allowed to the cars was proportionate to actual trouble on the course.

PORTER WATSON CUP WINNER

Syracuse, N. Y., July 24—Twenty-five cars competed in the third annual run held by the Automobile Club of Syracuse for the B. E. Watson trophy cup, held Saturday to Trenton Falls and return, a distance of 143 miles. This was the longest run yet held for the cup. The run out was made via Rome and the return via Utica. The weather conditions were ideal. A short stay was made for dinner at the Trenton Falls hotel and the cars checked in on the return at about 7 o'clock, the start having been made at 9 a. m. Trenton Falls is in the Adirondack foothills, 20 miles north of Utica. R. E. Porter, driving an Overland, won the event, which was, as usual, a sociability run, the winner being he that should come nearest a secret time allowance based upon the speed regulations of the general state law and the various towns and villages traversed. Mr. Porter made the trip in 7:54:12, coming within 2 minutes of the secret time, which was 7:51:18. J. L. Youman's Mitchell car was second with 7:47:32, and C. Badgeley was third with 7:56:17. He drove a Franklin. Miss Pearl E. Cheshire, 18 years old, won the woman's cup with a Ford, her time being 7:28:54. The trophy was offered by the club. Mrs. L. C. Whitbeck was the only other woman driver.

Coming Motor Events

July 22-27—Cadillaqua celebration at Detroit, Mich.
July 27—Track meet; Rochester, N. Y.
August 5-7—Pacific Highway convention; San Francisco, Cal.
August 8—Minneapolis-Winnipeg tour.
August 8-9—Banta trophy team match, Chicago Motor Club.
*August 8-10—Galveston beach meet; Galveston, Tex.
August 10—Hill climb; Whittier, Cal.
*August 30-31—Elgin road races; Chicago Automobile Club; Elgin, Ill.
*September—Commercial vehicle run; Chicago Motor Club.
September 2—Track meet at Winnipig, Canada.
September 3-6—Chicago Motor Club's truck demonstration.
September 17 — Grand Prix; Milwaukee, Wis.
*September 20—Wisconsin challenge and Pabst Trophy races; Milwaukee, Wis.
*September 21—Vanderbilt road race; Milwaukee, Wis.
September 17-20—Fire engineers' convention; International Association Fire Engineers, Denver, Colo.
September—Track meet; Universal Exposition Co., St. Louis, Mo.
*October 7-11—Chicago Motor Club reliability run, Chicago.
October 12—Track meet; Rockingham park, Salem, N. H.
November 6—Track meet; Shreveport Automobile Club, Shreveport, La.

*Sanctioned by A. A. A.

SHOWS

September 23-Oct. 3—Rubber show, Grand Central palace, New York.
September 28-Oct. 6—Exposition agricultural motor cars, Bourges, France.
November 8-16—Olympic show; overflow November 22-30 Agricultural Hall.
December 7-22—Paris salon.
January 4-11, 1913—Cleveland show.
January 11-18—New York pleasure car show; Automobile Board of Trade; Madison Square Garden and Grand Central Palace.
January 11-22—Brussels, Belgium show, Centenary Palace.
January 20-25—New York truck show; Automobile Board of Trade; Grand Central Palace and Madison Square Garden.
January 20-25—Philadelphia show.
Jan. 27-Feb. 1—Detroit show.
February 1-8—Chicago show.
February 10-15—Minneapolis show.
February 17-22—Kansas City show.
Feb. 24-March 1—St. Louis show.
March 3-9—Pittsburgh show.
March 8-15—Boston show.
March 17-22—Buffalo show.
March 19-23—Boston truck show.
March 24-29—Indianapolis show.

DETROIT HAS IMMENSE PARADE

Detroit, Mich., July 24—Detroit, the motor car city, came into its own yesterday afternoon when more than 5,000 beautifully and cleverly decorated motor cars paraded through the streets before a record-breaking crowd. The long column, which was three abreast in many places, took an hour and three-quarters to pass the reviewing stand, and was without question the largest assemblage of machines ever witnessed by the people of any time. The parade was formed at the corner of Woodward avenue and Grand boulevard and passed down Woodward to Jefferson, then eastward on that thoroughfare to East boulevard, where it was disbanded, a distance in all about 6 miles.

A number of the Detroit manufacturers were represented in the unique procession, the Studebaker Corporation exceeding all others in the number of cars in line.

ANOTHER SOCIABILITY PLANNED

Washington, D. C., July 22—So successful was the sociability run of the Automobile Club of Washington, held several weeks ago, that the club is planning to promote another contest along the same lines. A different route will be laid out and efforts will be made to secure the entry of more than 100 cars. It is likely President Taft will be asked to set the secret time in which the run will be made.

TESTING MICHIGAN LAW

Washington, D. C., July 24—Car owners are interested in a suit filed today in the United States Supreme Court to test the constitutionality of the Michigan law of 1909, making an owner liable for damages done by a machine without regard to who was driving it when the damages were inflicted. The Metzger Motor Car Co., held liable to pay a farmer $1,800 for damages by one of its cars driven without its consent, claims a state is without power to pass such a law.

IMPERIAL GETS NEW PLANT

Detroit, Mich., July 22—The Imperial Automobile Co., of Jackson, Mich., has acquired ownership of the factory buildings where the Buick company has been manufacturing motor trucks.

Bruce-Brown Enters Elgin Road Races

Grand Prix Winner, Just Back from France, Elects to Drive in Free-For-All at Chicago Automobile Club Meet—Falcar in Aurora Cup Event—Four Mercers Are In

CHICAGO, July 23—The Chicago Automobile Club is receiving considerable encouragement in the promotion of the Elgin road races, which have been set for August 30-31. While the entry list is not so very lengthy at the present time, the blanks having been issued only last week; still, there are many prospects in sight and it would seem as if the club would have little difficulty in filling all four of the races which have been scheduled.

The success of the free-for-all, the feature of the second day, was assured yesterday when Fred J. Wagner, representing the club in the east, wired the entry of David Bruce-Brown, just back from France. Bruce-Brown will drive in the free-for-all, but so far he has not decided what car he will pilot. Inasmuch as Milwaukee claims him with a Fiat, it is presumed that the American grand prix winner will handle one of that make. Inasmuch as both Ralph Mulford and Erwin Bergdoll, Vanderbilt and Fairmount Park winners, respectively, both promised to drive at Elgin when they passed through here on their way home from Tacoma, the Chicago Automobile Club is certain of having at least three of the stars.

A telegram also was received today from Wagner notifying the club that the Mercer company has made four entries and that he will get de Palma when the latter returns from Europe. De Palma is bringing a new Mercedes with him.

The first entry actually received was one from Edward Marhoefer, president of the Fal Automobile Co., who nominated a Falcar for the Aurora cup race for 231-300 class cars. He also promised to make a second entry in the Elgin National. This marks the return of the Falcar to racing after an absence of a year. The success of this car in 1910, when it captured the Wheatley Hills trophy among many others, will be recalled.

Encouragement received by F. E. Edwards, chairman of the entry committee, leads the club to believe that inside of a week or so it will receive entries from Stutz, Mercer, Knox, Rayfield, King, Cino and several others. W. B. Huey, a member of the club, hopes to put in a Marmon, with Joe Dawson for driver.

TALK DESERT RACE PLANS

Los Angeles, Cal., July 20—At an enthusiastic meeting of Los Angeles dealers last week, George Purdy Bullard, representing Governor Hunt of the new state of Arizona, took up the matter of the next Los Angeles to Phoenix road race. It developed during the meeting that practically $10,000 would be raced for this year, including the purses for the big track events during the fair week at Phoenix.

Another meeting will be held in the course of the next 10 days, at which time the rules for the contest will be drawn up and the route definitely selected. The majority of the dealers favor the San Diego route. The track events will consist of the following:

Free-for-all, 50 miles—Purse $2,000, cut 65, 25 and 10 per cent. Must be three cars entered not in Phoenix race. Entrance fee $100 returned if car goes 5 miles; otherwise forfeited to fair association.

Track record for 1 mile—Purse $100, with additional $35 for every second cut off of :55 by winner.

Free-for-all handicap for cars in Phoenix race only, 10 miles—Purse $300, cut 65, 25 and 10 per cent.

Ten-mile handicap free-for-all—Purse $400; money cut 65, 25 and 10 per cent.

Ten-mile race for large cars in Phoenix race—Purse $400; cut 65, 25 and 10 per cent.

Ten-mile race for small cars in Phoenix race—Purse $200; money cut 65, 25 and 10 per cent. Three or more cars must start in each race.

RESULTS OF ALPINE TOUR

London, July 1—Twenty-five perfect scores were awarded at the completion of the Alpine contest, held last month in Austria. The prizes were all of practically equal value, and drawing of lots had to be resorted to to determine their distribution. Germany led with the number of perfect scores, a Mercedes, an N. A. G., three Opels, an R. A. F., three Benz cars, two Audi cars, a Hansa and a Mathis, totaling thirteen. Austria follows with eight cars, a Gräf & Stift, a W. A. F., a Lauren & Klement, a Praga, and four Austrian-Daimlers. Three Fiats, Italian, finished perfect, and one Knight-Minerva from Belgium. The tour was one of the most difficult ever run in Europe, and the fact that seventy-one out of eighty-four entrants finished, twenty-five with perfect scores, speaks exceedingly well of the quality of European motor cars.

PROGRESS OF ALCO TRUCK

Denver, Colo., July 20—Out of all possible communication with the world and without food for 27 hours were experiences of the Alco crew when a break in the huge irrigation canal near Sterling, Colo., engulfed the transcontinental truck in a sea of alkali mud.

On account of the severe conditions on terrific roads and trackless prairies the vehicle was able to cover only 121 miles, a climax to the hardship of piloting the motor freighter from Philadelphia to Petaluma, Cal. The vehicle was located in Fort Morgan, after being marooned in the heart of the flood and famine-stricken district. At this point it had piled up a distance of 2,305 miles.

A telegram from E. L. Ferguson, captain of the expedition, states that the disastrous cloudburst about Denver washed away bridges and roads ahead. This enforced a detour that added many a mile to the route of the truck.

BOSTON MAY HAVE RACE MEET

Boston, Mass., July 22—Secretary James Fortesque, of the Massachusetts State A. A. has been interviewing some of the well-known motorists of Boston relative to a race meet at the Readville track on Labor day. The plan outlined is to have twenty men each subscribe $100 as a guarantee against loss, and in case the meet proves successful these men will get their money back and the profits be divided among the Bay State A. A. of Boston, the Newton Automobile Club and the Massachusetts State A. A. As the date would follow 2 days after the Elgin races and it would not be possible to get many of the stars to Boston, some of the men approached are in doubt as to the success of the plan, believing that Columbus day would be a better date, as it comes in October, providing that Rockingham Park does not put on a meet that day. There also is talk of races at Old Orchard on Labor day so that would conflict with securing entries.

FARMERS' RELIABILITY STARTS

Dallas, Tex., July 22—With seventeen entries, composed entirely of farmers and ranchmen of Texas, the Farm and Ranch tour started this morning at 10 o'clock. The tour is the biggest of its kind ever organized, being composed of a runabout class and a touring car division, each class being divided into seven divisions. The route is practically 700 miles in length, extending from Dallas, through Waxahachie, Hillsboro, Waco, McGregor, Temple, Georgetown, Austin, San Marcos and New Braunfels to San Antonio; returning by practically the same route to Dallas, arriving Saturday night.

Entries are restricted to farmers and ranchmen who own cars. Four passengers must be carried in each touring car and two in a runabout, the owner driving. The farmers of Texas have evidenced a keen interest in the event and increased sales are anticipated by dealers in Texas as a result. The entries are:

Buick—W. G. Maze, T. O. Williams, H. L. Perkins, N. B. Flagans, G. J. Merritt, C. P. McKenzie, Albert Marrs and H. V. Kendric.
Ford—C. C. Gipe, W. R. Newton, William F. Ramming, G. E. McDaniel and R. G. Roach.
Case—W. H. Anderson, T. L. Swink and W. C. Armstrong.
Mitchell—J. N. Colwick and R. B. Dunn.
Overland—O. L. Simms, Verge Coleman and W. R. Garland.
Hupmobile—E. B. St. Clair, Paul G. Lundell, S. J. Hall, W. A. Hamilton and D. B. Currie.
E-M-F—J. M. Howe and P. W. Bean.
Reo—W. G. Camp.

Cadillac—W. C. Kingsley.
Regal—E. C. Clark.
Maxwell—D. W. Rutherford, L. B. Blain and Taylor McGinnis.
Franklin—A. J. Poulter.
Chalmers—W. B. Mickle.
Oakland—B. F. Wilkinson and B. H. Mathews.
Hudson—J. Mantel.
Knox—Henry Horsford.
Brush—W. C. Christian.

In addition to the regular entries, many non-contesting cars are accompanying the tourists throughout the run.

The prizes to be awarded are a silver loving cup, to be presented as first prize by Colonel Holland, and several cash prizes. This trophy is said to be the finest cup of its kind ever exhibited in Texas. The prizes will be awarded immediately upon the arrival of the tourists.

A large number of inquiries have been received concerning the tour, from all parts of the country.

PUBLIC CARS CALLED NUISANCES

Philadelphia, Pa., July 22—That motor cars bearing "to hire" signs standing on certain of the principal business thoroughfares in the central section of the city are an obstruction to traffic and a nuisance, was a decision rendered recently by Magistrate MacFarland in the central court, who held two chauffeurs under $200 bail for court for permitting their cars to stand in front of the Bingham hotel after being warned not to do so. On the part of the accused it was contended that discrimination was practiced by the police in ordering some cars away while not molesting others, but in the case of the latter it was claimed they held permits. As no permits are issued, Magistrate MacFarland said that all chauffeurs similarly charged with obstructing the highway were to be arrested.

TRADESMEN BANQUETTED

Indianapolis, Ind., July 22—Business interests of the city paid a parting tribute to R. H. Losey, retiring manager of the local sales branch of the Buick Motor Co., last Wednesday night. Mr. Losey is to become general sales manager of the Republic Motor Co., with headquarters in New York.

Mr. Losey was asked to enter a motor car and go downtown to attend a meeting of directors of the Indianapolis Automobile Trade Association. Instead he was taken to a farmhouse east of the city, where about seventy-five business men of Indianapolis had gathered to act as his hosts at a chicken dinner. Mayor Samuel Lewis Shank was toastmaster.

Fred G. Rinker, retiring superintendent of the Indianapolis plant of the Willys-Overland Co., was the guest of honor at a dinner given by thirty-five foremen of the plant, at the Denison hotel, Indianapolis, on the night of July 17. Mr. Rinker is now with the Federal Motor Co. as superintendent of its plant in Indianapolis.

Milwaukeeans Finance Big Road Races

Business Men Respond and Prospects for Speed Carnival Are Regarded Bright—Advance Sale of Seats Already Totals $15,000—Tentative Entry of Three Peugeots

MILWAUKEE, Wis., July 23—The international road racing carnival to be held at Milwaukee on September 17, 20 and 21 has been entirely financed by the business interests of the city, a mail order seat and parking space sale of better than $15,000 has already been recorded, and nothing can be discerned on the horizon which will interfere with making the races the most successful and popular motoring events the world has ever seen.

There will be seventy-five to eighty cars on the Milwaukee course in the four events, the contests for the grand prix, Vanderbilt cup, Pabst Blue Ribbon and Wisconsin Challenge trophies. That much is assured by the promises already made to Race Secretary Bart J. Ruddle, of Milwaukee, and his associates in the east and west, among which Fred J. Wagner, starter of the A. A. A., is one of the most prominent.

The tentative entry of three Peugeot cars, including the Boillot Peugeot which won the French grand prix on the Dieppe course, has been delivered to Manager Ruddle. E. E. Hewlett, of Los Angeles, has mailed the entries of three Fiats, which will be piloted by Tetzlaff, Caleb Bragg and Bruce-Brown. It is likely that the Fiat which Bruce-Brown drove in the French classic will be brought to America, making a team of four Fiats. The three sure-thing Fiats for Milwaukee are the private car of Bragg, the car which Bruce-Brown drove to victory in the two grand prix races at Savannah and the one which Tetzlaff used to pull down the money in the Santa Monica this year.

Entry blanks which have been filled or are about to be filled are scattered all over America and Europe, and Manager Ruddle states that he is not in a position at this time to make public the definite list.

For 2 weeks the department of the Milwaukee Automobile Dealers' Association in charge of the sale of seats and parking spaces has carried on a nation-wide campaign, which already has resulted in the receipt of orders aggregating more than $15,000. This is particularly gratifying because the races are still 2 months off. The association has figured that there will be 43,000 grand stand seats, 200 boxes and 1,200 box seats, with parking space for 20,000 cars. Prices for seats and spaces have been made very liberal, as the following scale will show:

Parking spaces, $10, $20 and $25 per car daily, according to advantage of location with relation to start and finish line.

Grand stand seats, $2 and $2.50 daily. Boxes containing six seats will cost $30 daily. The general admission fee will be $1.

The mail orders are being cared for in a most up-to-date manner. Manager Ruddle has devoted considerable of his attention to the cataloging system by means of which every seat and parking space reservation can be picked out in less than a minute's time.

August A. Jonas, chairman of the racing committee of the M. A. D. A., is on a month's tour in a Cadillac through the east and up into Canada and its wilds. His itinerary includes Grand Rapids, Detroit, Cleveland, Toledo, Buffalo, Niagara Falls, Toronto, Montreal, Boston, New York, Philadelphia and Pittsburgh. He will return on August 20.

Mr. Jonas wired Manager Ruddle on Monday that the Wolverine Automobile Club of Detroit has arranged for a club tour to Milwaukee similar to the one made to Indianapolis for the 500-mile race. There will be at least 600 in the party and reservations have been made for two full sections in the main grandstand. In Toronto, Mr. Jonas was given reservations for sixty box seats. Interest in the east is running high.

Contracts were signed on Monday for the services of 1,000 members of the Wisconsin National Guard to police the course. Sheriff William Arnold, of Milwaukee county, has arranged to appoint 200 deputy sheriffs, and Chief of Police John T. Janssen expects to have 100 patrolmen and a dozen or more plain clothes men on duty during the three days of racing.

Approximately 100,000 dodgers advertising the races were distributed by the cars participating in the third annual Wisconsin reliability tour last week. Interest in the road races in even the hamlets was surprising to the Milwaukee men, and particularly surprising was the familiarity of the rural residents with the details of the races, the names of drivers, possible speed and other knowledge that only the experts could be expected to converse intelligently upon.

DEATH OF COLONEL JOYCE

Minneapolis, Minn., July 22—Colonel Frank M. Joyce, first vice-president of the American Automobile Association, and former president of the Automobile Club of Minneapolis, died this morning from Bright's disease after an illness of a month. Colonel Joyce was a son of the late Bishop Isaac W. Joyce of the Methodist church. He leaves a widow and four daughters.

Plans Made for Mammoth Tire

United States Rubber Co. Proposes to Augment Its Present Manufacturing Facilities by Erecting Factory—Capacity, 2,000,000 Casings a Year—Chicago Mentioned

NEW YORK, July 22—Announcement by the United States Rubber Co. that a mammoth tire factory is to be built to augment the present manufacturing plants discloses at least a portion of the motive for the recent financial expansion of the company.

President Samuel P. Colt recommended to the annual meeting of the stockholders that $10,000,000 of liquid cash capital be added to the company's finances, but the concrete reason for the addition was not made clear to the public at the time. Now it appears that the company contemplates the erection of a new factory which will have a capacity of 2,000,000 casings a year.

While the rumored statement that the new plant would be located at Chicago and that building operations would be started in October could not be confirmed at the offices of the company, it was announced that such action was probable.

A plant of such magnitude as that outlined for the United States Rubber Co. would have a capacity about equal to the 1910 production of all the factories at Akron, O., and nearly 60 per cent of the estimated production for the current year.

For about 2 years the tire industry has been under constant and insistent pressure in all the manufacturing departments, and overtime has been the general rule throughout the industry. Some of the factories have been constantly sold ahead for from 3 months to a whole year.

In response to the announcement of the contemplated erection of the new factory, the common stock of the United States Rubber Co. became very strong and scored an advance of 2½ points on investment and speculative buying.

THE RUBBER MARKET

New York, July 22—Crude rubber has been firmer in the markets than it has at any time during the past 3 months, and while trading this week has not been of large volume, holders have been able to work off some small lots of up-river fine at $1.18 a pound. Stocks in the hands of consumers are believed to be materially less than they were in June, which accounts for the strong undertone in the actual trading. The week-end imports totaled 1,304 packages, including considerable second-hand and waste material.

PRICE OF GASOLINE INCREASES

New York, July 23—Gasoline is now 16 cents a gallon, delivered in steel barrels in wholesale lots. The advance of 1 cent was announced last week, the quotations for 200-gallon lots being raised to 21 cents. The Standard Oil Co. explains the advance on the same old grounds, namely, the pressure of demand, the limited character of supply and the rise in basic oils. At the present level in wholesale lots, the price is higher than it was at retail last year at this time and is 7½ cents above the level established prior to July, 1911, and 6 cents more than it was January 1. The owner who can purchase in wholesale lots and who gets 8 miles to the gallon, can do a mile, as far as fuel is concerned, for 2 cents. If he is obliged to buy in lots of 200 gallons, the fuel cost per mile is 2⅝ cents.

DURYEA POWER CO. DECISION

Reading, Pa., July 22—Final distribution to the creditors of the Duryea Power Co. of this city, has been made. The sum involved was $1,156, the principal claims being by Joseph Middleby and H. M. Sternburgh. The United States supreme court heretofore decided that the claim of the Berks County Trust Co. against Mr. Sternburgh for $26,000 on stock subscription was invalid and the aforesaid claim was the chief asset of the defunct company.

FRANKLIN'S ANNUAL OUTING

Syracuse, N. Y., July 20—The eighth annual outing of the employes of the H. H. Franklin Mfg. Co., held at Long Branch today, was attended by 4,000 people, the factory being closed for the day. The attendance was 1,000 more than last year, till then the record. There was a ball game and many field sports were had, including fat men's races. C. E. Owens captured individual honors by winning several events. Cash prizes were given the first three men in all events. A band was in attendance and soloists sang from the balcony of the dance pavilion. A number of the officers of the company were present.

PORTABLE GARAGE BAN REMOVED

Milwaukee, Wis., July 22—After a hard battle, manufacturers of portable steel garages have won their fight against efforts made by the Milwaukee common council to prohibit the erection and use of such structures in Milwaukee. With the full consent of the chief of the fire department, as well as the Milwaukee board of fire underwriters, the council has just passed an ordinance amending the so-called garage law, permitting the use of the steel portables. The new section is as follows:

In lieu of fireproof construction a one-story garage may be built of incombustible material provided that the floor area does not exceed 360 square feet and the height does not exceed 15 feet, measured from the floor to a point two-thirds of the height of the roof, and that such garage does not form a part of any building and is not building; such garage than 1 foot from a adjoining premises or not more than one su on any 25-foot frontu and roof of such in consist of corrugated gauge, United States rust-resisting coating, framework, or may c of not less than 2 h metal lath with metal cases shall be of inc the doors shall be of wood and the windov metal with wire glass.

DEPARTMENT ST

New York, July 2 tion has been gr States district court Brothers, a New Y forbidding the co spark-plugs at less of the same general has been entered o ler & Co. against t Syndicate and Will dent.

ANOTHER REO DI

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y 22—Reports made ion of branch house the Thomas B. Jef- Wis., have just been at there was an in- in the sales of the lel over the sales of ilar horsepower and in the number of Kenosha over the per cent. The 1912 er 1911 in dollars 1-3 per cent. The of dealers was 105 luction of Rambler more than for 1912, n the two models Cross-Country and The Cross-Coun- notor rated at 38 tropolitan chassis or, rated at 45-50

L AGENTS

—Mitchell distrib- in the union at- convention at the factories in Ra- to study the new school conducted d promotion de- sent 189 branch state agents. 1913 cars have is known that many new and and lines, the g-stroke engine ge. Four chas- all four and a cylinders.

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—The Syracuse iation took a their annual week, the des- ls. The route run embraced ue scenery in Trenton Falls all game was Trenton Falls.

Road Sentiment Sweeps Illinois

Farmers Now Convinced Highways Improvement Is a Necessity —State Expects to Construct 100 Miles of Good Routes During Year—Great Enthusiasm in Small Towns

BLOOMINGTON, ILL., July 22—Hard road sentiment is sweeping over Illinois like an irresistible flood of public opinion. Nearly every farmer is a car owner now and so his views concerning improved highways have been subjected to a sharp revision. A few years ago it would have been difficult to have proven which was the more dangerous subject to mention at a farmers' institute, motor cars or hard roads. It was like shaking a red flag in front of a bull to allude to either. The times have changed, however, and the farmer good humoredly admits that he was wrong in both instances. Now, he has the car and he wants the roads.

A. N. Johnson, state highway engineer, asserts that the present year will be the most notable one in respect to hard roads Illinois has ever known. Nearly 100 miles of hard road are proposed, costing from $4,500 to $5,000 per mile to complete. Twelve hard road construction outfits, the property of the state highway commission, will have difficulty in coping with the era of hard road construction now in sight.

The entire quota of outfits is busy now and there are many other jobs in waiting. At the present time these outfits are at work at Bloomington, Pekin, Shermerville, Momence, Gibson City, Olney, Troy, Malta, Mattoon, Mt. Sterling and Sibley. Requests for state supervision of hard roads are on file from Effingham, Carbondale and Tuscola. The commission is supervising the construction of the equivalent of ⅔ of a mile of 12-foot concrete road at McLean, 10 miles south of here. A mile of concrete road is being laid at De Kalb and another mile is promised in Cook county along the line of the transcontinental road from Chicago to Clinton, Ia. At Carlinville the business men are building a mile of concrete road, 16 feet wide, extending west of that city. This road usually is impassable during the rainy season.

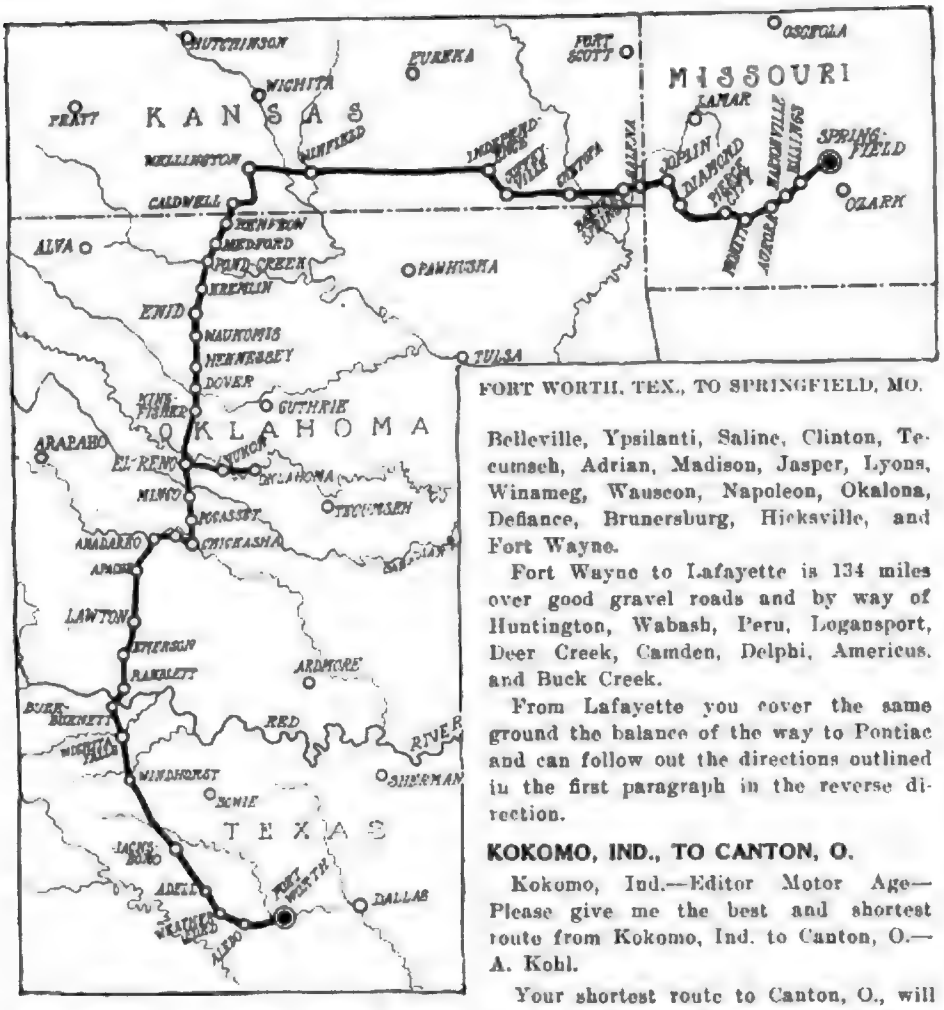
State Engineer Johnson has been attending a large number of farmers' institutes this year and hard roads furnished the principal topic. The basis of disposition of the motor car license fund is always taken up and given an animated discussion. There is no objection to the assignment of this fund to road improvement, the only difference relating to its restriction to main highways across the state or equal division among the counties. It is hoped to convince the farmers that it is wiser to put the money in a few state roads than to dissipate it by distribution among the numerous counties, giving but a few thousand dollars to each, which when spent upon the highways would make but a poor showing in the state.

LOUISIANA AROUSED

New Orleans, La., July 20—By far the most ambitious good roads plan that ever has been attempted in Louisiana is now being agitated in New Orleans and Baton Rouge. Efforts have been made in past years to build a road between New Orleans and the state capital that would be passable in all kinds of weather. Despite the thousands of dollars that have been spent in the last century on such a roadway none of the various efforts has been successful. The heavy rains and the difficulties in draining large sections have been difficulties calling for more money to overcome than has been available. Moreover, the Mississippi river serves the same territory and the fluvial highway has removed in a degree the necessity of a pike. The advent of motor cars, however, has caused a stronger demand than ever for the New Orleans-Baton Rouge model road. The plan has been submitted to the state engineers, which provides for the building of the road along the right of way of the Baton Rouge, Hammond and Eastern railway. In this way gravel, macadam and other constructional materials can be delivered at any point on the road with facility. This removes one of the causes for the failure of previous attempts where the cost of hauling material over the new roadway became so great as the road was built farther and farther away as to discourage the project. Another advantage is that the railway company is willing to provide for the drainage of the road, which can be done with little extra expense on their part, as they have their own roadbed to attend. This route will permit of using 30 miles of shell road already built between this city and Chef Monteur. It will be necessary to ferry at the Rigolets.

IDAHO INTERESTED

Twin Falls, Idaho, July 19.—The proposition of issuing $2,000,000 worth of state bonds for the construction of a main trunk line across the state, and important feeder branches, will be submitted to the Idaho legislature next year. The proposal will be backed by the Idaho State Automobile Association and its affiliated clubs. It is planned to model the bond issue along the lines of the New Jersey law, which provides for a tax on all motor cars in the state to pay the interest on the bonds, leaving ultimate redemption to the mass of taxpayers. The motor tax is to be graduated according to horsepower.



FORT WORTH, TEX., TO SPRINGFIELD, MO.

Chautauqua, Dewittville, Bemus Point, Greenhurst and Jamestown.

Buffalo can be reached through South Stockton, Cassadaga, Lilly Dale, Laona, Fredonia, Silver Creek, Irving, and Buffalo, 71 miles.

There is no reason why you should not go through Canada. The river road is taken out of Buffalo for Tonawanda and Niagara Falls, a distance of 22 miles. Here an Ontario license must be taken out costing you $4 and a deposit of $10 placed with the customs house broker, half of which is returned to you when you re-enter the states. Hamilton, Ont., is 51 miles from the Falls, routing through St. Davids, St. Catherines, Jordan, Beamsville, Grimsby, and Stony Creek.

Port Huron, Mich., is a distance of 143 miles and can be made the next night with London, Ont., your noon control. You will travel through Ancaster, Brantford, Woodstock, Ingersoll, Thamesford, London, Hyde Park, Adelaide, Warwick, Kertch, Sarnia and Port Huron. A run of 61 miles takes you to Detroit over gravel roads through St. Clair, Muttonville, and Mount Clemens.

As you do not state that you desire to return by way of Chicago, and your shortest way lies to Ft. Wayne, we are giving you that routing. This is 173 miles and takes you out of Michigan in a southwesterly direction through Dearborn, Wayne, Belleville, Ypsilanti, Saline, Clinton, Tecumseh, Adrian, Madison, Jasper, Lyons, Winameg, Wauseon, Napoleon, Okalona, Defiance, Brunersburg, Hicksville, and Fort Wayne.

Fort Wayne to Lafayette is 134 miles over good gravel roads and by way of Huntington, Wabash, Peru, Logansport, Deer Creek, Camden, Delphi, Americus, and Buck Creek.

From Lafayette you cover the same ground the balance of the way to Pontiac and can follow out the directions outlined in the first paragraph in the reverse direction.

KOKOMO, IND., TO CANTON, O.

Kokomo, Ind.—Editor Motor Age—Please give me the best and shortest route from Kokomo, Ind. to Canton, O.—A. Kohl.

Your shortest route to Canton, O., will be via Sycamore, Swazee, Marion, Montpelier, Keystone, Petroleum, Mercer, Spencerville, Lima, Ada, Forest, Upper Sandusky, Bucyrus, Galion, Mansfield, Wooster, and Massillon. You will have good gravel or stone road over level country all the way to Mansfield. East of Mansfield you will find the country quite hilly, and the road mainly natural dirt and clay. The mileage of the trip will be about 275 miles.

MUNCIE, IND., TO DETROIT

Muncie, Ind.—Editor Motor Age—Please state in Motor Age the best route from Muncie, Ind., to Detroit, Mich., and give conditions of the road and naming the towns passed through.—F. E. Henderson.

Running north from Muncie, you should have good gravel road all the way to Fort Wayne via Fairview, Petroleum and Bluffton, the distance being a trifle over 70 miles. Bearing to the northeast from Fort Wayne, good gravel or macadam will be found practically all of the way to Napoleon, the wayside points being Maysville, Hicksville—19 miles beyond Hicksville watch for sharp right turn taking the first one to the left which leads through old Brunnersburg—Defiance, Okalona and Napoleon. At this point your mileage will be about 136 miles. Wauseon, Ottokee, Lyons, Jasper, Adrian, Tecumseh and Clinton will be reached over good gravel practically all the way in Indiana, and fairly good gravel the rest of the way to Clinton.

There is good road from Clinton to Ypsilanti. Less than a mile out from Ypsilanti look out for sharp left turn over railroad bridge and immediately turn right, the road lying straight through Wayne and Dearborn to Detroit. This is the regular routing, but at the present time one detour is necessary on account of construction work, directions for which will be found in this issue under Road Conditions. Otherwise this stretch of road will be found very good, as there are many miles of macadam road out from Detroit. The total distance will be about 245 miles.

ARKANSAS TO MISSOURI

Helena, Ark.—Editor Motor Age—I am planning a trip to Kansas City via Joplin and Nevada, Mo. Please advise if there is a booklet or pamphlet issued showing the most desirable routes on western trips. Any information will be appreciated.—W. E. McFarland.

You undoubtedly know the road to Clarendon, at which point the ferry has to be employed to Roe. Leaving Roe the main road northwest into Hazen is taken, a distance of 20 miles. Little Rock is reached through Hazen, Prairie Center, Lonoke and Galloway. To Hot Springs, 54 miles, the roads are pretty good, routing via Collegeville, Benton, Fairplay, Lonesdale, Epps. Routing via Abernathy's Springs, you arrive in Mena and continuing to Fort Smith through Foran Gap, Chant, Boles, Waldron, Mansfield, Huntington and Greenwood.

An option on the above between Little Rock and Fort Smith lies through Palarm, Conway, Wooster, Plumerville, Morrellton, Atkins, Pottsville, Russellville, Dardanelle, Paris and Charleston. Your noon control can be at Russellville or Dardanelle. You will find mostly ordinary roads, some hills and some bottom lands, but none very bad and some of it fine. The routing from Conway to Plumerville by way of Wooster is 8 or 10 miles longer but avoids the Caddo bottoms.

Fort Smith to Neosho is 146 miles and can be made in a day with noon stop at Fayetteville. Cross the river over a fine bridge to Vanburen, routing to Winslow through the great orchards and cotton country. The Boston mountains, where the only grade of any note on the whole route is found, are next crossed and Fayetteville reached. Headed for Neosho you will have some macadam, some solid flint hills and some plain dirt—no bad grades or bad streams, however. The distance is about 84 miles through Johnson, Springdale, Lowell, Rogers, Bentonville, Centerton, Hiawassa, Pineville, Neosho. This can be made a night stop or Carthage, which is 20 miles further, on a fine road.

The distance to Kansas City is 185 miles. Through Jasper, Boston, Lamar, Irwin and Milo to Nevada the road is part oiled and part macadam and continues 20 miles to Butler. Butler to

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volume 5, and sells for $2.50. Inquiry will have to be made in every town for routing to the next. Motor car agents, repairmen or the hotels will give you the most authentic guidance.

HANOVER, ILL., HIS DESTINATION

Conrad, Ia.—Editor Motor Age—I wish to make a motor trip to Hanover, Ill., and would like to have the route outlined. I expect to start the last week in July and prefer passing through Cedar Rapids, Dubuque, and touch Galena. Which volume of the Blue Book describes the Iowa routes?—John Lister.

By going to Marshalltown you reach the official transcontinental route through Iowa and follow it to Cedar Rapids, a distance of 76 miles, through Montour, Tama, Belle Plaine, and 69 miles further through Marion, Mt. Vernon, Mechanicsville, Stanwood, Clarence, Lowden, Wheatland, Grand Mound, and DeWitt. You will have excellent views of the Mississippi river en route for Delmars, Maquoketa, Fulton, Lamotte, to Dubuque. Hanover is not far from Galena. Volume 5 Blue Book covers your routing in Iowa but does not deal with the territory east of the river except a few through routes to Chicago.

Reports on Condition of Western Touring Routes

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ists are advised in making the trip to Portage and east from Kilbourn to go via Baraboo under present conditions.

Portage to Madison—Generally good, only a little sand, the last half of the route being particularly good.

Madison to Freeport, via Monroe—The first part of this route is identical with the present routing to Evansville, where it branches to the southwest for Monroe, then almost straight south into Freeport. It is gravel most of the way to Evansville, with generally good dirt and some gravel the rest of the way, although quite hilly most of the distance between Evansville and Freeport.

Freeport to Rockford—This route was found to be in better shape than last year and the only feasible one between these two cities.

Rockford to Elgin via Cherry Valley—This is a new route. Leaving Blue Book route just south of Belvidere, keep straight east instead of turning north into the latter town following. There is gravel on the direct road through Genoa and Pingree Grove, coming into Elgin on the south leg of the Elgin race course.

Elgin to Chicago on what is known as the Chicago avenue route—Gravel or macadam all the way, in generally good condition.

Chicago to South Bend—Due to construction of new railroad bridge and road improvement between Highland and Hobart, those desiring to go to South Bend via Valparaiso and Laporte are recommended to follow route 51 to Valparaiso. It is possible to follow route 1 to the first left-hand road just after passing through Hessville, where turn left about 2 miles, then south, meeting the Hobart road again, but due to road improvements east of this point another slight detour must be made, and the above recommendation of route 51 is considered best. It also is necessary at Laporte to make a detour between this city and South Bend, as this part of the road will be closed for some weeks. The Blue Book car went via Stilwell, going southeast out of Laporte on Monroe street, crossing the river at Stilwell, following the heavy telephone line direct into South Bend. Some dirt road but a good route in dry weather.

Chicago to South Bend via Michigan City is reported in good condition, particularly to Rolling Prairie, where the macadam ends. From here on there are a few short stretches of soft gravel, but same are not bad.

South Bend to Muskegon—Fairly good to St. Joe, with gravel to Niles, a few sandy spots to Arden, then macadam. After leaving St. Joe there is considerable sand, with some rough stretches. They are just commencing to gravel the roads in this section and it is hoped that considerable improvement will be made by next summer.

A new route from Holland to Kalamazoo gives good roads with considerable gravel especially between Allegham and Kalamazoo.

Holland to Zeeland and Grand Rapids was found to be the best between these two cities, and roads practically all the way are gravel and in good shape.

Grand Rapids to Traverse City. Grand Rapids to Big Rapids is good with the exception of last 10 miles, which are rather rough and sandy in spots. Big Rapids to Reed City is good all the way, but from Reed City to Tustin the roads are hilly and sandy, with some clay on hills and some very rough spots. From Cadillac north, conditions are much better, with considerable macadam. There is no sand of any consequence.

General road conditions north of Muskegon and Grand Rapids are as bad as they have been in 2 or 3 years. Of course where road improvements have been put in conditions are excellent, but the sandy stretches almost spoil the general effect over a large number of routes. The sand probably is especially bad this summer, due to the excessive dry spell after a wet spring.

Cadillac to Manistee—The people in Cadillac advise that on the Cadillac-Manistee route it is perfectly feasible to go straight across country but although the first part of the way is not bad the last half is winding through woods over some bad sand hills and tourists are advised to go north from Cadillac to Sherman, then across to Copemish and south into Manistee. They now are working on this stretch and it is promised that improvements will put it in fairly good shape with considerable gravel for next year.

Manistee to Traverse City via Arcadia and Frankfort is fairly good going to Frankfort but practically impossible to go farther north. The Blue Book car made a connection direct from Frankfort to Traverse City via Benzonia and Grawn. This is a feasible route which is being worked on and which will be finished for 1913, it is claimed.

Thomas H. MacDonald, highway engineer for Iowa, reports that there is considerable improvement being made on the official transcontinental road as it passes through the Iowa state college grounds at Ames. None of the roads is closed, but due to grading and new material being put on they will be rather rough for a short time. Due to a new bridge which is being built over the Raccoon River just west of Jefferson it is necessary to go around on a temporary bridge, which should be taken at slow speed with careful driving. When completed the new bridge will be one of the finest of its kind in the state.

Port Huron to Detroit is a mixture of some excellent roads with a few poor stretches. The regular Blue Book route as far as St. Clair is all right. At this point a new route was taken via Marine City, Anchorville and New Baltimore which is good to Marine City and fair to Mt. Clemens, a little sand and some clay. Road through Mt. Clemens is pretty bad until you meet the new concrete macadam on Gratiot avenue.

The route between Detroit and Ann Arbor is being put in excellent shape, as the new concrete macadam, which will all be completed this summer, reaches nearly to Ypsilanti and the road from there to Ann Arbor is fine gravel. There is one detour, however, still necessary between Detroit and Ypsilanti. Nine miles out of Detroit turn right on a clay road for nearly 2 miles, where turn sharp left, crossing a small iron bridge; go 1.2 miles and turn left, meeting the regular route again at the Sanitarium, where right turn is made for Ypsilanti. Straight route through here will not be open until November.

Ann Arbor to Brighton is a very useful short connection between the two main east and west routes across southern Michigan. The road passes close to Whitmore Lake, to which point it is good gravel. The rest of the way there is a little sand but considerably more gravel.

New Hudson to Pontiac and Mt. Clemens is good to Orchard Lake and excellent from there to Pontiac on fine macadam. This short stretch is quite a scenic one. From Pontiac east the road is fine to Utica, and almost as good from there on via Frazier.

Colonel Ruffum, the good roads man of Missouri, advises that, due to the hills and generally bad condition of the road between Rennick and Armstrong on the Mexico-Marshall route, it is advisable to go northwest from Rennick 7 miles to Moberly; from here west to Huntsville 6.8 miles, then south to Mt. Airy, 6.1 miles from Huntsville, continuing south to Roanoke 5.5 miles and turn west, meeting Blue Book route, into Armstrong. This option is less than 4 miles longer than the route through Higbee.

The Readers'

Change-Speed Gear Design Under Discussion—Cameron's Communication on Four Versus Three Speeds Cause of Comment from Engineers—Divergent Opinions

Number of Speed Changes

Engineer of National Factory Holds Four Speeds Necessary Only If Car Underpowered

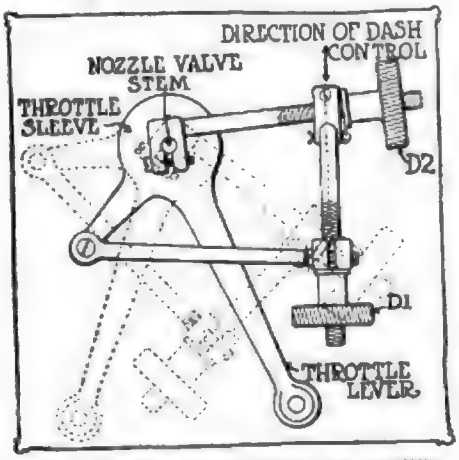


FIG. 1—CHADWICK THROTTLE LEVERS

INDIANAPOLIS, Ind.—Editor Motor Age—I note with considerable interest an article in one of the recent issues of Motor Age, claiming the four-speed gearset was the proper one to use and had a great many advantages over the three-speed. I can readily see, assuming the same premises, that without carefully reasoning, this conclusion might be reached.

Assuming that all cars were very much under-powered, this conclusion might not be far off. This certainly is not the case, however, in this country. I believe that the American public does not care, as a rule, to work its passage in driving a car, and the less gear-changing necessary the better. What one desires in a car besides comfort is quiet running and simplicity. Quiet running can be best secured by using direct drive. Simplicity is approached the nearer by using as few a number of gear changes as possible.

For a car very much underpowered a four-speed gearset might have some advantages, provided the driver was willing to be continually changing his gears. A car of the proper proportion of power to weight should be able to go over most roads on direct drive, having an engine flexible enough and with sufficient power to throttle down to low speed and at the same time prevent stalling. The way to view the matter is to consider the gear-box as an undesirable but necessary adjunct of the hydrocarbon engine. If the engine was a perfect source of power, the gearset could be done away with entirely. As this is not the case, it is necessary to use certain gear reductions, which causes the necessity of the gearset. The simpler this gearset can be made the better. Also the greater the amount of time the direct drive in this gearset can be used the greater its efficiency, whereas the engine efficiency does not vary a great deal except at low speeds. If the three-speed gear box is made with anything like the correct proportion of gears, it is as flexible as can be desired and I believe the correct proportion runs something as follows: The rear axle gearing, of course, could be anything desired; assuming in this instance it was 3 to 1 would give

	Gear box	Engine to wheels
Third or direct drive	1 to 1	3 to 1
Second or intermediate	1.6 to 1	4.8 to 1
First or low	3.25 to 1	9.75 to 1
Reverse	4.5 to 1	13.5 to 1

You can see from this that the intermediate speed is sufficiently high so that good results and a very fair road speed can be gotten, especially for grade-climbing by the use of this, whereas for extremely hard pulling, the low speed would come in use as would be the case with the four-speed gearset. Of course, the size of the engine in proportion to the weight of car has to be considered to a certain extent. An engine of the proper size for the car does not necessarily mean a large engine. It simply means that the designer must have done his work well in proportioning the parts.

In certain countries abroad where a tax is levied on the horsepower of an engine there necessarily is some reason for keeping down the horsepower, although they are going to extremes in this matter, which the motor car users of this country would hardly put up with. In fact, I have ridden in good makes of cars abroad, where it was necessary even on good roads to shift gears from high speed on grades not much over 2 per cent. Of course, if you are determined that your chauffeur shall earn every last penny of his wages a four-speed gearset is an excellent device, provided you make him use all the speeds, and why have speeds unless you expect to use them?

Most drivers seldom use more than two of their speeds, whether they have a three or a four-speed gearset. The slide-gear transmission is a very poor proposition and considerable of a makeshift from a mechanical standpoint. Why complicate and add more weight to it and render it more liable to get out of order?

The American public does not wish to be continually changing gears, which is proven by the fact that each year the manufacturers of cars increase slightly the sizes of their engines. This is not so much to secure greater speed as it is to secure ease in hill-climbing and the elimination of the necessity of changing gears.—William G. Wall, National Motor Vehicle Co.

Pound Is a Good Sign

If Impossible to Get Knock With Full Load, Timing Is Wrong Magneto Adjustment

KENNEDY, MINN.—Editor Motor Age—I have read carefully the article on "The Theory of Spark Advance" in the June 13 issue, page 31, of Motor Age. I have a model 10 Buick, equipped with a type L Remy magneto, and would greatly appreciate some information in regard to the ignition and carburation. On the Remy there is a stop on the timer so it cannot be worked beyond a certain limit. On a late spark I set it to ignite on center and there get a good spark but as it is advanced the spark grows weaker and at the extreme limit there is no spark at all. Now it must be that the armature is not in the right position to cut sufficient lines of force; but what has changed it? The cam in the breaker-box is keyed to the armature shaft so this ought not to exist, the magneto cannot be weak as it produces, on retard, a spark ⅜-inch to ½-inch long.

2.—In this same article it states to advance the spark until it nearly pounds in the motor, I can advance it, on battery ignition, to the limit without pounding. Is this on account of a slow-burning mixture?

1.—Your trouble is with the adjustment of the platinum points. In Fig. 3 is shown a diagram of the Remy breaker-box as applied to a model L. With the cam in the position shown, there should be 1-32-inch clearance at A between the short breaker arm and the flat spring. This adjustment is made by pressing in the phosphor bronze spring and turning the hard rubber adjusting screw R to the right. The reason for your lack of spark at advanced positions is that, owing to the platinum point, P, being worn, the breaker arm B breaks its contact with the spring, S too soon, so that no current is generated. If this does not suffice, the cam is worn, and should be replaced.

2—If you cannot get a pound with spark fully advanced, and under heavy load, as on a hill, your spark timing is too late. With retard on center, or just a shade after, you should have sufficient advance to make the motor pound even without a load, although in active running so much advance is unnecessary.

Clearing House

Fergusson Comes to Defense of Michigan Factory Man on Transmission Questions—Methods and Plant for Enamelling Lamps—Side Swing in Underslung

Enamelling Brass Lamps

Best Methods of Applying Permanent Coating Outlined for Hoosier

INDIANAPOLIS, Ind.—Editor Motor Age—Being desirous of engaging in the business of enameling brass lamps for my customers, I would appreciate a brief outline, through the columns of the Reader's Clearing House, of the machinery necessary for this work, and the method of procedure.—F. M. Leary.

The machinery required is one or more high-speed buffing stocks, the number depending upon the amount of work to be done, and the number of men to use them. The balance of the equipment consists of an oven, a size of 7 feet high, 6 feet long, and 6 feet wide, being adapted to all average uses. It should be made of sheet steel, and covered 1 inch thick with asbestos. This oven is fitted with four or five steel racks or shelves on the interior, and a well-fitting heat-tight door. A thermometer is encased on the outside, having connection with the interior through an iron tube. The oven may be heated with steam, electricity, or gas, and should be kept at about 200 degrees temperature. Such an oven can be built for about $60, and a gas burner that has been found very satisfactory can be purchased of the Fowler Lamp Mfg. Co. of Chicago for $20. This burner is composed of two iron pipes, with opposing slots, which act as jets, the large diameter of the pipes in conjunction with the blast induced by the rush of gas through the apertures make a very hot blaze with good economy.

The process is as follows: The doors and all free parts of the lamps are first removed, the lens-mirrors or silver reflectors being left in the lamps, as the heat of the oven is not sufficient to injure these parts. All parts to be finished bright are buffed and colored on the buffing wheel, while the parts to be enameled are roughened on a scratch-press wheel, operated at approximately 2,200 revolutions per minute, and then wiped with benzine on a soft cloth, care being taken not to touch any of the surfaces with the fingers, as spots so blemished will blister in baking.

The first application of enamel is then applied with a ¾-inch flat badger's hair brush, the lamp being placed in the oven for from 1½ to 2 hours. Some jobs require two coats and some three, the enamel recommended being the Chicago Varnish Co's. Rubber Finish baking enamel, which comes in large tins, ready to use. The first application always is dull finish, while the final coat may be either of dull or luster finish, according to the tastes of the customer. The enamel is baked after each application, and considerable skill is required to apply the enamel.

Large surfaces are best enameled one at a time, being kept horizontal, as otherwise the enamel will run on the vertical faces, and produce an uneven surface. Electric lamps, speedometers, and electric signals all must have wiring, celluloid, rubber, and composition parts removed before baking. Solder, however, is not affected by the temperature of the oven. The heads of the lamps and the oil pots should not be enameled, as the heat will cause the enamel to blister, and the kerosene will cut it. In buffing and coloring the bright parts, Tripoli buffing composition should be applied to the buffing wheels for cleaning.

Other methods than the one outlined have been tried. Dipping is used to some extent, but owing to the uneven surface it produces and the fact that all interior parts must be removed to prevent them being covered with the enamel, this is not to be recommended. Its durability is also very inferior. The sand blast method of scratching also has been experimented with, but with ill success, as the sand will remain in the crevices in spite of all precautions, and sift on to the enamel. The spray method of applying the enamel is economical only when done on a large scale, and the result is superior to the method described only in points of economy. Some manufacturers using the method described find that they can guarantee their work for 1 year against the action of the sun, checking and blistering.

CARBURETER ADJUSTMENT SAME

Powder Springs, Ga.—Editor Motor Age—Tell me how to adjust the Schebler model L carbureter. This information was given in a former issue of Motor Age but it was for the Cadillac car with new electric lighting and starting device. Will these adjustments hold good for this carbureter on a Maxwell Mascotte car?—S. E. Smith.

Yes; the adjustment of the carbureter on the Cadillac car is applicable to the carbureter on the Maxwell Mascotte car.

In Favor of Four Speeds

Pierce-Arrow Expert Agrees with Engineer Cameron in Design—Ability of Extra Ratio

BUFFALO, N. Y.—Editor Motor Age—I quite agree with W. H. Cameron in regard to the desirability of a four-speed forward gear box on all touring cars, except, perhaps, the very smallest powered cars. I am altogether in favor of direct drive on fourth speed. I favor a lower third speed gear ratio than Mr. Cameron advises, the other gear ratios are about the same as those used by the Pierce-Arrow car, which in the case of the 36-horsepower car has the following gear ratio:

Speed	Transmission ratios	Ratio Engine to wheels
4	1 to 1	3.5
3	1.63 to 1	5.7
2	2.22 to 1	7.77
1	3.88 to 1	13.58
Reverse	4.66 to 1	16.31

I consider that in order to get the full benefit from a four-speed gear, the third speed must be low, as the ordinary driver will, as a rule, keep on the direct when climbing a hill as long as possible, the engine will then have slowed down so much that by the time the driver has changed to third speed he will find the car speed so slow that the engine will not pick up speed, with the result that he either will stall the engine or he will have to make a quick change into second. This detracts from the value of a four-speed gear, and he will find that there are very few hills that he fails to get up on the direct, that he will be able to make on the third, unless he changed to the third while the car is still going along at a good rate of speed on the fourth.

This is especially true in the case of heavy, powerful cars as almost all drivers endeavor to make a hill on the direct drive and they delay changing gears until the last moment. With a properly proportioned four-speed gearbox the driver can

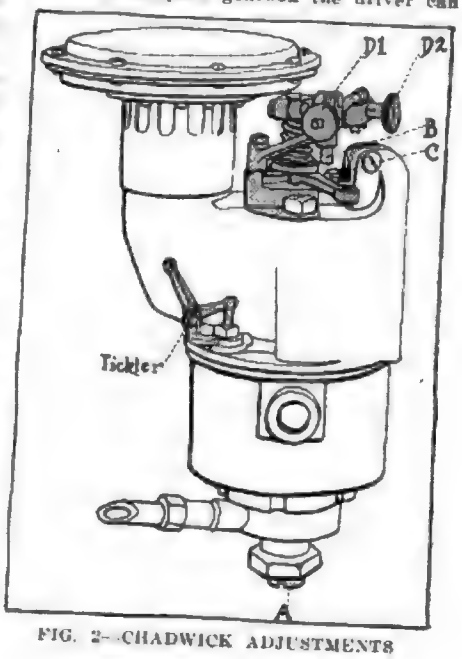


FIG. 2—CHADWICK ADJUSTMENTS

# of Underslung Stability Asked

er of Weight Alone Does Not Solve Problem—Chadwick Carbureter Adjustments

are preventable with of the controls.

ylinder, four-cycle motor, distributor may be used cylinders, by running it eed, timing the spark to nusly in both cylinders, park in a given cylinder, he exhaust stroke. See

timer runs at half time, and if wired to but one would occur only on ke of one cylinder, and troke of the other, the ing cut out of ignition.

reason as above, with on the half-time shaft, occur in either cylinder e every other revolu-

tute, of Chicago, gives nechanical engineering, nted with a special g course. Correspon- as the International ools, of Scranton, Pa., School of Correspon- ndo special motor car icula.

g school is the Chi- ring, Chicago.

k 1910 carbureter, red by the Chadwick ts four adjustments, ve, the dash adjust- top, and the adjust- ronous nozzle valve s. In Fig. 2 is a se adjustments, in le valve adjustment. e given this adjust- as with the metal ice set is permanent in a small window in the side. B is the fulcrum, to which the dash adjusting control is attached. This adjustment is for the purpose of raising or lowering the needle valve of the nozzle, independent of its movement as governed by the throttle. It operates direct on the projecting stem of a screw plug which is connected to the needle valve, and raises or lowers the latter as it turns.

The throttle stop C limits the degree of opening of the throttle, and consists of the usual slotted and threaded lug, in which the stop screw is screwed, and a binding screw to clamp the two sides of the slotted lug together, when the adjustment is set. D-1 and D-2 are the adjusting nuts of the syncronizing throttle and nozzle control levers. These levers number three, the first being clamped to the stem of the nozzle valve, and connected to the third by a second. The third is screwed to a bell crank which is part of the throttle lever.

In operation, the opening of the throttle, from right to left, turns the nozzle valve stem by means of these levers, raising the needle and admitting more gasoline in proportion to the opening of the throttle. Adjustment of these levers is for the purpose of varying the proportions of gasoline and air at any given speed, and to govern the rate of opening of the needle valve of the nozzle, in proportion to the movement of the throttle. Turning D-2 to the right increases the range of opening of this valve, and to the left, decreases it. Turning D-1 to the right or left varies the degree of opening in proportion to throttling.

The plan of these levers may be studied in Fig. 1, which illustrates the manner in which the dash adjustment is accomplished with the same levers without any effect on the throttle. To secure a richer mixture on high speeds and a leaner one on lower speeds, turn nut D-1 to the right. To secure the opposite adjustment, turn it to the left. To enrich the mixture on all speeds, turn nut D-2 to the right, and to cut down on all speeds, turn it to the left. Experience will show that adjustments must be made in conjunction with one another. For ordinary work, this adjustment should be made with the dash control in a neutral position, so as to allow instant dash adjustment in either direction.

Chadwick touring cars have made as high as 74 miles per hour on top speed, it is claimed. Chadwick gearing is optional.

9—The correct ratio of 17:53 is 3:1176+, which is approximately 3⅛.

10—Alcohol and water will be found satisfactory as a non-freezing solution for use in gas generators.

UNDERSLUNG SIDE-SWING

Hannibal, Mo.—Editor Motor Age—Will Motor Age kindly advise me if a car with an underslung frame has less side-swing and steers easier when running rapidly than drop frame cars?—C. A. Trowbridge.

The underslung frame is credited with having less side-swing, all other things being equal, than an overhung, even though the latter frame be considerably dropped. This is due to the fact that the center of weight, in the best examples of underslung practice, is practically at the same height as the spindles of the wheels, hence the centrifugal strain exerted in rounding corners, etc., is applied equally on both wheels, the strain on the springs being lateral, and about even; hence there is no give, and the body is held practically rigid against all lateral motion.

The overhung frame carries its center of weight higher than the underslung, hence centrifugal strain is exerted above the spindles, unevenly on the wheels, and vertically on the springs, which are flexible in this direction, and give to the pressure of the body, causing side-swing. Even though the center of weight of the overhung by means of excessive drop, were brought as low as that of the underslung, its high suspension would induce

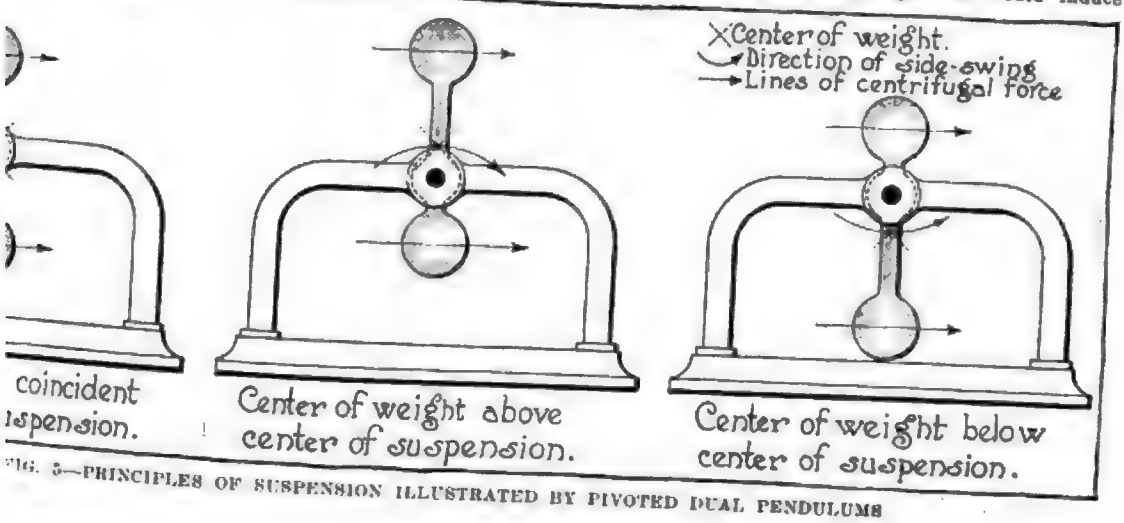


FIG. 3—PRINCIPLES OF SUSPENSION ILLUSTRATED BY PIVOTED DUAL PENDULUMS

side-swing. In Fig. 5 is shown a double pendulum in three positions, representing this principle: A representing the underslung principle, B the overhung with high center of weight, and C the overhung drop-frame suspension with low center of weight. The identity of this principle in its application to motor car suspension is clearly shown in Fig. 4.

The uniform pressure on the wheels,

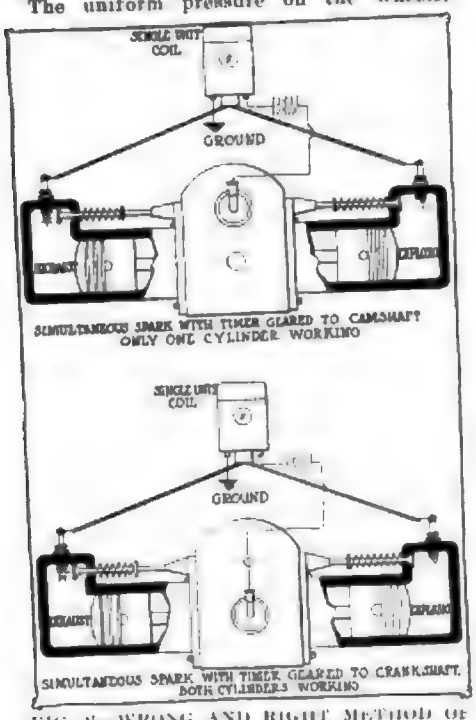


FIG. 6—WRONG AND RIGHT METHOD OF TIMING FOR SIMULTANEOUS SPARK

which is a feature of underslung construction, is the result of the coincidence of the center of weight, the center of support and the center of suspension. The uneven pressure on the wheels of an overhung car is the result of differentiation between these centers. It follows that with this uneven pressure, the wheels of an overhung vehicle would steer less easily at speed, when the tendency to side-swing is greatest.

HENDERSON LIGHTING SYSTEM

Omaha, Neb.—Editor Motor Age—I understand that the Ward-Leonard lighting system, as applied to the new Henderson product, depends upon the batteries to light the car at night, charging only during the day. If this is true, owners whose driving is principally after sunset, would find the charging generator of little use. —Night Rider.

At speeds below 12 miles per hour, there is no output from the Ward-Leonard generator; at 12½ miles per hour it will take the entire side and tail lamp load, and at 17½ miles, will take the entire lighting load. This is shown fully in the accompanying chart, Fig. 7, which was plotted from tests conducted by the Henderson engineering department.

If the car were run with all lamps lit, an average speed of 17½ miles per hour would keep the batteries fully charged at all times. If the average speed were less than this, they would require occasional recharging, although if this average did not fall below 12½ miles, such recharges would be extremely infrequent, as only sufficient discharge to light the headlights would be sustained in excess of the recharge from the dynamo.

This condition would not be likely to occur with even the slowest of night drivers, and would in all likelihood, be made up for by the moments of idle running, when the entire output of the motor would be absorbed by the batteries. The average driver, however, drives at a much greater

Duryea Cites Two-Cycle Efficiency

Maker of Buggyaut Defends Position on Power and Fuel Economy of Two-Stroke Design

SAGINAW, MICH.—Editor Motor Age—Mr. Sheehy's remarks on the two-cycle motor in the last issue of Motor Age are noted. I regret to disagree with him, but the two-cycle engine is too good a device to be ignored by motor car makers and users, so perhaps a few further remarks will be of interest to the readers of Motor Age.

My previous article tried to make it plain that the two-cycle does not draw in twice as much fuel as the four-cycle and so cannot be expected to give twice as much power. Any one can see that the crankcase of an engine cannot be as good for pumping in the new charge as is the cylinder of the four-cycle during its non-working stroke and that even this is not a real good pump as is shown by the fact that it never gets properly filled at high speeds.

This one fact alone is mostly responsible for the difference between the two types of engines. When the two-cycle runs slowly it pumps nearly full charges and develops better power than most four-cycle engines of twice that number of cylinders. This because it has less internal friction. It will hand to its job and not lie down as many four-cycle engines do. But at speed it does not get full charges and so cannot develop anywhere near double power. On this account the statements of Mr. Sheehy as to high speeds are largely true. But evidently he has something to learn about two-cycle speeds, however, or he would not claim that it is "not impractical to run them much above 1500." Our engines test up to 1,200 to 1,500 before reaching their maximum power point and they decrease slowly above that. They will turn above 2,000 while pushing a rig at high gear along the road and can be easily tuned to run much faster than this, but we have no need for such speeds with solid-tired vehicles and so we design for lower speeds rather than for higher ones. We are certain there is no difficulty in running our engines up to 3,000 if we had need for them to operate at such speed. We are a little proud of this fact, for we use a check valve into the crankcase, and check valves are supposed to slow the speed of a two-cycle, but we stand ready to produce the engine whenever there is any occasion or demand for it evidenced.

Mr. Sheehy also is wrong in the matter of cooling, and evidently does not speak from a proper experience. I once held the same belief, but several years marketing an air-cooled two-cycle, built with the same cooling system that I formerly built on four-cycles, has convinced me that the two-cycle does really cool easier than the four-cycle, and the only explanation I have been able to find is the one given in my letter of May 23. I will enlarge on this slightly for a better understanding.

Assuming that the ignition begins at dead center, although in many cases the heat has not developed nor the pressure risen until somewhat later, it is evident that the walls are exposed to heat for only about 120 degrees, because the average two-cycle opens its exhaust earlier than does the four-cycle—we open our exhaust somewhat later than this because we are building for pulling and not for speed, having more speed than we need already. This means that the wall is exposed to the heat for 120 degrees and the inlet opens admitting cool gas within another 15 or 20 degrees, during which time the exhaust gases have completely escaped through the extra large opening provided by the piston opened ports. The four-cycle people are considering sleeve valves, rotary valves, and other means of getting this perfect port action, which in itself is a large cooling feature. It is likely, therefore, that the average heating time is not more than 130 degrees, while in the four-cycle the exhaust opens at 40 or 45 degrees ahead of dead center, so that the intense heat of the charge is against the wall for 135 to 140 degrees, followed by a somewhat less intense heat until the end of the exhaust stroke, 220 or 225 degrees further, or a total of 360 or 365 degrees. It will thus be seen that this time of exposure to the hot gases is nearly three times as long as is the case in the two-cycle, per ignition, but since the latter part of the exposure in the four-cycle is not so intense, we may consider it as probably not more than equivalent to the earlier exposure. Roughly, therefore, we may say that while the two-cycle is exposed twice as often to the heat, the four-cycle is exposed twice as long, and the difference in heating is not as great as may be imagined.

Adherent to Rarer Type of Engine

Correspondent Comes Back at Sheehy on Comparison of Motors with Four-Cycle Principle

Practically, there is another element entering, which is the time required for the heat to be conducted from the inner surface of the cylinder wall, to the outer surface. It is certain that the heat to be carried away by the cooling means cannot be more than that which goes through the wall, and whereas the four-cycle, having no fresh gas immediately after the opening of the exhaust, allows the heat to pass through the wall. In the two-cycle this is not true, because at 130 to 140 degrees from the beginning of the heating, cool fresh gas is thrown against the walls and draws the heat from the inner surface before it has time to pass through to the outer surface. It not only lessens the need for cooling on the outside, but it is a source of economy on the inside for any heat which goes through the wall is lost, whereas all the heat that can be kept inside is a possible source of power.

I believe, in this connection, that any engine should be run as hot as it can be properly lubricated, and that it is more important to run the two-cycle hot than the four-cycle, in order to save and utilize this heat which would otherwise be carried through the walls and dissipated by the cooling means. We, therefore, employ a very high fire test oil which we consider essential with our engines.

Mr. Sheehy also is in fault when he says that because a two-cycle fires twice as often it should give twice the power. This is incorrect for two reasons; first, because the two-cycle practically never gets charges as large as the four-cycle, owing to the lower efficiency of its pumping means, and because the two-cycle does not compress the whole length of the stroke as does the four-cycle. With an exhaust port opening 60 degrees ahead of dead center, it is quite evident that compression cannot begin until the piston has traveled up about one-fourth of its stroke, so that really the compression stroke length of the two-cycle is about three-fourths the length of the four-cycle engine. On this account a smaller firing chamber should be used in order to get the same amount of compression, and it is evident that the same amount of working charge is not used in the two-cycle that is used in the four-cycle. In other words, with a given bore and stroke, the two-cycle is a simpler and a smaller engine, and if proper comparison is to be made, it should have slightly larger bore and stroke. It then will use substantially twice the fuel, and develop substantially twice the power. The usual comparison fails to take into consideration these facts, and is misleading and unfair.

This shorter compression stroke contains another thought which is that with proper deflector or arrangement for putting the new charge above the old one, the closing of the exhaust port expels practically all the remaining burned gases, so that the two-cycle works with a purer and more powerful mixture when it is taking full charges and this is one reason why it pulls so well under such conditions. The four-cycle, on the contrary, always contains a firing chamber content of burned gas. As shown before, however, few engines work under full throttle, and if but a small charge is introduced, there is little danger of any of it escaping with the exhaust. The result, therefore, is as great or greater economy than with a four-cycle.

What Mr. Sheehy says about the pressures always being against the connecting rod is quite true, and except when starting, a loose connecting rod bearing cannot be heard, for there is no throwing of the piston under an idle stroke as in the four-cycle, and this fact is worth as much to the car user as it is to the boat user, and will, sooner or later, be a good reason in favor of buying a two-cycle engine. Not only does the connecting rod require less care and stand more abuse, but the other parts which make the four-cycle so complicated simply do not exist on the two-cycle. Mr. Sheehy is quite right that if maximum power alone is considered, the four-cylinders, four-cycle will give more than the two-cylinder, two-cycle, but mose users are not much interested in the maximum performance of their engines, although they buy their cars on this rating. Let us hope that the time will come when users will insist on getting, and makers will supply, engines with power rating at an average or common working speed.—Charles E. Duryea.

COMPARATIVE POWER

St. Joseph, Mo. — Editor Motor Age— Which cylinder has more power of the same bore and stroke, a Buick or a Cadillac?

2—Which cylinder has more power, a valve-in-the-head, or a T-head?—Oscar F. Riemer.

1—The bore and stroke of the Cadillac motor is 4½ by 4½, and the nearest corresponding size in the Buick line measures 4¼ by 4½. The S. A. E. rating gives the Cadillac motor 32.4 horsepower, and it is claimed to deliver 39.5 at 1500 revolutions per minute, on the brake. The Buick motor acording to the S. A. E. rates at 28.9 horsepower, and is said to develop 39 B. horsepower at 1200 revolutions.

2—It is generally conceded that, owing to the shape of the combustion chamber, the valve-in-head motor will deliver more power for given piston speed and displacement, than the T-head type.

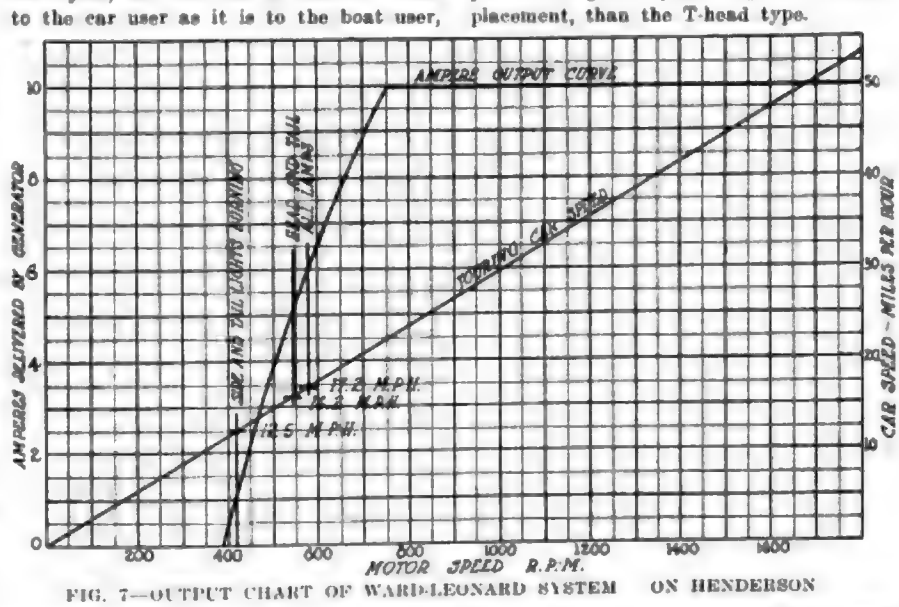


FIG. 7—OUTPUT CHART OF WARD-LEONARD SYSTEM ON HENDERSON

average speed than this, especially at night and in the open country, and by far the greater proportion of the actual running of the motor is done without the lamps being lighted.

At speeds, above 17½ miles per hour, even with all lamps alight, the output of the generator exceeds the consumption of the lamps, and the batteries are thus charged constantly during such speeds. This results, of course in very soon exceeding the normal charge; but it is claimed by the maker of the batteries used on Henderson cars, the Willard Storage Battery Co., that owing to the vibration of the car, the gas-bubbles, resultant from overcharge, are shaken off, with the result that no damage is sustained by the battery. In fact it is the maker's assertion that such overchage is actually beneficial to the battery.

The Motor Car Repair Shop

Magneto Repairing

a time when the manufac- magnetos and such instru- or less complicated nature, the less an operator of a of these mechanisms, the would be to attempt its re- ment, and that thus many equent damage to the ma- be avoided. It has been er, that this theory is in- stead of immediately send- nent back to the manufac- was suspected of being in ment or repair, no self-re- rman would return the me- e maker until he had first and assembled it again in d the cause of the trouble.

repairman realizes that he know how to make minor justments on a magneto, and learns to do this the better s gratifying to note that the ent manufacturers of mag- hanged their policies in this that they are now issuing ooks containing excellent de- illustrations relative to the of their mechanisms, and that s being made to promote the the owner and repairman in adjustment of their magnetos. etos nowadays are of marked far as these features are con- are apt to require attention These features are the ing mechanism, and the dis- he circuit-breaker is the me- comprises the little platinum ts, which sometimes become or burnt and pitted, so that stick together occasionally or e good contact. This condi- contact points causes misfiring, ion of the motor and car.

it-breaker of a magneto gen- cated at the rear end of the aft, and it is protected in the agneto by a brass or aluminum r. This mechanism should be the contact points should be arallel with each other; and be adjusted so that they open inch, which is equal to the of an ordinary business card. these contact points can be inserting a piece of paper be- n, closing the points down onto lightly, and then moving the t between them.

een stated in a number of pub- hat if the contact points be- d, they should be dressed down ng a thin smooth file or emery een them and then sliding them forth between them. This advice, though apparently good, has led many a motorist and repairman to do more harm than good to the points of a magneto. It is impossible to obtain a file thin enough to dress down the contact points as above described without destroying the parallelism of the contact surfaces.

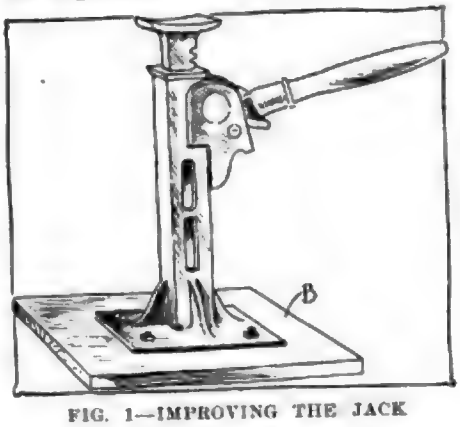


FIG. 1—IMPROVING THE JACK

Pitting of the contact points of a magneto, generally occurs on those mechanisms which are used in connection with dual ignition systems; systems in which a storage battery or a set of dry cells is employed to produce the hot spark required to start the motor. In such systems, the battery current usually is so strong it has a tendency to burn the contact points very rapidly, and especially when the operator neglects to switch from the battery onto the magneto immediately the motor is started. Many motorists very often forget to switch over onto the magneto, and run for hours at a time on the battery, which of course, uses up the energy of the battery and is detrimental to the contact points as well.

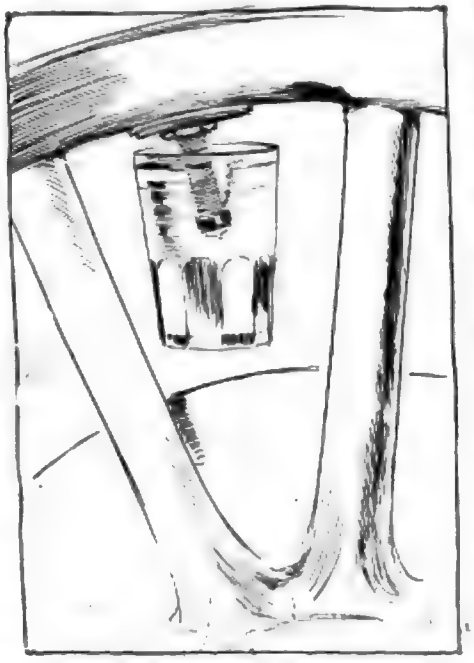


FIG. 2—TESTING A TIRE VALVE

A good way of dressing down the contact points of a magneto circuit-breaker, is to remove them from the mechanism, together with the lever and screw to which they are secured, and center them in a lathe. The points held in the lever may have to be smoothed down by hand, because it cannot be chucked in a lathe conveniently, but the point in the adjusting screw, may be held fast in a self-centering chuck in the revolving spindle of the lathe, and the lathe started. A very smooth flat file, with its two broad sides parallel, should then be held flat against the spindle of the tail-stock so that when it is moved toward the revolving spindle the face of the file will be parallel with the face of the contact point; then, by forcing the file lightly against the contact point it can be quickly and accurately milled down.

Improving the Jack

In Fig. 1 is shown how several of the jacks used at the repair pits during the last great race at the Indianapolis speedway, were rendered more substantial. They were simply secured to a block of hard wood B about 2 inches thick and as broad and long as would conveniently fit under the car. Many repairmen and even the manufacturers might profit a little by this example.

Testing a Tire Valve

In Fig. 2 is shown a very simple method of testing a tire valve for leakage. One has but to bring the wheel to rest so that the tire valve is at the top, then after having inflated the tire, and secured the valve cap in place, hold a glass of water as indicated so that the valve stem projects down into the water. If there is any leakage of air therefrom, it will be plainly indicated by the bubbles that will arise from the point of leakage.

Keeping Caps on Grease Cups

Lost caps from grease cups are a frequent source of annoyance and sometimes result in damage to the parts intended to be lubricated by the grease that has disappeared on account of the lost cap. Of course, usually the trouble goes no further than the necessity for a new cap. It is a great deal better, however, and not much more expensive—in fact, cheaper in the long run—to employ a set of really good cups with locked caps. A great cup cap may go on quite stiffly and seem secure, but it is amazing what vibration will do in the way of shaking off things that appear to be immune from such trouble.

The Mathematics of Motoring

DISSATISFACTION among motorists, particularly among those identified with the trade, with the standard method of rating the power of gasoline engines long has been a subject of frequent comment. With the advent of the long-stroke motor this dissatisfaction has become acute in some instances. The standard method of rating motors is by the S. A. E. formula, originally known as the A. L. A. M. formula. It is usually stated

$$HP = \frac{D^2N}{2.5}$$

at 1,000 feet per minute piston speed, where the D is the bore of the cylinder in inches and N is the number of cylinders in the motor.

It is obvious that all motors of the same number of cylinders and the same diameter of cylinder bore will be rated the same, no matter what their length of stroke or speed of revolution—two factors which materially affect the horsepower delivered. It is generally conceded that the formula gives nearly correct results for the average motor whose stroke is equal to the bore and at the assumed piston speed of 1,000 feet per minute.

The standard horsepower formula is mathematically correct so far as its derivation is concerned and by using it as applying to square motors at a piston speed of 1,000 feet per minute, a formula may be derived which will take the four factors of bore, stroke, number of cylinders and crankshaft speed directly into consideration and give results which within limits are as accurate for the different strokes and crankshaft speeds as the older formula gives for a square motor at the assumed piston speed. These limits depend on the normal speed of the motors.

This formula is

$$H.P. = \frac{D^2N\,S\,R}{15{,}000}$$

where D is the cylinder bore in inches, S is the stroke in inches, R is the number of revolutions per minute and N is the number of cylinders.

In developing this formula from the S. A. E. formula, it was assumed that the power developed by the motor varied directly as the piston speed. This is a fair assumption, as it is admitted generally that it is nearly true for the average motor. But it is only true within limits, for all motors have a certain critical piston speed and crankshaft speed at which further increase in speed results in a decrease instead of an increase in power. Below this speed, however, the formula will be found to give results which approximate quite closely to the power developed by the average motor.

The chart herewith will enable the power of a motor of any bore and stroke and speed to be seen quickly.

New Horsepower Rating

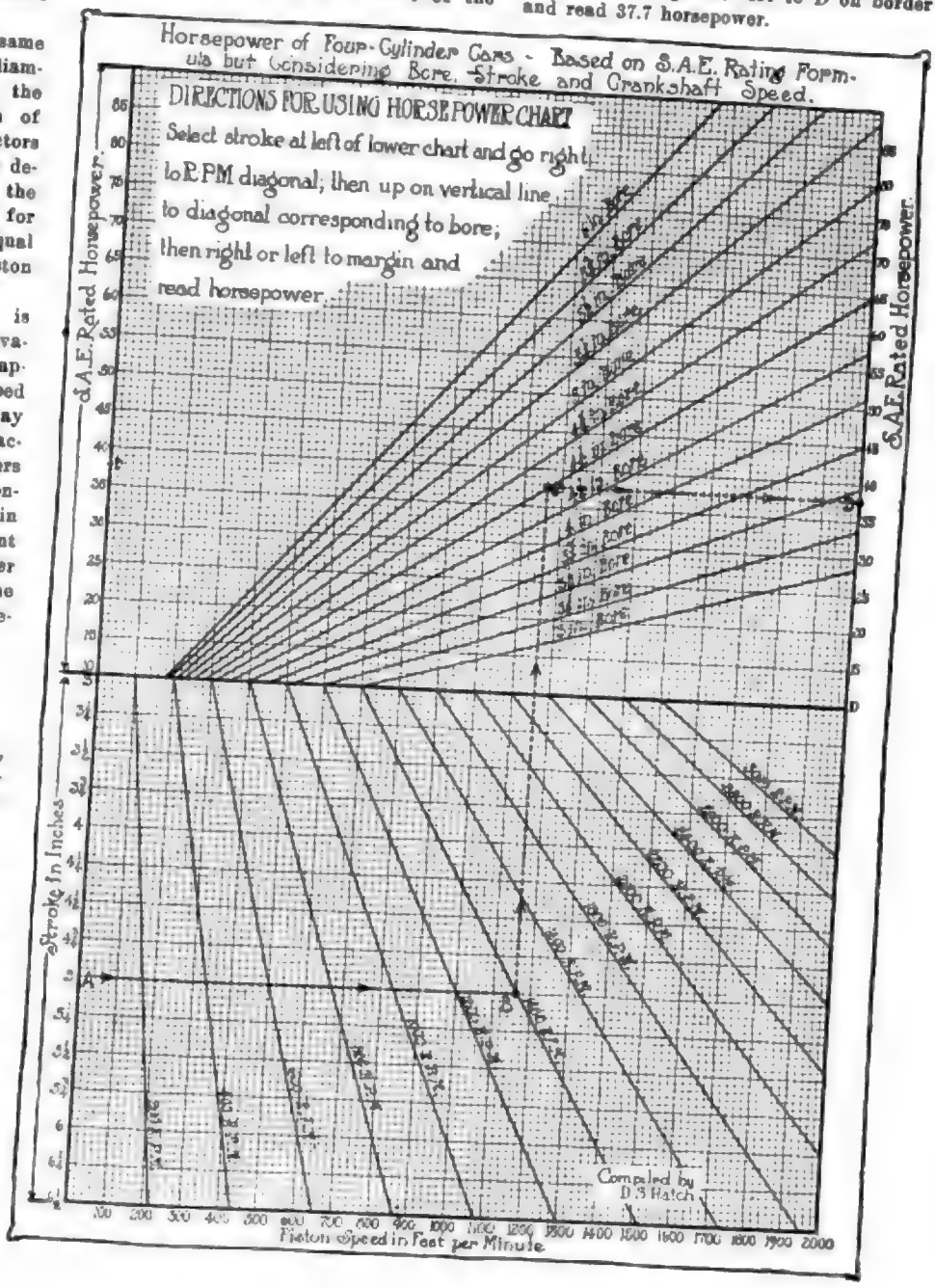
Modified S. A. E. Formula:

$$H.P. = \frac{D^2N\,S\,R}{15{,}000}$$

Where
D = Bore in inches
S = Stroke in inches
R = Crankshaft revolutions per minute.
N = Number of cylinders

To Use Power Chart

Enter chart at left of lower half at point corresponding to the stroke of the motor and run right to diagonal representing the crankshaft speed in revolutions per minutes; then up to diagonal in upper chart representing the bore of the motor; then right or left from that point to the border and read horsepower. Example: To find horsepower of motor with 4½-inch bore and 5-inch stroke at 1,400 revolutions per minute. From point A in lower chart representing stroke of 5 inches, run right to B on diagonal representing 1,400 revolutions per minute, then vertically upward into C in upper chart on diagonal corresponding to the bore of 4½ inches; then right or left to D on border and read 37.7 horsepower.



used on the smallest car, while 36 by 4-inch are used all around on the larger four, except when it is fitted with seven-passenger touring car and limousine bodies, when it takes 4½-inch tires instead. All tires on the sixes are 36 by 4½ inches.

Many improvements and changes have been made in the body designs, 14 types being offered. The lines have been made more sweeping in appearance, and easy riding has been the object. Doors are wide for easy access, and upholstery is specially heavy. A 2 inch pitch is given to all seats. Leather is blue-black, dull finished, pebble-grained and stuffed with hair. A depth of 11 inches is given to the cushions.

Chalmers Dash Equipment

The dash arrangement has been made especially attractive and is uniform for all models. The dash is leather-covered over the metal, no wood being used. A view of the dash arrangements is afforded in one of the accompanying illustrations. Speedometer, air-pressure gauge, self-starter handle, lighting switch and magneto switch are placed where they are most easily reached. The control levers have been placed within the body at the driver's right and no changes have been made in the driving arrangements.

Lighting is accomplished through the use of the Gray & Davis system. An automatic cut-out in connection with the light switch regulates the flow of current from the generator or storage battery, depending upon whether or not the motor is running. The Chalmers lighting equipment also includes combination oil and electric side and tail lamps, which is a valuable feature in an emergency.

On the larger cars the regular equipment includes, in addition to the features already mentioned, speedometer, tire irons, power tire-inflator, floor covers, robe and foot rails, horn, pump, jack, a full set of tools and a tire repair outfit. The small car has as regular equipment special Chalmers-type gas headlights.

Perhaps one of the most interesting features of the Chalmers announcement to motor car owners is the fact that the six will be marketed at a price of $950 lower than this year. This change in the cost of the company's highest-powered model is explained by the fact that during the past season the factory has been materially enlarged so that greater production is possible. The standardization of the entire Chalmers line, making many parts of the six-cylinder car interchangeable with those of the 36, has also had much to do with the fixing of the lower figure.

Wheelbases remain the same on the six-cylinder car and on the smaller four, these being 130 inches and 115 inches respectively. Formerly the model 17, four-cylinder type, had the same wheelbase as the 30, but for 1913 it has been lengthened to 118 inches.

Current Motor Patents

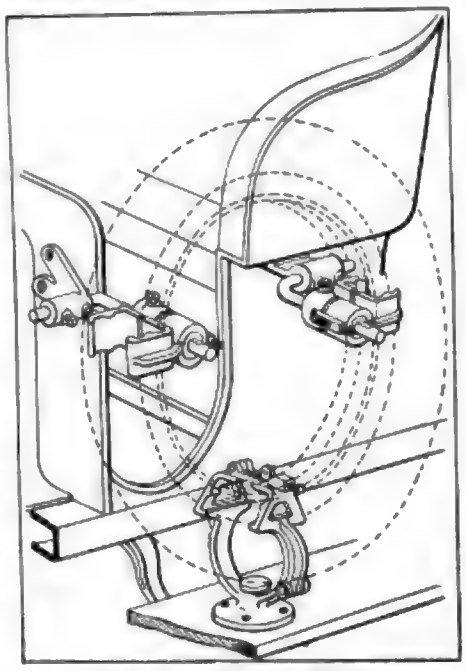


FIG. 1—FISK TIRE HOLDER

PATENTS ISSUED JULY 16, 1912.

1,032,404—Electrical Accumulator. Frederick Wyer Hardy and Emil Henry Hungerbuhler, Saltburn, England. Filed September 20, 1911. Serial No. 609,566.

1,032,435—Vehicle Wheel. John Sinnott, Philadelphia, Pa. Filed November 5, 1910. Serial No. 590,789.

1,032,453—Vehicle Jack. Frederic William Unger, Leesport, Pa., assignor, by mesne assignments, to Ellen D. Unger, Leesport, Pa. Filed October 18, 1910. Serial No. 587,686.

1,032,454—Shock Absorber. Richard T. Wainwright, Rye, N. Y. Filed August 21, 1911. Serial No. 645,196.

1,032,487—Force Feed Lubricator. Adolph W. Manzel, Buffalo, N. Y., assignor to Manzel Brothers Co., Buffalo, N. Y. Filed April 29, 1908. Serial No. 429,910.

1,032,502—Lubricator. Alexis R. Pribil, Detroit, Mich., assignor to Penberthy Injector Co., Detroit, Mich., a corporation of Michigan. Filed May 15, 1911. Serial No. 627,207.

1,032,516—Engine Starter. William L. Stuller, Detroit, Mich., assignor of one-quarter to George W. Soules, one-sixth to Thomas R. Bell and one-sixth to William H. Soules, Detroit, Mich. Filed February 28, 1912.

1,032,517—Axle Drive. Viggo V. Torbenson, Bloomfield, N. J., assignor, by mesne assignments, to Torbenson Gear & Axle Co., Bloomfield, N. J., a corporation of New Jersey. Filed November 28, 1911. Serial No. 662,900.

1,032,521—Float Valve. Friedrich Georg Wangelin, Dresden, Germany. Filed November 27, 1909. Serial No. 530,114.

1,032,536—Apparatus for Purifying the Exhaust of Internal Combustion Engines. Paul Gerli and Guido Blenio, New York, N. Y. Filed July 28, 1911. Serial No. 641,114.

1,032,544—Vehicle Tire. Le Roy R. Hess, Joliet, Ill., and Adelbert S. Burdick, Lockport, Ill., assignors to Samuel J. Drew, Joliet, Ill. Filed October 5, 1910. Serial No. ———.

1,032,547—Carburetor. Albert Howarth, Providence, R. I., assignor, by mesne assignments, to Star Carbureter & Supply Co., Providence, R. I., a corporation of Rhode Island. Filed July 24, 1909. Serial No. 509,380.

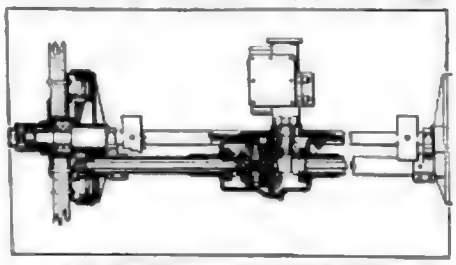


FIG. 2—TORBENSON REAR AXLE

1,032,570—Lubricator. Marion Taylor, Soudan, Va. Filed October 12, 1911. Serial No. 654,426.

1,032,579—Vehicle Tire. Howard M. Ambler, Philadelphia, Pa. Filed February 27, 1911. Serial No. 610,981.

1,032,582—Means for Regulating the Temperature of Air Fed to Carbureters. Davis Barnard, Los Angeles, Cal. Filed November 8, 1910. Serial No. 591,307.

1,032,584—Engine Starter. Ernst A. Bostrom, Atlanta, Ga. Filed January 17, 1911. Serial No. 603,134.

1,032,607—Supporting Device for Motor Cars. Edwin M. Ingalls, Newburyport, Mass. Filed November 21, 1910. Serial No. 593,298.

1,032,620—Adjustable Wrist Pin Bearing. Ezra F. Morton, Long Pine, Neb. Filed December 29, 1911. Serial No. 668,548.

1,032,633—Motor Car. Charles B. Stebbins, Three Rivers, Mich., assignor to Sheffield Car Co., Three Rivers, Mich. Filed December 2, 1911. Serial No. 663,503.

1,032,659—Tire Holder. John Clarence Cole, Chicopee Falls, Mass., assignor to the Fisk Rubber Co., Chicopee Falls, Mass., a corporation of Delaware. Filed May 25, 1910. Serial No. 563,248.

1,032,662—Sight Feed Condensation Displacement Lubricator. Frank W. Edwards, Logansport, Ind., assignor to the Chicago Lubricator Co., Chicago, Ill., a corporation of Illinois. Filed August 24, 1908. Serial No. 450,096.

1,032,681—Vehicle Spring. Lyman D. Jones, Bridgeport, Conn., assignor to Etta E. Brandeau, Bridgeport, Conn. Filed February 1, 1912. Serial No. 674,767.

1,032,690—Motor Car Buffer. Allan L. McGregor, Chicago, Ill. Filed November 13, 1911. Serial No. 659,931.

1,032,694—Engine-Starting Device. Charles A. Milne, William Taylor and Myron R. Churchill, Detroit, Mich., assignors, by mesne assignments, to Motor Appliances Co., Detroit, Mich., a corporation of Michigan. Filed May 13, 1909. Serial No. 495,643.

1,032,696—Friction Clutch. Peter J. Mueller, Maquoketa, Iowa. Filed August 31, 1911. Serial No. 647,019.

1,032,724—Lubricating Device. Conrad B. Adams, Buffalo, N. Y., assignor to the Pierce-Arrow Motor Car Co., Buffalo, N. Y. Filed April 22, 1912. Serial No. 692,373.

1,032,730—Elastic Wheel. Henry G. Baldwin, San Francisco, Cal. Filed July 11, 1911. Serial No. 637,904.

1,032,737—Dual Tire Wheel for Motor Trucks. Phineas Jones, Metuchen, N. J. Filed January 6, 1912. Serial No. 669,753.

1,032,759—Clutch Mechanism. Louis A. Maurer, Newark, N. J. Filed December 15, 1911. Serial No. 665,987.

1,032,794—Exhaust Silencer for Internal Combustion Engines. Franz Emil Wolf, Nowawes, near Potsdam, Germany. Filed May 13, 1910. Serial No. 561,053.

1,032,863—Wind-Shield for Motor Cars. Willis A. Pearson, Troy, Ohio. Filed April 16, 1910. Serial No. 555,937.

1,032,863—Vehicle Wheel. Vincent Sanphy, South Bend, Wash. Filed January 31, 1912. Serial No. 674,430.

1,032,877—Vehicle Wheel. James W. Caita, Platte, S. D. Filed December 29, 1911. Serial No. 668,415.

1,032,903—Motor Car Driving Gear. John Hettrich, Lincoln, Neb. Filed September 28, 1910. Serial No. 584,316.

1,032,934—Controlling Mechanism for Motor Vehicles. Bennett J. Patrick, Brookfield, Mo. Filed November 16, 1911. Serial No. 660,673.

1,032,937—Carbureter-Heater. Burt Neulon Pierce, Indianapolis, Ind. Filed January 27, 1910. Serial No. 540,323.

1,032,942—Spring Wheel. Bert E. Riley, La Harpe, Ill. Filed May 13, 1911. Serial No. 626,928.

1,032,953—Retainer for Ball Bearings. Richard A. Schultz, Chicago, Ill. Filed August 18, 1911. Serial No. 644,823.

1,032,955—Puncture Proof Inner Casing for Pneumatic Tires. Thomas F. Shields and Willis Ray Bolter, Lowell, Mich. Filed November 9, 1911. Serial No. 659,352.

1,032,957—Vehicle Wheel. Robert Thomas Smith, Jr., Longford Bridge, Warrington, England, assignor of one-half to Lynton Wheel and Tire Syndicate, Limited, Longford Bridge, Warrington, England. Filed January 29, 1910. Serial No. 540,827.

1,032,977—Cushion Tire. David A. York, North Grove, Ind., assignor of one-half to William H. York, Ashley, Ind. Filed October 5, 1911. Serial No. 652,907.

1,032,978—Governor for Explosive Engines.

Latest Ideas of Inventors

Frederick C. Zumdahl, Rockford, Ill., assignor to Rockford Engine Works, Rockford, Ill., a corporation of Illinois. Filed September 24, 1910. Serial No. 583,645.

1,032,979—Gasoline Engine. Frederick C. Zumdahl, Rockford, Ill., assignor to Rockford Engine Works, Rockford, Ill., a corporation of Illinois. Filed January 3, 1911. Serial No. 600,585.

1,032,983—Rotary Gas Engine. Emile Berliner, Washington, D. C., assignor to Gyro Motor Co., Washington, D. C., a corporation of the District of Columbia. Filed September 21, 1911. Serial No. 650,627.

1,032,990—Spring protector and Shock Absorber. Robert P. Clark and William H. Clark, Fresno, Cal. Filed December 23, 1911. Serial No. 667,456.

1,032,991—Tire. Clinton T. Coates, St. Louis, Mo. Filed March 18, 1911. Serial No. 615,360.

1,032,997—Removable Motor Car Top. Raymond W. Eastman, Alva, Okla. Filed August 15, 1911. Serial No. 644,148.

1,033,004—Engine Starter for Motor Cars. William S. Grigsby, Denver, Colo. Filed June 19, 1911. Serial No. 634,148.

1,033,038—Apparatus for Oiling Roads. George M. Sayholt, Jersey City, N. J., assignor to Standard Oil Co., New York, N. Y., a corporation of New Jersey. Filed October 12, 1909. Serial No. 522,265.

1,033,048—Fluid Clutch. John C. Carpenter, Houston Heights, Tex. Filed November 14, 1910. Serial No. 592,164.

1,033,056—Locking Shutter for Taximeters. Paul Richert, Pittsburgh, Pa. Filed December 5, 1910. Serial No. 595,764.

1,033,070—Headlight. John Eugene Koeberle, Los Angeles, Cal. Filed July 23, 1908. Serial No. 445,430. Renewed March 19, 1912. Serial No. 684,810.

13,444—Automatic Clutch. Oliver C. Talbot, Kansas City, Mo. Filed May 31, 1912. Serial No. 700,889. Original No. 965,606, dated July 26, 1910. Serial No. 524,297.

PENBERTHY Lubricator—No. 1,032,502—Alexis R. Pribil, Detroit, Mich., assignor to the Penberthy Injector Co., Detroit, Mich. Filed May 15, 1911, dated July 16, 1912. A sight-feed lubricator, designed expressly for internal combustion motors. It consists of the usual cylindrical oil reservoir, with glass sides, having within its center an axial standpipe in which a needle valve is situated, seating in the bottom outlet of the stand-pipe, which communicates with the bottom of the reservoir, and being controlled by an eccentric lever mounted on the top of the device, under the tension of a coil spring. An air duct leads to the top of the reservoir from the expansion chamber to which the needle valve communicates. This expansion chamber leading to a small double-seated ball check valve, which opens into the final outlet. This portion of the device is threaded to the body, so that it can be removed.

Pierce-Arrow Worm Gear Lubricator—No. 1,032,724—Conrad R. Adams, Buffalo, N. Y., assignor to the Pierce-Arrow Motor Car Co., Buffalo, N. Y. Filed April 22, 1912, dated July 16, 1912. For the purpose of lubricating the thrust and radial bearings at the end of the worm element of a worm-gear axle assembly, this device consists of an oil propeller near the end of the worm-shaft adjacent to these bearings, in the form of helical blades, so pitched as to move the oil raised by the worm-gear, toward the bearings.

Axle Drive—No. 1,032,517—Viggo V. Torbenson, Bloomfield, N. J., assignor by mesne assignments to Torbensen Gear and Axle Co., Bloomfield, N. J., filed Nov. 28, 1911, dated July 16, 1912. Consisting of an externally geared drive axle, this device is mounted on a motor vehicle in the usual manner. The main axle is of the I-beam type, adapted to receive the housing of the driving member. This latter portion of the device consists of a divided driving shaft, connected at its middle by a differential gear, and driving the wheels by means of pinions secured to the ends of low the edge of the mixing chamber, above its members, engaging with gears within the brake drums. The differential is driven by bevel gears and a transverse shaft in the usual manner.

Howarth Carbureter—No. 1,032,547—Albert Howarth, Providence, R. I., assignor by mesne assignments to Star Carbureter and Supply Co., Providence, R. I. Filed July 24, 1909, dated July 16, 1912. The feature of this design consists of a piston valve, raised by the suction of the engine, which on rising opens auxiliary air inlets or tuyeres and unseats a needle it. A plunger, actuated by an angle lever is used to raise it for starting. The needle valve seat is adjustable from below.

Tire Holder—No. 1,032,659—John Clarence Cole, Chicopee Falls, Mass., assignor to the Fisk Rubber Co., Chicopee Falls, Mass. Filed, May 25, 1910, dated July 16, 1912. The improvement embodied in this device consists of its means of retaining the tire, consisting of three metal clamps, two to be secured to the body, and one to the running board. These clamps grip the tire on its inner bead instead of on the outside. The bottom clamp has a hinged jaw adapted to lock in engagement with the body of the clamp, and to simultaneously tighten its grip on the tire.

German Exhaust Silencer—1,032,794—Franz Emil Wolf, Nowawes, Germany. Filed May 13, 1910. Dated July 16, 1912. Of unusually compact and simple nature, this invention, of efficient, should prove a real improvement over the ordinary cylindrical muffler. It consists of a number of thin metal plates, clamped transversely to the exhaust pipe, with holes through the centers of all but the last, which blocks the fine interstices between the disks, exhausting it at their edges. The last plate could be fitted with a valve at its center to act as a cut-out.

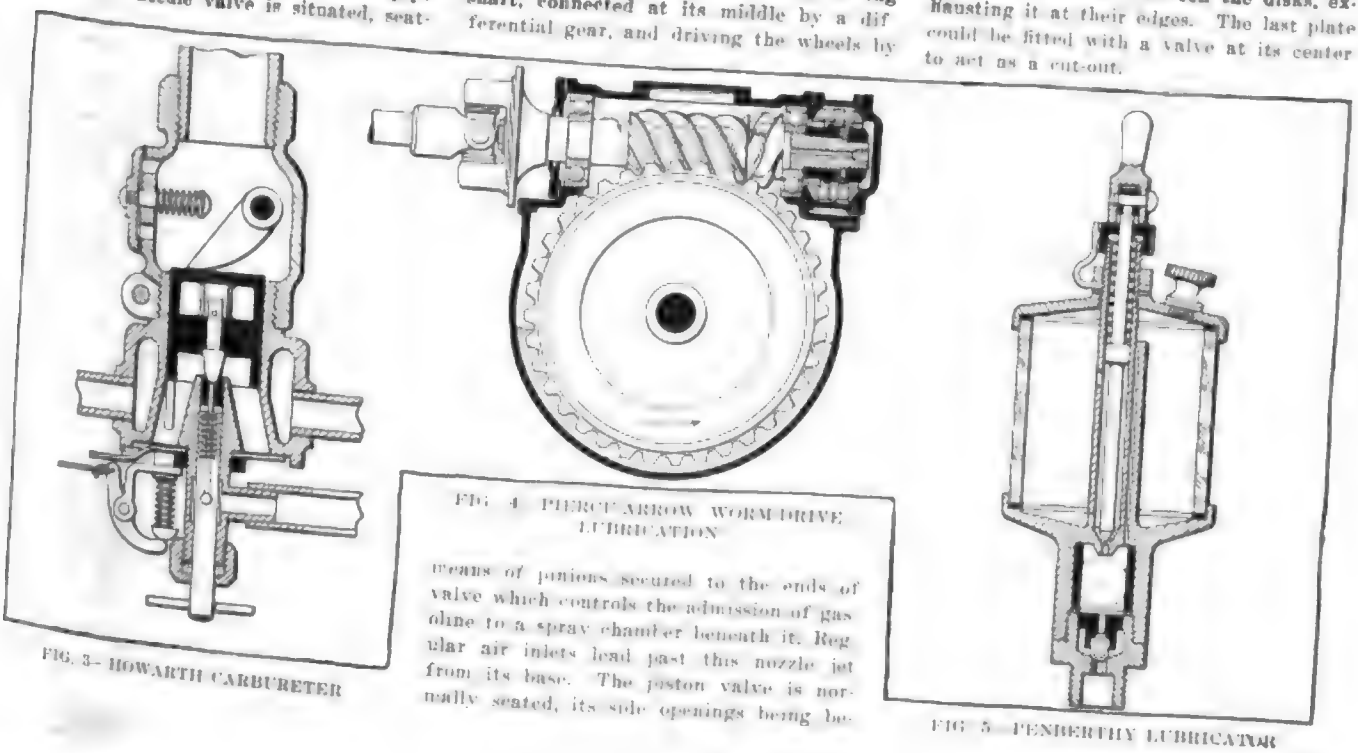


FIG. 3—HOWARTH CARBURETER

FIG. 4—PIERCE-ARROW WORM-DRIVE LUBRICATION

valve which controls the admission of gasoline to a spray chamber beneath it. Regular air inlets lead past this nozzle jet from its base. The piston valve is normally seated, its side openings being be-

FIG. 5—PENBERTHY LUBRICATOR

The Realm of The Commercial Car

ealth and Quiet Another Argument

Motor Truck More Sanitary than Horse and Makes Less Noise

y William B. Stout

HI the adoption of motor vehicles ne number of horses in London has l from 500,000 to 70,000. Will the truck eventually supplant the horse erica?

greatest growth of man or people is along lines of efficiency. Useless nust be eliminated, all energy con- ed and directed along the lines of esistance to accomplish the greatest with the least expenditure of time ergy. With the coming of a higher f efficiency per man as a basis, old ls will have to be eliminated to give to the new, and more advanced of living adopted. Every hindrance tal efficiency and activity will be way with in the eventual order of and with the advent of the gospel iency as a basis of life will come eased opportunity.

world never has moved backward. rention with possibilities in it for work cheaper, quicker and with fort ever has been dropped until ing better has come to take its and every new invention of worth reased the worth of a life by its alue. There can be no doubt but late inventions, or rather develop- there has come no one more im- than the improvement and adop- the motor truck as a delivery unit. otor vehicle is here. For city work t the horse is doomed.

anitation Angle

matter of sanitation alone was suf- to condemn him as soon as the truck appeared, but the public, used hy streets and dusty winds, has t of the health aspect last. Streets future need have no animal filth d with what dust collects, and an ic of colds and grippe, costly in g effort and lives every season, need low every dust storm or windy day. or of gasoline is at least clean, and oil will lay dust, not poison it. otor truck is the greatest existant ctor to the swat-the-fly movement ith its coming also will be seen to ear a large measure of contagious s now traceable to the domestic he house-fly. Flies do not breed in s. Common humanity, sanitation ommon sense demands the elimina- the horse and urban life.

reat hindrance to office efficiency in ted districts is noise. Much was the noise of the motor car in its tages of development and legislation was passed demanding quietness, yet the common two-horse coal wagon going home empty at 3 miles an hour over the cobble pavement made more racket than motor cars. The public was used to wagon noises—the motor car noise was new and it demanded its suppression.

Not long since the writer, while waiting for a car, overheard the remarks of some bystanders as to the noisiness of a 5-ton motor truck which passed at full speed, with loose chains and worn sprockets. The noise of the motor truck was drowned before it was half a block away by the noise of an approaching street car four blocks away on a sanded track, but the talk still continued about the truck. The speakers were used to the noise of a car line and did not notice it. Trucks are being made quiet. Eventually the street car line must be made quiet or it will be forbidden the streets.

Abroad, and in London particularly, there already is a standard of quietness to which all motor vehicles must conform. As the motor vehicle has come to be the unit of transportation on London streets so has quietness increased, and the city's roar diminished.

Noise Made by Horses

There are zones of quietness enforced about hospitals in these days within which street cries are prohibited, mufflers must be left closed and all unnecessary disturbances eliminated. If noise is a strain on the mind of a person weakened by sickness then it must be a strain to a healthy person, not noticed on account of self-control, but nevertheless present. By eliminating noise mental efficiency is increased. As business comes to demand quietness and freedom from abstraction, it will demand the elimination of the iron-tired vehicle and clacking iron-shod animals, and the substitution of a quiet motor truck. Both bodily and mental forces demand the elimination of the horse from the standpoints of sanitation and mental efficiency. Motor vehicles can and will meet the new order of things.

One great problem of our fast growing cities is how to take care of traffic in congested areas. Chicago for instance is adding to its population at the rate of more than 60,000 people a year. These must be served by firms which grow to meet the demand and these in turn handle their business through the loop or central business area where traffic is now enormous. Eighty thousand tons of freight are hauled through this area of less than a square mile every day. The rate of movement is between 2 and 3 miles an hour. Stops at crossings are frequent to allow other traffic to pass. These stops

IT'S SERVICE THAT COUNTS

WHILE prospective motor truck buyers are laying emphasis on costs of operation in connection with their delivery work, many are buying pleasure cars for their agents without expectation of cutting down carfare through so doing but of acquiring increased business.

With a firm operating locally over a considerable territory, or covering rural districts, there is a great deal of time lost by the drummer or salesman in waiting for trains or, in the case of city work, in riding over roundabout car routes to visit customers in inaccessible places. These men must be visited, and the motor car in this case becomes a motor delivery vehicle whose load is the ability of the salesman. The dealer buys a car for this man because with it the cost per delivery of his sales arguments is cut down, for the salesman often can see twice as many customers in a day as though he were using the train or street car.

This being the case, the car takes the place of an extra salesman and hence is a saving, for to run a car is cheaper than to hire a good salesman, while good cars are many and salesmen of class few. It is not that the firm has saved carfare or railway expenses through the adoption of motors, but that it has increased efficiency with the same equipment of men, and cover a greater territory. There are possibilities for business growth not before present.

The same is true with the buying of a motor truck. It is not that there will be a saving at first in cost of delivery per package—though there may well be—but that a new field is opened for increased business and a new field of operation with almost the same equipment of employes, and little addition to office duties. It is service that counts.

Brief Business Announcements

Recent Agencies Appointed by Car and Truck Manufacturers

PLEASURE CARS

Town	Agent	Make
Alexis, Ill.	W. A. McKnight	Henderson
Atlanta, Ga.	Atlanta Auto Sales Co.	Henderson
Boston, Mass.	A. P. Underhill	Grinnell
Bristol, Vt.	W. A. Lawrence	Ford
Bloomer, Wis.	W. A. Struve	R. C. H.
Bridgeton, N. J.	W. Middleton Sheppard	R. C. H.
Boston, Mass.	James A. Binney	Henderson
Cincinnati, O.	Peerless Motor Sales Co.	Peerless
Chicago	Charles E. Hammerly	R. C. H.
Columbus, O.	Gwinn Sales Co.	Lozier
Davenport, Ia.	Newman Machine Co.	Auburn
Durant, Ia.	Hanson Auto Co.	R. C. H.
Grundy Centre, Ia.	A. C. Schafer	Henderson
Guilford, Conn.	S. B. Hull & Co.	Ford
Hartford, Conn.	H. W. Yeager	Velie
Kingston, N. Y.	Ulster Garage	R. C. H.
Kansas City, Mo.	H. F. Sundin	National
Kent, O.	J. A. Ewing and A. R. Atkins	R. C. H.
Little Rock, Ark.	G. L. Omahundro	Marmon
Los Angeles, Cal.	J. W. Willcox	Henderson
Newark, N. J.	Service Motor Sales Co.	Henderson
Northampton, Mass.	T. J. Collins	R. C. H.
Nashua, N. H.	City Garage Co.	Haynes
Niagara Falls, N. Y.	Niagara Falls Auto Transit Co.	R. C. H.
Missoula, Mont.	J. J. Deakin	Henderson
Mattoon, Ill.	Mattoon Refrigerating Co.	Henderson
Mt. Sterling, O.	H. Clay McKee	Regal
Osborne, Kan.	F. M. Cole	R. C. H.
Philadelphia, Pa.	Johnson Motor Car Co.	Henderson
Puerto Rico	G. A. Besosa	Marmon
Revere, Mass.	Walter T. White	Ford
San Benito, Tex.	Whittlesey Garage & Machine Co.	Henderson
San Francisco, Cal.	Bonnheim-Moore Motor Car Co.	Henderson
St. Louis, Mo.	Model Automobile and Sales Co.	Henderson
St. Louis, Mo.	Weber Imp. Co.	R. C. H.
Strasburg, Ill.	John Bauer, Jr.	R. C. H.
Shamokin, Pa.	George W. Turner	R. C. H.
Springfield, Mass.	Forest City Garage	Henderson
San Antonio, Tex.	Lawton Motors Co.	R. C. H.
Wareham, Mass.	B. Burleigh Sisson	Ford
Windsor, Ont., Can.	F. S. Evans	King
Waterloo, Ia.	Blackhawk Auto Co.	Henderson
Washington, D. C.	Matheson Motor Co.	Henderson
York, Pa.	York Rubber Tire Co.	Cutting
York, Pa.	Auto and Truck Sales Co.	Hudson

TRUCKS

Town	Agent	Car
Canton, O.	N. J. Cummins	Modern
Columbus, O.	M. P. Murnan	Alco
Covington, O.	Crampton and Ulery	Modern
Hartford, Conn.	Edred W. Clark	Modern
Pittsburgh, Pa.	West Penn Automobile Co.	Modern
Poughkeepsie, N. Y.	Cleveland Garage Co.	Modern
Providence, R. I.	Motor Service Co.	Veerac
Providence, R. I.	Harris Brothers Auto Co.	Piggins
Springfield, Mass.	Morse-Readio Auto Co.	Modern
Topeka, Kan.	J-A-R Motor Co.	Lincoln
Washington, Pa.	Mansfield Auto Co.	Modern

BRANFORD, Conn.—A. J. McCutcheon has just opened a new garage here.

Chilton, Wis.—Robert Hippe is organizing a garage company and work already has been started on a $12,500 building.

Toronto, Can.—The Automobile and Supply Co. has secured the distributing agency in the province of Ontario for the Chalmers.

Spokane, Wash.—A. H. Brown, manager of the Spokane branch of the Studebaker Corporation, has been appointed to fill the vacancy created by Mr. Rose's retirement.

Toronto, Can.—The Matheson Automobile Co. has been appointed Canadian sales agent for the Norwalk. This company also is Canadian distributor for the Matheson.

Bristol, Conn.—The Barker Automobile Co., of Bristol, has given out the contracts for its new garage on Riverside avenue, which is to be a brick structure, one story high, with dimensions 100 by 60 feet.

Cincinnati, O.—The Heilman Motor Car Co., Blue Rock and Hamilton avenues, general agent for the Regal cars, has placed a subagency for the Regal with H. Clay McKee & Sons, at Mount Sterling, Ohio.

Toledo, O.—A new company is being organized at Toledo for the purpose of handling motor cars in northern Ohio. The concern, which will be incorporated within a few days, is headed by Charles P. Landman, formerly of the Blevins Auto Sales Co. It will open sales rooms on Madison avenue about September 1. A deal has already been closed for the Flanders electric agency.

Detroit, Mich.—A. J. Carrier has been appointed southern wholesale representative for the Hupp-Yeats electric.

San Diego, Cal.—J. A. McCaddon, representative for the Cadillac Hupp-Yates machines, is constructing a new home to cost $15,000.

Hampton Beach, N. H.—F. L. Beistol, of Portsmouth, N. H., has just opened a large garage at this place, which is one of the big summer resorts of New Hampshire.

Tacoma, Wash.—The Olympic Motor Co., distributor of Olds cars in southwestern Washington, will move to its new home, 739-41 South C street, Tacoma, during the coming week.

San Francisco, Cal.—The Haynes Automobile Co. has purchased control of the Haynes Auto Sales Co., of San Francisco, and announces the appointment of W. B. Cochran as direct factory representative.

Fond du Lac, Wis.—Grant Thomas, president of the Sales and Supply Co., Fond du Lac, is preparing to engage in the manufacture of the Success oil can and container invented by T. W. Alexander, of Burlington, Ia.

Janesville, Wis.—George Decker, president and general manager of the Janesville Motor Car Co., has started work on a combination hotel and garage building, the first of this kind in Wisconsin. The first floor frontage will be divided into hotel lobby and garage offices, the garage entrances being at side and rear. The hotel will have fifty rooms and the storage capacity of the garage will be 100 cars.

Bridgeport, Mass.—C. Barnum Seeley is building a garage 52 by 104 feet on State street.

Los Angeles—Bert Dingley last week took his place on motor car row as manager of the local branch of National Motor Vehicle Co.

St. Louis, Mo.—The Cochrane Motor Sales Co. has taken the agency for the Garford truck in addition to that of the Gramm. This firm also has the Modern delivery wagon line.

Montreal, Can.—The DeVaux Motor Co. has opened a large show room adjoining its old garage at Lafontaine Park and Garnier street. It is agent for Nyberg, Detroit and Waverley.

Boston, Mass.—The Stutz Motor Car Co. moved last week into its new salesrooms, 895 Boylston street, formerly occupied by the White, Ware & Leatherbee Co., agent for the Bergdoll.

Boston, Mass.—The Essenkay Co., Chicago, has leased the quarters in the motor mart, Boston, formerly used by the Alvan T. Fuller Co., agent for the Packard, and will be ready to do business in a few days.

Milwaukee, Wis.—M. J. Monson has been appointed general manager of the Wisconsin and upper peninsular branch of the Buick Motor Co., with headquarters at the district branch house, 162 Wisconsin street, Milwaukee. Mr. Monson succeeds Lawrence A. Brown, who died 2 months ago. He formerly managed the

Electric Vehicle Garage Co., 521 Grand avenue, Milwaukee.

Boston, Mass.—A. P. Underhill, who handles the Knox line in eastern Massachusetts, with headquarters in Boston, has taken on the Grinnell electric.

Minneapolis, Minn.—The Schacht Motor Co., of Cincinnati, will put an agency at St. Paul or Minneapolis. Louis A. Howard is in the Twin Cities from the factory looking for an opening.

Saskatoon, Can.—The Metropolitan is a new garage which has just been opened on Second avenue and Twenty-fifth street. C. L. Ackerson is in charge. He was formerly connected with the United Motor Co. in the United States.

Columbus, O.—The Broad-Oak Automobile Co., which was recently sold out to a new set of owners, has been reorganized by the election of W. J. Miller, president; Robert R. Turner, vice-president, and R. M. Weaver, secretary-treasurer.

San Antonio, Tex.—The Ford Sales Co. has been organized here with a capital stock of $5,000. Its purpose is to sell motor supplies and operate a repair shop. The incorporators are M. D. George, Clifton George and George H. King.

New Glasgow, N. S.—The Stevens Motor Co., Limited, a recently incorporated company of New Glasgow, N. S., has the agency for the Cutting for the maritime provinces. I. E. Stevens, the sales manager of the concern, was formerly with the Ramsey Motor Co., of Montreal.

St. Paul, Minn.—The Service Auto Co. has rented the garage formerly occupied by the White Bear Co., and will do a general garage and repair business. The owners are four young men, B. F. Kartak, Denn LaRoche, LeRoy Emsley and Joseph Tighe.

Minneapolis, Minn.—George B. Levy, formerly of Chicago, who has handled the Hudson in the northwest, including Minneapolis, has given up the agency, Hebberly & Smith, of St. Paul, being his successors. Mr. Levy as yet has no future plans.

Montreal, Can.—Chadburn & Hunt have been appointed sole agents for the province of Quebec for the Brockville Atlas car. While the location and fitting up of a suitable show room is going on, the present offices will be used as temporary quarters.

San Francisco, Cal.—H. W. Evans, who has been connected with the San Francisco branch of the Locomobile company for the last 2 years, has been put in charge of the truck business of that company for the Pacific coast.

Spokane, Wash.—Sales Manager Benson, of the Studebaker Corporation, announces the promotion of A. H. Brown, manager of the firm's Spokane branch, to be northwestern sales manager for the company. In his new capacity Mr. Brown will have charge of the distribution of more than $2,000,000 worth of Studebaker motor cars, it is said.

San Diego, Cal.—The Tibbals-Gavin Co. has recently become the San Diego county selling agents for Havoline oils.

Toronto, Can.—Peter Union tires, which are widely used in Europe, are now handled in Canada by John N. Walford.

Watertown, Conn.—The F. H. Bronson building has been fitted up by Charles Sherwood for a public garage, the first one opened in the town.

Dallas, Tex.—M. A. Sacksteder, formerly manager, and C. H. Potter, formerly assistant manager for the United Motor Co. in Texas, have resigned their positions and will open a house for the sale of the Marion and the American cars.

New York—Appointment is announced of Fred A. Crooks as city sales manager for the New York Alco branch. Mr. Crooks has been identified with the industry for years. He was formerly associated with the Darracq Motor Co. and the Palmer-Singer Co.

Orillia, Can.—Harry Bill, formerly general manager of the Metzger Motor Car Co., of Detroit, has become general manager of the Tudhope Motor Car Co., of Orillia, which makes the Everitt car in Canada. He takes with him Joseph Gardham as factory manager.

Albany, N. Y.—E. Vincent Stratton has resigned as sales manager of the Packard agency at Albany to organize a sales service and supply station at that city for Everitt cars and Flanders electrics for eastern New York, western Vermont and western Massachusetts.

Calgary, Can.—Although the Ford Motor Agency, Limited, of Calgary, was established only in March, 1911, it already has outgrown its original quarters, and in order to take care of its rapidly increasing business has opened a large new garage at 129 Eleventh avenue east.

Lima, O.—The Lima branch of the Willys-Gramm Motor Truck Co., formerly of the Gramm plant, is to be enlarged in the near future. The plans for the addition and alterations have not yet been completed, but some definite announcement is expected within the next month.

Springfield, Mass.—M. E. A. Stoddard, one of the largest stockholders of the Stoddard Motor Car Co., has resigned as manager of the Springfield branch of T. G. Coombe & Co., member of the New York stock exchange, to give his entire time to the management of the motor agency.

Milford, Mass.—The International Trolley-Mobile Co., which was granted a franchise some months ago for a trolley line through the town, has not been heard from lately and the terms of the franchise has not been lived up to, so that it has expired. H. L. Milliken and Edwin L. Shavelle, of Boston, were behind the plan and an opportunity was offered the Milford people to purchase stock in the company. But little if any was sold in the town, so the promoters probably could not finance the deal.

Cincinnati, O.—The Peerless Motor Sales Co. is the style of a new concern formed here to distribute Peerless cars. Its location is at 2713-2717 Woodburn avenue.

Davenport, Ia.—August Leberman, formerly a partner in the Davenport Auto Co., has disposed of his interest in the business. The Davenport Auto Co. has lately become agent for the King.

Philadelphia, Pa.—The Philadelphia branch of the Mercer Automobile Co., 620-622 North Broad street, has been absorbed by the Whiting Motor Co., of New York, the local branch to have the agency for Pennsylvania, Delaware and Maryland.

Plymouth, Wis.—Torke Brothers are erecting a three-story building of fireproof construction, 50 by 120 feet in size, to be used for garage and machine shop purposes. It will cost $30,000 and will be one of the largest structures of its kind in Wisconsin outside of Milwaukee.

Ottawa, Can.—Another new firm is added to Ottawa's business circle, the Try Me Tire Co., at 266 Sparks street. This business was established through the enterprise of two Ottawans, F. B. Carling and Eric H. McLaughlin. The concern will handle United States tires.

Sheboygan, Wis.—Traugott Wilke has re-established his garage and machine shop in the Illig building. The former works are now occupied by the Sheboygan Machine Co., composed of former employes of the Falls Machine Co., of Sheboygan Falls, Wis.

Toledo, O.—A garage will be erected at the corner of Madison avenue and Eleventh street by Judge John H. Doyle and C. T. Lewis. The structure will be a two-story brick building and cost about $15,000. It will have a frontage of 50 feet on Eleventh street and 75 feet on Madison.

Cincinnati, O.—The Acme Motor Delivery Co. has been incorporated with a capital of $15,000 to operate a motor express business in this city and suburbs. The principals of the new company are W. E. Minor, F. L. Allen, S. P. Sutphin, Davis Wachmann and J. B. Minor.

Springfield, Mass.—One of the best garages in Springfield has just been completed for R. A. McKee on Worthington street, in the center of the motor district. It is two stories high, but the foundations are such that additional floors may be added from time to time.

Columbus, O.—Columbus is to have a new garage, to be located at the southwest corner of Third and Rich streets, in a large structure formerly used as stables for the Peruna company. H. A. Sells and J. R. Claney have taken a long-time lease on the property, and the work of remodeling into an up-to-date garage is being pushed rapidly. The concern will be known as the Capitol Garage and Storage

Co. It is expected to operate a taxicab business also.

Toronto, Can.—Bowveur & Son, of this city, is representing in this territory the Havers Motor Car Co.

San Francisco, Cal.—The R. C. H. Corporation, through its western sales manager, A. E. Morrison, has opened a branch and service station in San Francisco.

Rochester, N. Y.—Oswald V. Hughes has become superintendent of the gasoline pleasure vehicle department of the Empire State General Vehicle Co., Circle street. Mr. Hughes will also be sales manager of the Locomobile car, which local agency the Empire State concern recently secured.

Kansas City, Mo.—The Indiana Garage and Sales Co., located at 3316 East Fifteenth street, Kansas City, has closed a contract with the Lincoln Motor Car Works, of Chicago, whereby it becomes distributing agent for Kansas City and vicinity for the Lincoln light delivery wagons.

St. Paul, Minn.—The northwestern branch of the Republic Tire Co., St. Paul, F. W. Osmun, manager, has moved to a new building at 167-169 West Sixth street. The show room is 25 by 100 feet. It has a heated driveway for winter use. In the basement is 5,250 square feet of storage space.

San Francisco, Cal.—The Henderson car has entered the San Francisco field, the agency being taken by Edward Bonnheim and Harry Moore, under the title of the Bonnheim-Moore Motor Car Co. It will cover a large territory, including northern California, southern Oregon and Nevada.

Boston, Mass.—Work has started on the new building for the United States Tire Co., at the junction of Beacon street and Commonwealth avenue, Boston, and the foundation will be finished shortly. It is expected that the new structure will be ready for occupancy by January 1, when the branch on Boylston street will be vacated. The present building is being offered for sub-lease or for sale following that time.

Ottawa, Can.—The Ottawa-Maxwell Sales Co. has changed its firm name to International Motor Co.

Toronto, Can.—A garage costing $10,000 is being built by the Union Life Insurance Co. on Roncesvalles street.

Davenport, Ia.—Meinert & Rogers, 317-19 East Second street, will handle a taxi and repair business. E. C. Meinert and W. E. Rogers are the members of the firm.

St. Paul, Minn.—L. H. Rose, for 5 years manager of the northwest branches of the Studebaker Corporation, has resigned that position to become head of the northwest agency of the Metzger Motor Car Co.

Waukesha, Wis.—The Milwaukee Hardware Mfg. Co. has established a brass foundry in the buildings at St. Paul avenue and State street and will make a specialty of castings for motor cars, cycles and other machinery. The company is managed by L. A. Ashley and Charles H. Foss, of Milwaukee.

Zanesville, O.—Plans have been prepared for a large addition to the sales agency and garage of the Wedge company, at Sixth and Marietta streets. The addition is made necessary because of the large increase in the business of the concern. The addition will be of brick, 105 by 50 feet, and two stories high.

Minneapolis, Minn.—The F. E. Murphy Automobile Co., handling the Mitchell and the Flanders electric, has had plans drawn for a building 100 by 137 feet, at Thirteenth street and Hennepin avenue. It will be of brick and reinforced concrete, two or three stories, with foundations for six. The building will cost $60,000.

Boston, Mass.—The alterations by which two large salesrooms on Boylston street, next to the Massachusetts Automobile Club, are being made into one large room for the J. W. Maguire Co., agent for the Pierce-Arrow cars and trucks, are completed, and as a result the company now has the largest salesrooms on Boston's famous motor row, it is claimed. All the posts have been removed, making it one large room much like a big hall.

Dallas, Tex.—The R. C. H. Corporation has opened a branch with W. E. Talbot in charge.

Cincinnati, O.—The Progressive garage has opened at 3040 Reading road. Robert Bruns is the manager. The new company will handle the Pathfinder car exclusively.

Boston, Mass.—Joseph Gardham, well known in the middle west as a driver, has gone to Boston to take charge of the Boston service department of the J. S. Harrington Co., agent for the Everitt.

Buffalo, N. Y.—L. D. Smith has been appointed distributor for New York state of the O'Neil Tire Protector Co., which established this week its state office and service station at 1056 Main street.

Portland, Ore.—John E. Leslie has succeeded E. K. Allen as manager of the local branch of the Republic Tire Co. Mr. Allen goes to Seattle to take charge of the Washington and British Columbia business of the Republic.

Indianapolis, Ind.—The Henderson Motor Car Co. has removed its offices from the tenth floor of the Hume-Mansur building, Indianapolis, to its factory building at Fourteenth and North West streets, where the business of all departments, manufacturing, sales and executive, will be handled.

Boston, Mass.—Manager Charles Addison Malley of the New England branch of the Universal truck, has leased the building at 193 Pleasant street, formerly occupied by the Grabowsky truck company, as a service station and salesrooms for the Universal. H. L. Winters has joined him as sales manager.

Detroit, Mich.—W. W. Sears, of the Sears Automobile Co., Des Moines, Ia., this week closed a contract with the R. C. H. Corporation for selling rights in Iowa territory. During the coming season the R. C. H. Corporation will be represented in Nebraska, western Iowa and South Dakota by the Lininger Implement Co., of Omaha.

Recent Incorporations

Boston, Mass.—Plymouth Garage and Machine Shop Co., capital stock, $10,000; incorporators, A. J. Smith, R. E. Kingan.

Buffalo, N. Y.—Mason B. Hatch, capital stock, $20,000; incorporators, M. B. Hatch, O. W. Hatch, J. M. Chipman.

Cleveland, O.—Ideal Motor Car Co., capital stock, $200,000, to manufacture motor cars; incorporators, C. G. Amendt, J. C. Reichert, D. M. Postelwaite, F. J. Shaffer, E. Braguier.

Cleveland, O.—King Valveless Auto Whistle Co., capital stock, $25,000; to manufacture accessories; incorporators, D. Feffield, O. C. Snyder, G. H. Burrows, R. E. McMasters, C. J. Lowrie.

Camden, N. J.—Eldredge Co., capital stock, $75,000; to manufacture motor vehicles; incorporators, W. E. Eldredge, C. P. Sharpless, H. L. Adams.

Cincinnati, O.—Swing Wheel Automobile Co., capital, $15,000; to manufacture wheels; incorporators, A. J. Swing, Richard B. Warner, Rupert H. Langoale, C. A. Beckett and Richard A. Beckett.

Dayton, O.—Automatic Lamp Control Co., capital, $15,000; to manufacture lamp controls for motor cars; incorporators, Henry Ehlen, Ernest A. Eastman, William B. Meeker, Joseph Friedman and Mary E. Eastman.

Indianapolis, Ind.—Jenney Electric Starter Co., capital stock, $100,000; to manufacture starters; incorporators, C. D. Jenney, R. Wilson, W. L. Taylor.

Jackson, Mich.—Jackson Rim Co., capital stock, $100,000; to manufacture metal motor car rims; incorporators, O. W. Mott, W. Withington, M. Merriman.

Kansas City, Mo.—Palace Garage Co., capital stock, $5,000; incorporators, S. Sanders, G. Mass, I. Dick.

Memphis, Tenn.—Scott Motor Co., capital stock, $10,000; incorporators, J. C. Scott, W. H. Hayley, C. L. Sims, J. C. Sims.

New York—Fifty-second Street Auto Repair Co., capital stock, $2,000; incorporators, A. Williams, Jr., H. Matzinger, A. H. Darre.

New York—Resident Punctureless Tire Co., capital stock, $200,000; incorporators, F. M. McGready, S. H. Sheldon, Re Roy McGready.

New York—International Auto-Lamp Mfg. Co., capital stock, $300,000; incorporators, H. Agar, N. Agar, T. Gunningham.

New York—Essenkay Sales Co., capital stock, $100,000; to deal in motors; incorporators, H. S. Young, B. F. Abbott, W. C. Oliver.

New York—American Society of Automobile Owners; incorporators, R. S. Kennedy, J. C. Murray, A. Woods.

Queens, N. Y.—Far Rockaway Motor Cab Co., capital stock, $25,000; incorporators, E. Sommerich, J. L. Steinman, A. Behal.

Sewaren, N. J.—Perth Amboy Transportation Co., capital stock, $25,000; to operate motor cars for hire; incorporators, I. J. Freeman, L. Chester, I. Robbins.

Salem, Mass.—Motor Sales and Service Co., capital stock, $25,000; incorporators, G. B. Nason, E. S. Adams, G. P. Kinsman.

Toledo, O.—Rapp Mfg. Co., capital stock, $15,000; to manufacture spark plugs and motor car engine accessories; incorporators, S. W. Rapp, C. D. Stone, S. L. Thorburn, O. L. Hankison, C. D. Few.

Westfield, N. J.—Darby Motor Car Co., capital stock, $25,000; to manufacture motor cars, etc.; incorporators, L. D. Darby, H. C. Darby, A. B. Darby.

PLEASURE CARS

ALCO
Motor Cars

6-cylinder, 60 H. P. Touring Car—7 passenger	$6000
6-cylinder, 60 H. P. Petite Tonneau—5 passenger	6000
4-cylinder, 40 H. P. Touring Car—7 passenger	4500
4-cylinder, 40 H. P. Petite Tonneau—5 passenger	4500

IT takes a year and seven months to build one Alco. A month alone is required to build the rear axle. The largest drop hammer in the world—weighing 250,000 pounds—smites it out of a solid billet of steel. Per pound in the raw no materials cost as much as those in the Alco.

Gigantic ovens, registering as high as 2,000 degrees Fahrenheit heat-treat and render well-nigh unbreakable every part where strain occurs. To the man who loves a thing well made the Alco is a joy forever.

Thirty-two page Catalog sent on request.

AMERICAN LOCOMOTIVE COMPANY, 1895 Broadway, NEW YORK

Builders of Alco Motor Trucks and Alco Taxicabs

Chicago Branch: 2501 Michigan Avenue.
Boston Branch: 567 Boylston Street.

Canadian Headquarters:
4280 St. Catherine Street, West, Montreal.

Twice winner of the race for the Vanderbilt Cup

entered, the average fine was $46.62, and the average costs amounted to $3.09. The rates of speed varied from 21 to 44 miles per hour, in the cases convicted, the average speed being 23 miles per hour. The cosmopolitan nature of the defendants may be seen from the following list, in which they are classified according to their occupations:

Agents	4	Liverymen	2
Attorneys	2	Machinists	14
Bakers	4	Manufacturers	6
Banker	1	Merchants	18
Barbers	2	Messenger	1
Bookkeepers	4	Milkman	1
Business agents	2	Musician	1
Brewer	1	Painters	2
Broker	1	Peddler	1
Bricklayer	1	Physicians	3
Carpenters	2	Plasterer	1
Cashier	1	Plumber	1
Chauffeurs	31	Porter	1
City employe	1	Printers	6
Clergymen	2	Principals of Schools	2
Clerks	20	Roofer	1
Clothing cutter	1	R. R. employes	3
Collector	1	Salesmen	14
Contractors	7	Steamfitter	1
Designer	1	Stenographers	4
Electricians	12	Students	5
Engineers	3	Tailors	3
Foremen	2	Teamsters	2
General managers	2	Tinsmiths	2
Grocer	1	Timekeeper	1
Horseshoer	1	Toolmaker	1
Housekeeper	1	Trust officer	1
Importer	1	Undertaker	1
Janitor	1	Waiters	2
Jeweler	1	Woodworkers	2
Laborer	1		

The claim is advanced for this court are that 90 per cent of the defendants plead guilty, which claim is not substantiated in the first month's experience, but which may yet be shown to be a fair estimate.

Regarding the slow speed of the average arrest, it has been charged that the low figure indicates that the high-speed drivers are still escaping, while the unfortunate, who just go over the limit, are the ones that are caught. In defense of this, the police authorities point out the fact that 30 miles per hour looks like 50 to the average observer, and one case of this speed impresses one more than a dozen at a slower speed. It cannot be denied, furthermore, that the condition of the pavement, even on the best streets, is not conducive to great speed, and with the number of crossings, other vehicles and street cars, few drivers have the hardihood to greatly exceed this average, which seems faster than the figures indicate, when witnessed, because of its rarity.

Although this court may be far from perfect, it is believed to be far and away the superior of any other judiciary institution that has yet been applied to offences of this nature, and with the coöperation of the police and legislative departments of the city, should exert a strong influence in decreasing the alarming number of fatalities resultant from careless driving.

That the police department is doing its part is evidenced by the work of the motor cycle squad, and the precautions taken to insure the accuracy of the speedometers used. The council also has done its part in this particular in the passing of cut-out, muffler explosion, and street car ordinances. The last named prohibits motor cars from passing to the right of street cars during stops of the latter to take on or discharge passengers. Violations of these laws are taken before the local judges, except when the charge includes violations of the state law also, when the case is tried in the motor vehicle court.

In cases where chauffeurs are given heavy fines which they are unable to meet, the court is disposed to be very liberal, allowing the cases to be continued, granting parole, and giving the worthy ones ample time to make payments without depriving themselves or their families of the necessities of life. In only extreme cases of recklessness or contempt, are these offender sent to the house of correction, although it is entirely within the power of the judge to exercise his own discretion in this particular.

Knight-Argyll D

English Court Decided Against Inventor of Sli Patent Not Invalidated, Judge Says, But Covers Only Reciprocating Mo

CHICAGO, July 31—A cablegram received today from London by L. B. Kilbourne, partner of Charles Y. Knight, inventor of the Silent Knight engine, conveys the information that the suit against the Argyll company has been decided adversely to the Knight interests, but that an appeal has been taken, with strong hopes of ultimately winning.

According to the cablegram, the decision was based upon the legality of the amendment made in 1908 to the first claim of Knight in 1905. The English judge hearing the case refused to read the claim as amended on the ground that the scope of the patent was widened thereby, which is denied by the Knight interests. It is stated that former practice always considered an amendment through the comptroller as final. The judge held that the Knight patent is not invalidated, but holds that it covers only the reciprocating motion. He gave Mr. Knight leave to amend the error in the specification. After consultation by Knight's lawyers, it was unanimously decided to appeal.

When the new Argyll single sleeve-valve engine made its first appearance at the Olympia show in London last November, proceedings immediately were commenced against Argyll, Ltd., by Knight & Kilbourne, alleging infringement of the British Knight patents granted in 1905. There are four claims in the patent of Knight & Kilbourne referred to, the first and last ones being those against which infringement is alleged. The defendants denied the infringement and set up the defense of anticipation and lack of novelty, and, in turn, claimed revocation of the plaintiff's patent. Among the expert evidence set up on behalf of the plaintiff was Dugald Clerk. One of the drawings in the Knight patent aro discussion centered which the valve s the reciprocation of not through the use double sleeves.

It was shown ir drawing, when t plotted out, the c the compression s claimed that the i it was unworkabl not register corre gued that patent tended to be wor error was only th it was such that s it right without di

NEW PLANT FOR

Milwaukee, Wis man Motor Car street, Milwauke Stegeman commer the big manufac worth, Linus an Milwaukee, in t turing district, a the capacity to o per year. The equipment from already has begu by August 10. chinery has alre

SIMMS COMPAN

New York, Jul work of the Sim field, N. J., which the Assets Realiz management turn of the Edwards completed. The company was $1, The new capital 000 new capital preferred stock a all paid up.

This new fina out all of the o and provides a $300,000, which, $100,000 worth o the company in its work.

The organizat the start, havin the payroll and as the organizati son, Racine, Wis manager. He f and general ma the Case compa of magnetoes ar

Reorganization

Detroit Company, Succeeds H. A. Output of Factory Will be In- Six-Cylinder Model Added

DETROIT, Mich., July 30—At a meeting of the directors of the Lozier Motor Co. held in this city on Monday, plans for reorganization which have been under consideration for some time were culminated. H. A. Lozier has resigned as president of the company and is succeeded by H. M. Jewett, of the Paige-Detroit Motor Car Co. Raymond B. Fosdick, of New York city, was made vice-president and treasurer, while E. P. Earle and H. E. Kahler, also of New York, were made members of the board of directors.

Arrangements have been made to increase the output of the factory, and while only one model, a six-cylinder, 50-horsepower machine, has been manufactured heretofore, it is planned to put out a smaller six of less horsepower, in addition. This will necessitate the increasing of production facilities, and consequent enlargements of the factory, so that it is probable the new car will not be ready for delivery for 2 months or more.

Mr. Jewett is closely allied with the affairs of the Paige-Detroit company, being president of that concern also, as well as head of the firm of Jewett, Bigelow & Brooks, wholesale coal merchants. Mr. Fosdick is at the present time commissioner of accounts of New York city and manages all the business affairs of that city. Messrs. Earle and Kahler are well known in the financial circles of the metropolis.

The policy of the Lozier company will remain unchanged by the reorganization. Mr. Lozier's resignation as head does not mean he has severed his connections with the company, as he will continue to take an active part in the concern's affairs. The rest of the Detroit organization remains unchanged.

KNIGHT'S EUROPEAN BUSINESS

Chicago, July 27—L. B. Kilbourne, partner of Charles Y. Knight, inventor of the sleeve-valve motor, is back in Chicago after a lengthy visit in Europe, some of which time was given up to attendance at the trial of the suit of the English Argyll company.

"Our business in Europe is growing in leaps and bounds," says Mr. Kilbourne. "The Daimler company, which made 2,600 Knight-engined cars for 1912, has made its plans for 3,000 for 1913. In addition it is selling many engines to others in that country. The Sidderley-Deasy already has used 450, fitting them to both fours and sixes, while a considerable engine business is done by Daimler in Germany, France and America. The Daimlers are making more six-cylinder cars than fours. In Belgium the Minerva people are erecting new factories and planning to increase their output from 1,200 to 2,000. Panhard of France has added a Knight six and also is making a small four, making three models of Knights in all, while the Mercedes company in Germany has brought out two new Knight models to go with the one it originally had. One of these is 4¾ by 5.

"The Sigma-Knight builders in Switzerland are at the present time reorganizing their company with the idea of broadening out. They started out with only the Switzerland rights and found they were handicapped by being so limited. They saw the opportunity to get the Italian rights and they have taken an option on this privilege, which will be taken up when the company is reorganized. One of those interested in the Switzerland company is young Levassor of France. The Sigma-Knight is made in two models, one 18 horsepower and the other 25½ and the car is a success.

"It was because of this reorganization that the Sigma did not start in the French grand prix. It is not generally known, though, that it did run in the Targa Florio in Sicily. An agent bought the car himself and entered it and it only was because of hard luck that he did not win. He writes that at the end of 200 miles he was 35 minutes ahead, when he lost his gasoline tank. He had to make a new tank and wait 2 hours for more gasoline, yet he finished tenth."

ATLAS SALE POSTPONED

Indianapolis, Ind., July 29—In the superior court today Judge Weir postponed the sale of the Atlas Engine Works to August 12. This was done with the consent of the receiver at the request of M. L. Thompson, representing a prospective bidder and the Baldwin Locomotive Works, Philadelphia, a heavy creditor.

Mr. Thompson said that the company which contemplates buying the Atlas plant has not yet been organized, but that the men who expect to go into it have ample funds to buy the property at a figure $25,000 higher than that offered by another prospective bidder, in which Walter E. Flanders, of Detroit, is said to be interested. It is understood the Detroit interests will still be willing to submit a bid as late as August 12, although they desire the plant at as early a date as possible.

Fred C. Gardner, receiver of the Atlas company, has completed an inventory and his appraisement is $1,135,723.77. The inventory and appraisement is made up as follows: Cash on hand, accounts and similar items, $234,905.40; buildings, $518,056.50; grounds $117,600; machinery, $351,845.13, and sprinkling and water system, $50,000.

The prospective bidder will have to agree to assume a bond issue of $1,050,000, pay another bond issue of $105,000 and pay mercantile accounts and the cost of the receivership proceedings amounting to about $80,000.

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Proper Nomenclature Needed

THERE is grave necessity for more accurate nomenclature in the 1913 motors because of the use of electric motors for self-starting purposes and also because of the use of electric motor generators for generating electric current for lighting and often current for self-starting and ignition purposes. Here is an example of how much confusion can arise because of lack of uniform nomenclature for the various parts connected with the electric system of a car: One concern uses not fewer than three electric units, the magneto for ignition, an electric motor for starting and a motor-generator for lighting and charging the lighting and starting batteries. Many people use the word "motor" for three different parts: First there is the four-cylinder gasoline motor which drives the car, which it has been customary to designate as "motor" for many years and which is a suitable name. Granted that "motor" is the proper appellation for it, then it at once is evident that the word "motor" must be modified if used to designate an electric motor for starting or another unit which at one moment may be used for generating current and at another moment serves to consume current from a battery and transfer it into power to crank the gasoline motor.

A SUITABLE form of nomenclature would be as follows: Use the word "motor" to apply to the standard gasoline power plant of two, four or six cylinders; use the compound word "motor-generator" to designate an electric unit which works in conjunction with a storage battery and which draws current from the battery to start the gasoline motor or when the gasoline motor is running is driven by it and generates electric current which it delivers to the storage battery or direct to the lighting or ignition system; and use the expression "starting motor" to designate an electric or other type of motor which is used exclusively to start the gasoline motor only.

IT will be noted that the "motor-generator" is a two-fold machine; at one time it produces electric current and another time it consumes it. In electric parlance, when an instrument makes current it is a generator, and when it consumes current and gives forth mechanical power it is a motor, so that it is entirely satisfactory that a machine which can do both roles should be styled a "motor-generator." It is difficult to clearly outline the present field of these different units. The motor-generator on one make of car is used as a motor to start the gasoline motor and as a generator to charge a battery or lighting and starting. On another car the motor-generator is used solely for starting. A third concern uses but an electric generator, constantly driven.

Improving the Wiring

WHEN you build a garage in a large city it is necessary to refer every detail of the electric wiring to the insurance underwriters who put limitations on the height of plug sockets from the floor, on how the wires shall be concealed, on where switches must be located, on how drop lights shall be placed and many other details. Contrast this care with that shown in wiring a motor car for ignition, for electric lights and for electric starting. With many systems poor wiring has given more trouble than the current generators and other units in the system. There is an entire lack of adequate protection against water. Leave many cars standing out on the street in a heavy rain and the bonnet does not afford enough protection to prevent short-circuiting when the car is started. The severe snow storms of the past winter put out the electric and ignition sets on many cars and left them stranded on the street. In every instance it was short-circuiting, due to lack of protection. Many concerns fitting electric lighting outfits have placed the switchboards so that they are too close to the back cylinder and the heat is sufficient to cause shorts with their never-ending program of troubles. The defective wiring could be analyzed much further. The proximity of wires to the exhaust manifold and the muffler has caused scores of stops.

THE next conclusion is that there is much need for improvement in electric wiring on cars. Today it is one of the crudest systems in the car. A car is subject to constant vibration, yet the wiring is often much poorer than is done in the average house or office building where it is entirely protected from the weather, from heat and is not subject to vibration. For next year there has been a general improvement in the wiring schemes. Many makers are carrying their wires to the headlights, to the dash lamps, to the tail lamps, to the license tag and to the batteries in metal tubes so that water protection is afforded. More precautions have been taken in supporting these tubes on the chassis frame and in general more rational attention has been given to this question.

THERE is still much room for improvement. Makers who persist in placing the magneto on the front motor arm must give more protection from the radiator than they have in the past. This protection can be in the form of water and mud aprons on the front of the car to prevent the water splashing through the radiator or in the form of separate covers for the magneto and its wiring. One maker is going still further for next year by entirely inclosing the spark plugs on the cylinder heads with aluminum plates, making it quite impossible for water to leak through the bonnet and reach the plugs. This example should be carried much further.

Get the Habit

GETTING drivers in the habit of signaling with the hand when going to stop, when slowing up, when turning to the right or when turning to the left is difficult. In large cities the education has been rapid because the driver must use it for his own protection, but in the many medium-sized cities there is a conspicuous ignorance of such rules, and generally the drivers from such cities when they get into big centers run amuck with the police or other drivers because of disobedience to recognized signals. No matter what the city, the driver should accustom himself to such rules, and he can only get in the habit of such by continual attention to it in his home city or town. The car owners will work a great benefit to the industry if they will recognize this simple rule and many accidents will be averted.

Badgers Try Something Entirely New

Fort Atkinson Club Sends Out Party of 350 Boosting Good Roads

FORT ATKINSON, Wis., July 29—Something entirely new, and by the way, eminently successful, in the line of boosting the good roads movement in limited territories, incidentally advertising a city and its industries, was the motor caravan of the Fort Atkinson Automobile Association, which left the city of Fort Atkinson on Tuesday morning, July 23, covered 72.7 miles in a circle, and returned at 6 o'clock p. m., Tuesday. Sixty-six cars participated, the sixty-six drivers being members of the F. A. A. A. So productive of good was the tour that a second will be run on August 23, when a route south of Fort Atkinson and including Whitewater, Janesville and Edgerton, will be covered.

The tour was different from anything of the kind any motor club in the west, at least, has ever attempted. Outside of its striking originality, the fact that a club in a city of 3,250, having approximately 100 members out of a possible 126 owners, accomplished a stunt of this kind, has opened the eyes of the Wisconsin State Automobile Association officials as well as those of the Milwaukee Automobile Club, the largest members of the state body.

New Scheme Outlined

For the benefit of clubs throughout the United States who may be seeking for means to stimulate highway improvement spirit in addition to advertising their towns and inducing a stronger co-operation among members, it may be said that the tour was conducted under a set of rules formulated by the club's executive committee, and executed by a staff of officials, including a pathfinder and pilot, pacemaker, starter, checker and assistant checkers.

All cars were required to line up on the right side of Main street, Fort Atkinson, beginning at the starting line in front of the Hotel Fort, at 9 o'clock a. m. Each driver proceeded to the hotel lobby to draw his number from a box, which was exchanged for two squares of canvas, neatly painted with the corresponding number, to be attached over the hood. At 9:30 o'clock the starter, Gavin Cuppins, told No. 1 driver to take the starting position. Immediately thereafter No. 1 was sent away, and as soon as the car reached the first street intersection, No. 2 was given the word, and so on until No. 66 was off. The cars were required to keep 300 feet apart on the road, and no car was permitted to overtake another unless the car in front became disabled. A schedule of 15 miles per hour obtained.

The caravan was led by President Joseph P. Specht of the Ft. A. A. A., who followed ½ hour behind the pathfinder and confetti car, in charge of G. E. Ward, and ½ hour behind the pilot and pacemaker's car, in charge of W. D. James, who officiated as general manager of the tour. Between the pacemaker and the president's car there ran a Garford 3-ton truck, carrying the Fort Atkinson military band. The truck is owned by the R. Heger Brewing and Malting Co., of Jefferson, Wis.

The rules required that each car carry at least one Fort Atkinson pennant, two United States flags, and if desired, one sign on each side of the car advertising some business or industry of Fort Atkinson, which is noted as a creamery, canning, sausage and farm implement city, not forgetting that it is the home of former Governor William Dempster Hoard, the best known practical dairyman in the country.

The itinerary was from Fort Atkinson to Jefferson, 6 miles; to Johnson Creek, 5 miles; to Watertown, 11 miles, and Oconomowoc, 13.2 miles. At Jefferson and Johnson Creek 5-minute stops were made for receptions by the business men. At Watertown the motor club, recently organized, joined with the Business Men's Association in extending a ½ hour welcome. Oconomowoc was the noon control and the Woodland Park hotel and grounds were thrown open to the tourists, who remained 2 hours. Following dinner, a tour of the Oconomowoc lake region was made, the famous Pabst stock farm, Ardmere duck farms and all of the big summer homes of Chicago and New York people being visited. At the duck farms the tourists saw the notable sight of 5,000 ducks on foot in one enclosure and 3,500 ducks just hatching out in incubators.

At 3 o'clock the cars were again lined up as at the start, and sent away in similar fashion, the route being through Golden Lake, Rome, Hebron and Bark River to Fort Atkinson, 37.5 miles. It is interesting to note that just before the tour was scheduled to start from Fort Atkinson a heavy rain set in, but every one of the sixty-six cars which signed entry blanks remained and continued through the entire tour.

Boom for Good Roads

The tour was called the Fort Atkinson A. A. good roads tour, which in itself served to attract wide attention, for the city is known as the most progressive in the way of highway improvement in the state of Wisconsin. It was here that the third annual Wisconsin State A. A. reliability tour, July 15 to 19, found the finest roads encountered in the 625 miles of the run; also the tour was stopped at Fort Atkinson for 20 minutes to be entertained by the F. A. A. A. and hear a stirring good roads address by the man who built the first improved highway in Wisconsin, ex-Governor Hoard.

There were 350 Fort Atkinson people in the tour. An indication of the interest displayed by cities en route is found in the fact that at the noon control the Woodland Park hotel issued special menu cards bearing the seal of the F. A. A. A. and a quotation from Governor Hoard on good roads.

Despite the rain and wet roads the Garford truck maintained a schedule of 12 miles per hour for the entire distance and incidentally showed what a benefit will result when roads are built so that motor trucks may travel without fear of being torn to pieces.

Coming Motor Events

August 5-7—Pacific Highway convention; San Francisco, Cal.
August 8—Minneapolis-Winnipeg tour.
August 8-9—Banta trophy team match, Chicago Motor Club.
*August 8-10—Galveston beach meet; Galveston, Tex.
August 10—Hill climb; Whittier, Cal.
*August 30-31—Elgin road races; Chicago Automobile Club; Elgin, Ill.
*September—Commercial vehicle run; Chicago Motor Club.
September 2—Track meet at Winnipig, Canada.
September 3-6—Chicago Motor Club's truck demonstration.
September 17 — Grand Prix; Milwaukee, Wis.
*September 20—Wisconsin challenge and Pabst Trophy races; Milwaukee, Wis.
*September 21—Vanderbilt road race; Milwaukee, Wis.
September 17-20—Fire engineers' convention; International Association Fire Engineers, Denver, Colo.
September—Track meet; Universal Exposition Co., St. Louis, Mo.
*October 7-11—Chicago Motor Club reliability run, Chicago.
October 12—Track meet; Rockingham park, Salem, N. H.
November 6—Track meet; Shreveport Automobile Club, Shreveport, La.

*Sanctioned by A. A. A.

SHOWS

September 23-Oct. 3—Rubber show, Grand Central palace, New York.
September 26-Oct. 6—Exposition agricultural motor cars, Bourges, France.
November 8-16—Olympic show; overflow November 22-30 Agricultural Hall.
December 7-22—Paris salon.
January 4-11, 1913—Cleveland show.
January 11-18—New York pleasure car show; Automobile Board of Trade; Madison Square Garden and Grand Central Palace.
January 11-22—Brussels, Belgium show, Centenary Palace.
January 20-25—New York truck show; Automobile Board of Trade; Grand Central Palace and Madison Square Garden.
January 20-25—Philadelphia show.
Jan. 27-Feb. 1—Detroit show.
February 1-8—Chicago show.
February 10-15—Minneapolis show.
February 17-22—Kansas City show.
Feb. 24-March 1—St. Louis show.
March 3-8—Pittsburgh show.
March 8-15—Boston show.
March 17-22—Buffalo show.
March 19-23—Boston truck show.
March 24-29—Indianapolis show.

Twenty Farmers Make Perfect Scores

DALLAS, Tex., July 30—The tour for the farmers and ranchmen of Texas conducted by the Farm and Ranch Publishing Co. ended here Saturday morning with twenty of the twenty-six starters having perfect scores. The Holland trophy was awarded to W. H. Camp, of Milan county, who drove a Reo. Mr. Camp showed his sportsmanlike spirit by offering to put up the cup for a similar contest next year.

In addition to Mr. Camp the following also made perfect scores: W. R. Bishop, Franklin six; S. J. Hall, Hupmobile 32; J. M. Howe, E-M-F; W. R. Mickle, Chalmers; J. R. Pennington, Buick; R. B. Dunn, Mitchell; B. W. Bean, Studebaker; D. W. Rutherford, E-M-F; O. L. Sims, Overland; J. Mantel, Hudson; H. V. Kendrick, Buick; W. R. Newton, Ford, and R. G. Roach, Ford.

The tour extended over more than 700 miles of Texas territory. Leaving Dallas Monday morning, the turning point was San Antonio. This place was reached Wednesday afternoon and the contestants spent the night in that city, beginning their trip home on Thursday morning. No mishaps occurred to any of the contestants and the tour is declared to be the most successful ever held in Texas. As a result of this tour it is expected that the motor car hereafter will be put to further use in Texas, farmers seeing the advantage in using cars for the farm.

At the banquet given on the return, George W. Baker, president of the Dallas Automobile Club, declared that the tour had done more, in his belief, for the motor industry of the South than anything that had ever taken place. He declared that hereafter, in his opinion, Texas would begin the building of more good roads. He stated that the farmers and ranchers' run had done more to advertise Texas and prove the sterling worth of the Texas motor industry to the world in general than any other event ever staged. He spoke of the worth of the tour in regard to the establishment of good roads in Texas. He said that on some parts of the trip the roads were fine, but that in the majority of places the going was rough in the extreme. Mr. Baker's remarks were indorsed by the contestants.

Mayor Holland welcomed the tourists back to the city and said that the tour had been of great value to Dallas generally.

There probably never has been an endurance run that contained so many unique features of special interest as this one. Only farmers and ranchmen operating and living on their own farms were eligible for this contest, thereby eliminating any professional element and adding a spirit of sociability that would have been impossible in the conventional endurance run.

Texas Ranchmen, in Reliability Run, Prove They Are Good Drivers

Many of the farmers brought their wives and families along and it was no unusual sight at controls to see a wife or daughter filling a gasoline tank while the son stood ready at the crank, with the farmer at the wheel ready to be off on the day's run without a moment's delay.

The run showed that the farmers were certainly resourceful in handling emergencies that would have discouraged most city drivers. For instance, R. G. Roach in a Ford sheared the bolts off of one of his rear wheels while rounding a sharp turn in the road. The wheel bounded off into a field. Mr. Roach borrowed the bolts off of a cultivator from an obliging farmer, assembled his wheel and landed in night control ahead of schedule. Another farmer who had smashed his gearbox made a temporary repair with a few yards of barb wire and a packing of axle grease. The average farmer owner is used from necessity to working out his own repairs independent of garage help and there are few mechanical difficulties that can stump him.

At every little or big town along the route squads of cars headed by officials came out to escort the advance guard into town, and noon and night controls were invariably the scene of receptions, barbecues and enthusiastic good roads meetings. These meetings were addressed by some of the best known educators and good roads advocates in the state and undoubtedly these assemblies will have a strong moral effect in bringing into line the counties that have hitherto been backward in voting for road improvement.

GENERAL MOTORS PROSPERING

New York, July 27—Anticipating its floating obligations by paying them before the due dates, General Motors has liquidated its seasonable loans and it is announced by the management that $1,000,000 will be deposited with the Central Trust Co. within a few days on account of the installment of 6 per cent bonds which are due October 1. The balance of the installment is not due for 60 days.

General Motors floated $15,000,000 of gold notes 2 years ago this coming fall for the purpose of retiring floating obligations of the company and its subsidiaries and to furnish working capital. A part of this issue was so arranged that it had to be paid off in installments. Last year the installment was $1,500,000 and a similar amount will be retired this year. Next year, under the agreement $2,000,000 will fall due and the same amount in 1914. The following year the remainder of the issue, amounting to $8,000,000, may be discharged at the option of the company or may be continued for 20 years. The company has the privilege of calling the bonds at any interest date on payment of 102½ with accrued interest.

The action of the directors in setting aside such a sum as $1,000,000 for bond payment 60 days before it is due, attracted much attention in the industry and was taken as a proof that the financial plans of the company have worked out nicely during the past season. The stock responded quickly to the report and advanced sharply to 77½ and 34 respectively for preferred and common.

The fiscal year of the company ends July 31 but the annual report will probably require from 6 weeks to 2 months before ready for publication. It is understood that the company made new high marks along the line.

ALCO TRUCK IN WYOMING

Laramie, Wyo., July 29—Heavy rains that washed away bridges and turned the trail ahead into a sea of impassable mud were encountered by the transcontinental Alco truck crew during the past 2 days.

Now that the roads are comparatively dry the truck was able to start this morning along the road to Medicine Bow. In 30 days of running time it has passed through eleven states and has rolled up a mileage of 2,550 miles since the start from the factory of Charles W. Young & Co., its owners, of Philadelphia.

BUFFALO ADDS NEW COMPANY

Buffalo, N. Y., July 30—A substantial addition to the local industry was made here today when the Mutual Motor Car Co. was incorporated with capital of $125,000. Directors of the new corporation are: Albert Poppenberg and Frederick C. Carter, both of whom are connected with the Poppenberg Motor Car Co., and Orson E. Yeager, president of the Victor Motor Truck Co., and also president of the Buffalo Chamber of Commerce. The offices and salesroom of the new concern will be at the Poppenberg Motor Car Co., 674 Main street. Pleasure cars may be handled exclusively, although it is probable that commercial vehicles will be added later to the selling list. The new concern is entirely a dealers' proposition and no factory for the corporation will be required.

OLIVER COMPANY DISSOLVED

Detroit, Mich., July 27—A decree dissolving the Oliver Motor Car Co., bankrupt, was signed and filed by Judge Mandell on Friday in the United States circuit court. An order directing the sale of machinery has also been issued by the judge.

TREGO QUITS THOMAS COMPANY

Buffalo, N. Y., July 29—Frank H. Trego, chief engineer of the E. R. Thomas Motor Car Co., Buffalo, N. Y., has resigned, the resignation to take effect September 1.

Oldfield Bill Coming Before House

Patent Measure Will be Reported Out of Committee This Week

WASHINGTON, D. C., July 26—Of far-reaching importance to the motor car and accessory industries is the fact that the Oldfield patent bill will be reported to the house of representatives next week, and according to Representative Oldfield, chairman of the committee on patents, will be passed by the house next December. The measure aims to change the patent laws and if enacted will upset so many existing conditions of purchase and sale that a short phrase to describe its sweeping character is difficult to find. Briefly, the feature of the bill is the proposition to eliminate fixed prices on patented articles. In other words, a motor car, a spark plug, carbureter or any other patented article now to be bought at approximately the same price in Washington, Chicago or any other American city, if the Oldfield bill is enacted may be sold at any price the dealer can get for it.

The bill aims a sharp blow at many big manufacturing interests, and as it was originally drawn it produced numerous protests from manufacturers, inventors and patent lawyers. However, some changes have been proposed for the bill, and when it is reported certain features will have been modified. As it will be reported the bill will have four main features.

One of them will require that every patent shall expire within 19 years after the application has been filed, exclusive of the time used in the patent office, and allowing the inventor 2 years to obtain his patent allowances. Mr. Oldfield's idea on this is that big concerns with unlimited opportunity for legal network can block all sorts of small inventors by keeping their claims at slow speed, filling the patent office with applications and not really wanting to get a patent, but desiring to stop the way for those behind. It is understood that since the possibility has been realized of this Oldfield bill becoming a law some big industries have bent every effort at getting their claims patented, when heretofore they were content to linger and delay to any extent.

Of especial importance to everyone who makes purchases, however, is section 32. Probably the worst nightmare some of the manufacturers of the country could have would be the dream of the enactment of this section. For years the federal courts have held that any storekeeper who sells a patented article at a price less than that at which the manufacturer says he can is guilty of an infringement of the patent. As originally reported the bill would have wiped out the manufacturer's right to set a price. As it will be reported this time it will state that it is not an infringement of a patent to resell a patented article at a lower price than that fixed by the manufacturer. The change means that when a manufacturer sells his goods to a storekeeper, if he can get it he can obtain a contract not to cut prices and that if the storekeeper takes it into his head to hold a bargain sale on the manufacturer's goods he can do so without being called a patent infringer and bringing down the wrath of the court in the shape of an injunction. Of course, the manufacturer will get out his contract and sue the storekeeper in the civil courts. That will be another matter. Says Mr. Oldfield on this subject: "And the civil courts will never uphold the manufacturers." The manufacturers say industry and business will be upset. "If a man cannot do business without some special privilege of this sort he ought not to be in business," says Oldfield in reply. "And I regard this price maintenance the greatest of all privileges."

One of the big features of the bill consists of several amendments to the Sherman anti-trust law. It makes the Sherman law apply to all patent monopolies. Big concerns which buy up all the patents in sight and fail to use them will have to expand their industry or drop their unused patents. Under these amendments the "compulsory license" clause of the bill affects the patent monopoly situation also. Under this clause a manufacturer is forbidden to buy a patent and let it lie idle for the sole purpose of stifling competition. The amended bill which will be reported exempts the original inventor from this clause. It gives him in that way time to get a manufacturer interested in his article.

RECENT EASTERN LITIGATION

New York, July 30—The American Ever Ready Co. has entered suit in the United States district court against the Interstate Electrical Novelty Co., charging infringement of Fuld's patent covering a device for testing electric batteries. The device consists of a pair of holes drilled through the casing of a battery, opposite the battery terminals. They are so arranged that it is possible to test the battery without breaking the seal. The utility of the idea is that where batteries are kept in stock for considerable lengths of time and are subject to deterioration, it has been customary to open the containers to discover whether or not they were in salable condition before a sale. After the seals have been broken, there is no way in which to determine whether the battery has been used. Under the patent, the claim is made that while the battery can not be used without breaking the seals, a thorough test can be made as to its efficiency. Victor C. Borst is handling the case for the complainant.

Petition has been filed by the American Taximeter Co. to have the Kayton Taxicab and Garage Co. declared bankrupt. The original motion for a receiver was denied, but Williams, Folsom and Strouse, attorneys for the petitioning creditor, announce that it will be renewed. The liabilities of the concern are estimated at $14,000 and the assets are placed nominally at $10,000 by the attorneys for the petitioner.

Alleging infringement of the Corcoran patent on a screw adjustment used in a certain type of vehicle lamp, the Victor Lamp Co. has entered suit against the Knickerbocker Brass Goods Co. of New York asking an injunction, accounting and damages in the United States district court. The device is covered by patent No. 980,493, issued in January, 1911, and transferred to the Victor company in June, 1912. Louis F. Perl is handling the matter for the complainant.

Injunction was granted against the Auto Surplus Stock Syndicate and its president, forbidding them from violating the Mosler license to sell spark plugs. Albert Falck for the Mosler company showed the United States district court the contention of the complainant that the syndicate was selling the plugs in suit at less than the scheduled price.

CONDITION OF RUBBER MARKET

New York, July 30—Crude rubber sagged throughout the past week in the markets of the world, the decline being measured by about 4 cents a pound in the fine up-river grades. Trade was of small proportions and there was more selling pressure than buying inquiry. The trade generally appears to be awaiting developments. The few sales that were made seemed to be in the nature of profit-taking on purchases made when the price hung around $1.10. It was noted that the offering of considerable lots had to be at fractional concessions in order to produce sales. The buyers were consumers to a greater extent than showed last week.

STUDEBAKER RETIRES BONDS

New York, July 29—Goldman, Sachs & Co. financial agents for the Studebaker Corporation, officially confirm the report that the Studebaker concern has ordered the retirement of $450,000 of the preferred issue floated several months ago. The reason for the retirement of the stock is that the company's business has been on such a large scale that there was no necessity of allowing this stock to remain outstanding.

Kindly give me the best route. Does a license taken out either in New York or Texas entitle one to enter and pass through the states mentioned?—William Pompee.

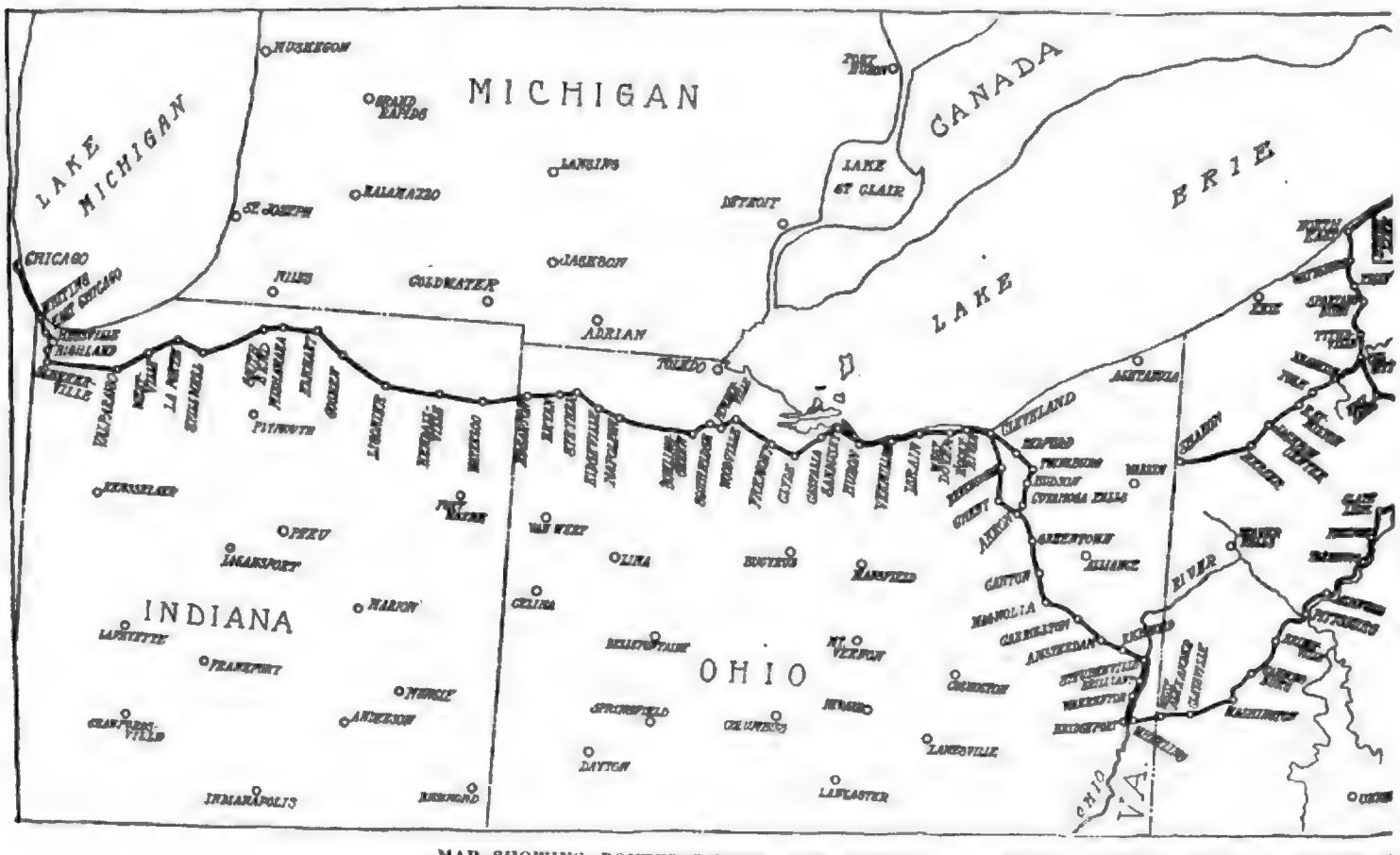
Leaving New York for Albany, some detours from the regular route will have to be made as New York state is very active this season in constructing and resurfacing many of its highways. Cross the Hudson river by ferry at Fort Lee and proceed through Leonio, Hackensack, Hohokus, Suffern, Ramapo, Sloatsburg, Tuxedo, Central Valley, Vailgate and Newburgh. From Suffern the road is fine with the exception of about a mile of rough macadam and a quarter of a mile of rough dirt road entering Newburgh. At Newburgh cross the Hudson on a ferry to Fishkill Landing, Wappinger's Falls, Poughkeepsie, Hyde Park and Staatsburg, then via East Park and the Wurtenburg road to Rhinebeck, thence to Hudson, and Stottsville. Then to avoid road under construction your way will lie through Stockport and Kinderhook, where you will have good roads to Valatia and fine macadam to Albany.

From Albany turning west to Buffalo your preferable way will be via Schenectady, passing through Pattersonville, keeping to the south of the river as the road on the north side will be closed all the season. Go through South Schenectady, Mariaville and Scotch Bush, Amsterdam, Fonda. As the direct route will be closed all the season, cross the river to Fultonville, thence to Fort Plain, and recross the river at Nelliston, then Little Falls to Utica. You will find good roads through Oneida, Chittenango to Mycenal, where turn to the right takes one through Manilus Center, East Syracuse, Eastwood, Syracuse, to Camillus, where you should turn to the left to enter Marcellus. Make turn to the west to Auburn. Ten miles out from Auburn turn to the left at the sign and follow the dirt road to Cayuga, in order to avoid almost impassable roads through Montezuma swamp. There is need of caution on the hill going to the ferry.

Ferrying across at Cayuga, continue through Seneca Falls, Waterloo, Geneva, Mendham with mostly fair roads from Cayuga, except in the villages of Seneca Falls and Waterloo. Then good roads will be found through Canandaigua, Mendon, to Rochester, thence through North Chili, Churchville, Bergen and Byron to Batavia. Fair road will be found from Batavia to Pembroke, with a short stretch that is poor in this vicinity, and the balance good to Buffalo. From Buffalo to Erie you will have good gravel road with only a chance that some stretches between Evans and Silver Creek may be poor, though such conditions are more liable to prevail there in the spring than at this season of the year. West of Silver Creek you pass through Westfield, North East, Erie, with good gravel or stone road continuing through Conneaut, Ashtabula, Unionville, Painesville, and University Circle into Cleveland. Leaving Cleveland through Edgewater park via the boulevard along the shore of Lake Erie, way points will be Lorain, Huron, Sandusky, Clyde, Fremont, Woodville, Toledo, Wauseon, Bryan, Kendallville, Ligonier, Goshen, South Bend, LaPorte, Valparaiso, Merrillville, Schererville, Highlands, Hessville, East Chicago, Whiting, Chicago. Passing through Garfield park, and La Grange, then following the general direction of the drainage canal to the southwest from Chicago will take you through Joliet, Morris, Marseilles, Ottawa, La Salle, Princeton, Sheffield, Geneseo, Moline.

Crossing the Mississippi river into Davenport you will then follow the River-to-River road through Durant, Moscow, West Liberty, Iowa City, Coralville, Tiffin, Oxford, Homestead, Marengo, Ladora, Brooklyn, Grinnell, Kellogg, Newton, Colfax, Mitchellville and Altoona, then to Waukee, Ontarioville, Adel, Dexter and Redfield where the White Pole road gives the best road to Dexter, Stuart, Menlo, Casey, Anita, Wyota and Atlantic. Here the former road is taken up with Omaha, the objective point, running through Marne, Walnut, Avoca, Minden, Neola, Underwood, Weston, Council Bluffs and a crossing is made over the toll bridge into Nebraska.

A section of the Omaha-Denver transcontinental route, which is in excellent condition, is traversed to Millard, Gretna, Ashland, Waverly, Havelock, Lincoln,



MAP SHOWING ROUTES THROUGH NEW YORK, PENNSYLVANIA, OHIO, INDIANA AND ILLINOIS

Emerald, Milford, Friend, Exeter and Fairmont where the Meridan road is intersected. This road extends north and south from Winnipeg, Canada, to Galveston, Texas, and you will follow this to Fort Worth. Turn south on this highway through Brunning Belvidere, Hebron, Chester, Belleville, Concordia, Minneapolis, Salina, Bridgeport, Lindsborg, McPherson, Moundridge, Hesston, Truesdale, Newton to Wichita, Kans. From this point to Wichita Falls, Texas, although a portion of the Meridian road, it is also known as the Chisholm trail. Continuing south from Wichita through Wellington, South Haven, Caldwell, Renfrow, Medford, Kremlin, Enid, Hennessey, Dover, Kingfisher, El Reno, Pocassett, Chickasha, Verden, Anadarko, Apache, Lawton, Emerson, Randlett, and crossing the toll bridge over the Red river north of Burkburnett reach Wichita Falls.

About 8 miles south of Wichita Falls beware of mud hole in wet weather, and if bad go back about 150 yards and make detour through the fields. You should next reach Windthorst, then Antelope, Jacksboro, Whitt, Weatherford, Annetta, Aledo, Ben Brook and Fort Smith.

Your last day's journey from Fort Worth to San Antonio will take you through Crowley, Cleburne, Grandview, Itasca, Hillsboro, West, Drew, Waco. From this point instead of following the railroad to Temple go west through Harris, turning south at McGregor, running through Pendleton to Temple; thence via Holland, to Granger, thence southwest to Georgetown, turning more southerly at this point to Round Rock, Austin, Buda, San Marcos, New Braunfels, Pratt and San Antonio.

As to touring licenses, you are exempt in all the other states through which you tour, with either a Texas or New York license.

PHILADELPHIA TO SYRACUSE

Philadelphia, Pa.—Editor Motor Age—I want a good route from Philadelphia to Syracuse, N. Y., either direct through Pennsylvania or by the way of New York city. I am familiar with the route to New York. I should like road information and hotel accommodations, say, 100 miles apart. Good roads with good scenery would be more to the point than just a short and quick way, for I intend to give five days each way.—Syracuse.

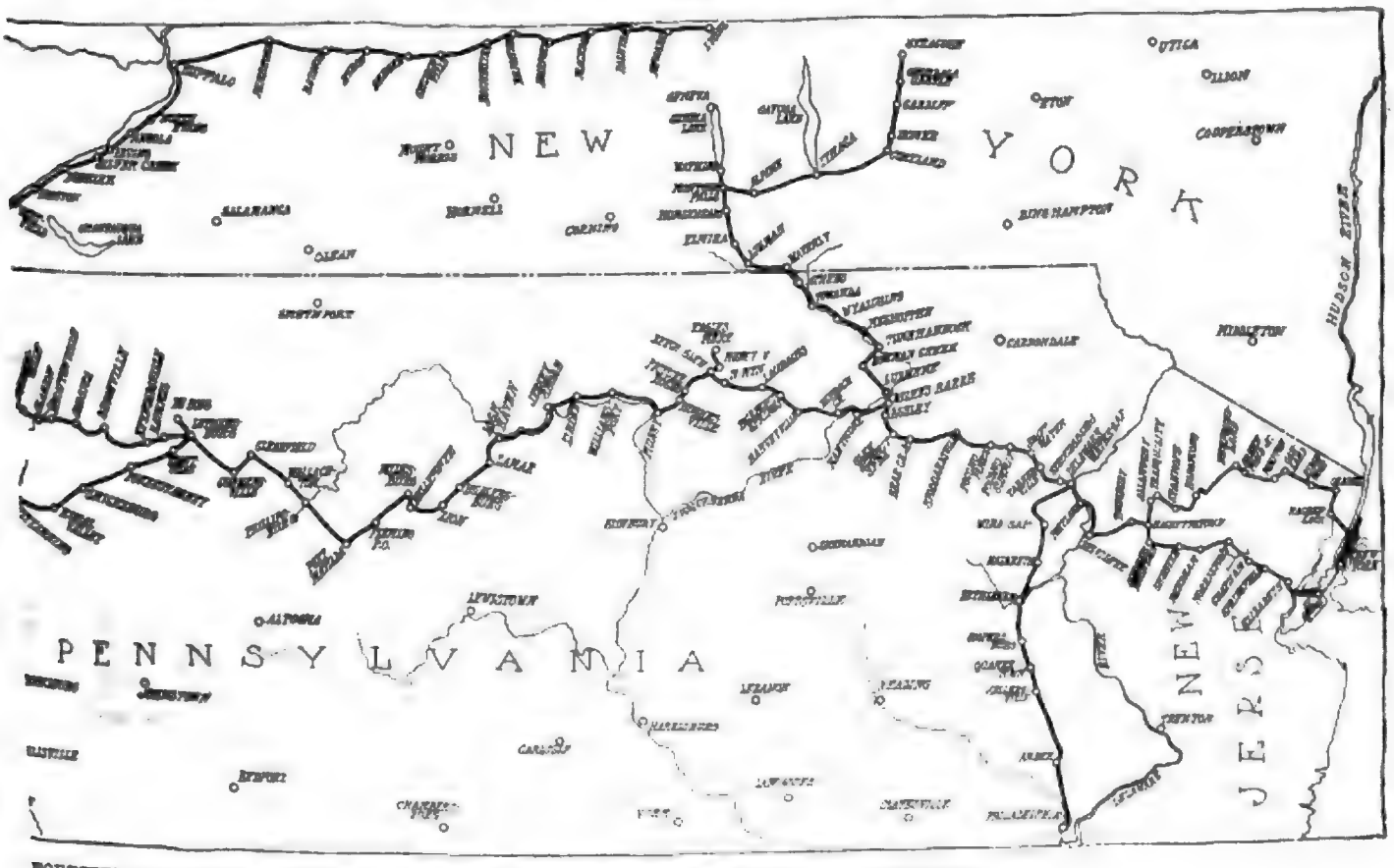
You will not have to go far from home to get into the superb scenic country. Figuring on making Bethlehem the noon stop, you travel through Ambler, Springhouse, Montgomeryville, Sellersville, Quakertown, Coppersburg, Center Valley, Friedensville, Seidersville, Bethlehem, a distance of 66 miles. Here the road diverges to Nazareth, an old Moravian village, the Kittatinny mountain is ascended and the road winds its way through Wind Gap. This is a remarkable pass through the Blue mountains with wonderful views leading through Saylorsburg, Bossardville, Stormville and Delaware Watergap. So far your speedometer will register 102 miles, and as this is a popular summer resort, the hotel and garage proposition is easily disposed of.

Wilkes-Barre, Pa., can be reached through Stroudsburg, Bartonsville, ascending the Pocono mountains over excellent macadam and bearing to the right through Pocono Summit, Naomi Pines and Stoddartsville, which is a distance of 56 miles. This will probably be the stop for the first night.

The next stretch to Elmira, N. Y., 109 miles, is through possibly the most scenic part of Pennsylvania, and it is a succession of steep climbs and descents which necessitates great care in driving and the brakes in the best of condition. Crossing the Susquehanna river just out of Wilkes-Barre, continue through Luzerne, Fernbrook, Kunkle, Bowman Creek, Tunkhannock, Wyalusing, Wysox, Towanda, Athens, Waverly, Lowman and Wellsburg. A short run of 23 miles will find you in Watkins by way of Horseheads and Montour Falls and 26 miles more in Ithaca through Burdett, Bennettsburg, Reynoldsville, Trumansburg, Jacksonville.

The best road from Ithaca to Syracuse is by way of Varna, Willow Glen, Dryden, Cortland, Homer, Tully Center, Cardiff, being a distance of 57 miles.

As your route lies through a summer resort section, hotel and garage accommodations need not be worried over. They are all specially courteous and attentive to motorists.



EQUESTED BY READERS OF MOTOR AGE WHO ARE PLANNING LONG TRIPS IN THE COUNTRY

Horses and Horsepower

Mechanical and Animal Energy Analysed and Compared for Illinois Motorist

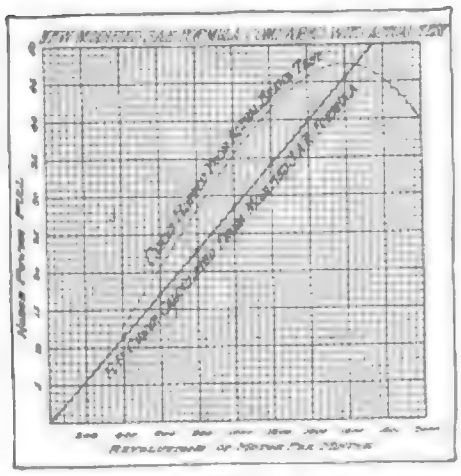


FIG. 1—COMPARISON OF NEW HORSEPOWER FORMULA WITH TEST OF COLE MOTOR

URBANA, ILL.—Editor Motor Age—Why is it that when a motor car appears to be running perfectly and the driver stops the car—say for 5 minutes—then starts to crank the motor again, the flywheel will make a dozen quick revolutions and stop, and after repeating the operation half a dozen times the motor will run as though nothing had happened?

2—How is a 30-horsepower motor rating compared with the power of thirty horses? We know that a 30-horsepower car will stick in deep mud or on a steep hill when four horses can pull it easily. I understand what a standard horsepower is, but do not know what comparison there would be.

3—What is the proper way to distinguish a high-tension magneto from a low-tension or a low-tension from a high?

4—What is the proper way of distinguishing a D. C. magneto from an A. C.?—F. L. Cannon.

1—Probably due to a grain of sand or other foreign substance which temporarily stops up the needle valve.

2—The basis of horsepower computation is the theoretical number of pounds an average horse can lift 1 foot in 1 minute. Tests have found this amount to be 33,000 pounds, which is adopted as standard. A 30 horsepower motor is one that, if properly applied to a load, will exert a turning impulse equal to thirty times this standard. Whether or not this power can be efficiently applied to the load depends upon how it is transmitted to the tractive element, the hoofs of the horse or the wheels of the car. If imperfectly applied, the available power is limited by the efficiency of its transmission.

In your allusion to the car stalled in the mud, whose 30-horsepower engine is powerless to extricate it, but which is easily hauled out by four horses; it must be remembered that the motor is working at a great disadvantage, being helpless to exert its great power because of imperfect traction or frictional losses in transmission, or improper gearing. Four horses are in this instance able to do what a 30-horsepower motor cannot, simply because they are in a position to use their power, and the motor is not. Were designers able to devise a means of transmitting the torque of the motor to the actual motion of the vehicle as efficiently, flexibly and economically as the power of the horse is transmitted to his locomotion, cars with 30 horsepower would be practically invincible.

In comparing mechanical power to animal power, it must be borne in mind that the power of a horse is more flexible than any mechanical source of power ever can hope to be, and that while a horse in the long run is only 1 horsepower, for a short period he may exert an effort greatly in excess of this standard, while a motor, being less flexible, cannot appreciably increase its power in moments of great stress, but in the long run, it can maintain its average power for long periods, showing no fatigue. It is well known that the maximum power of a horse is only available for a comparatively short period, and while he can for a short while show a great advantage over a motor, he must give the palm to the motor when endurance is considered. A 30-horse-power motor does give that much power, and while a 1-horsepower horse may for a very short while develop power greatly in excess of his rating, he does so inevitably at the expense of endurance.

3—The difference between a high-tension and a low-tension magneto, is that the high-tension magneto is self-contained, producing a high-voltage current direct, whereas the low-tension magneto produces a low-voltage current, which must be passed through an induction coil before being fit for jump-spark igniting purposes. This was explained and illustrated in Motor Age for July 5.

4—An alternating current magneto is distinguished from a direct current in that the direct current magneto has a commutator, whereas the alternating current machine has not. Practically all magnetos used for motor car ignition are without commutators, producing an alternating current.

The Readers'

New Horsepower Formula—Rating Shown to Be Conservative—Theoretical and Actual Curves Similar—Direct and Alternating Current Magnetos Distinguished

Formula Given Test

Results Calculated from Modification of S. A. E. Rating Corresponds to Block

INDIANAPOLIS, IND.—Editor Motor Age—I was very much interested in the new horsepower rating formula proposed in the Mathematics of Motoring department of Motor Age for July 25, and particularly in the chart for finding the power developed by any size engine at different speeds. It looks to me as if such a formula would be much better than the S. A. E. rating, provided it gives results somewhere near the actual power developed by everyday engines. How close to brake results does your formula come?—C. F. H.

As a means of comparison, there has been plotted in Fig. 1 two curves, one the brake test of a motor in actual service and the other the horsepower at the different speeds as calculated from the modified S. A. E. formula proposed last week, and whose derivation is shown in the same department of this issue. The upper or curved line was plotted from the figures given by an actual brake test of a Cole four-cylinder motor with 4½ inches bore and 5¼ inches stroke. It was equipped with Bosch magneto and Schebler carbureter and the test was taken by Wheeler & Schebler, assisted by C. S. Crawford, chief engineer of the Cole Motor Car Co.

It will be noted that the results from this test give a curve instead of the straight line obtained from the formula, and average about 5 horsepower higher than the calculated power at the corresponding crankshaft speed. But at 1,600 revolutions per minute, the speed at which maximum power is obtained on the motor under test, the difference between actual and calculated power for this motor is less than 2 horsepower. The test showed 47.4 horsepower maximum, and the formula shows 45.5 horsepower at the same speed. The old S. A. E. formula rating gives the motor 32.4 horsepower, somewhat under the actual showing, it must be admitted. The slight difference between actual and calculated results in this case can be accounted for by the fact that the test was conducted under the very best conditions. The array of talent that was present in the persons of the engineers of the makers of the carbureter and motor, assured that both were in ideal adjustment.

Clearing House

Why Speed Does Not Increase Proportionately to Size—Small Motors Develop Great Velocity—Oil for Water-Cooled Engines—Viscosity Depends Upon Temperature

High Voiturette Power

Long Stroke and Great Compression Cause of Fine Showing of French Freaks

ATLANTA, GA.—Editor Motor Age—I am much interested in the experiments conducted by some of the French manufacturers in an endeavor to make small size motors develop exceedingly high horsepower. Can you explain to me how they are able to do this?

2—Why is it that a high-powered car is not as efficient, comparatively, as a smaller car? For instance, almost any stripped stock car can made 60 miles per hour, while a 90-horsepower bona-fide stock car hardly ever is able to do more than 80 or 85 miles per hour. Also, the Blitzen Benz with 200 horsepower as yet has done only 141 and a fraction.

3—Is the Chadwick Engineering Works of Pottstown, Pa., still making its type 19?—J. N. Brightwell.

1—Small motors are made to develop great horsepower by means of increased stroke, high compression, and excessive speed. The reason for this is that the increased stroke permits of a greater degree of expansion per given cylinder bore than a shorter stroke, thus utilizing a greater amount of the expansion of the ignited gases; on the same principle of a compound or multiple expansion steam engine, the difference being that the whole expansion takes place in one cylinder. High compression induces more rapid combustion, and as power depends to a great measure on the rapidity of combustion, a high-compression motor will naturally deliver increased power over a low-compression type. Increased speed means, up to certain limits, increased power, as it permits of greater actual expansive pressure per minute than at slower speeds. Time being one of the three factors of power. There practically is no limit to the degree to which power may be increased by these means, except the limit to the strength and endurance of metals, and the electrical lag in ignition.

2—The reason why high-powered stock cars are able to make less speed in proportion to their power than lower-powered cars is that their weight is usually excessive, and above certain speeds power becomes less and less a factor in the maintenance of speed. Other contributing influences are that the great weight that is unavoidable in high-powered cars is very destructive to tires, and hence the weight of a high-powered car is a means of compassing its own defeat. Large and heavy cars are also very hard to control under great speed, and are seldom run at their maximum rate of speed for this reason. A notable example of this is the late Walter Christie's front-drive car, which developed 240 horsepower, but owing to the fact that it became unmanageable at high speeds, it never was run as fast as it could have, had it been controllable. This car is at present being raced by Barney Oldfield, and if it could be controlled would probably be the fastest car ever built. Perhaps the most important reason for the fact that speed does not increase in proportion to power is to be found in the factor of wind resistance. Blitzen Benz, which you mention, in making approximately 142 miles per hour, required but 40 horsepower to overcome the road resistance, the balance of its 200 horsepower being consumed in overcoming air pressure, which was computed at approximately 80 per cent.

3—The Chadwick Engineering Works continues its model 19 for 1912.

VISCOSITY OF OILS

Union Grove, Wis.—Editor Motor Age—Which is the best oil to use in a water-cooled car, the following tests being claimed:

Fire. Degrees	Gravity. Degrees	Viscosity. Degrees
450	25	210
390	20.5	330
375	21.5	200
470	26	300

—O. P. Graham.

It is quite impossible to answer your question, as Motor Age does not know the temperature at which the gravity measurements were taken. This should be at 60 degrees Fahrenheit. As you have not given the temperature at which the viscosity of the four oils was taken, it is impossible to give anything definite. You know that viscosity drops very rapidly at high temperatures, and it is solely a question of the temperatures at which these readings were taken, and also the instruments used in the test. It generally is customary to take viscosity of distilled oils at 100 degrees Fahrenheit, and of cylinder stock at 210 degrees Fahrenheit. It is only when the temperature at which gravity and viscosity are taken, and whether the open or closed cup was used in the flash test, that it is possible to give anything accurate.

How to Overhaul Car

Owner Wants to Retime and Rehabiliate Buick—Loose Bearings Cause Knock

KALAMAZOO, MICH.—Editor Motor Age—I have a 1909 Buick, model 10, the engine of which I wish to take down and overhaul, as the compression is weak. I am sure there is considerable carbon deposit in the cylinders. How should I go about this, and how should I adjust the bearings, if they need it, for the engine is noisy?

2—What is the meaning of retiming and how should I do it?

3—Opening the throttle suddenly, or changing from low to high gear, there is a peculiar knock or rattle in the engine, no matter whether it is cold or not, or whether the spark is advanced or retarded. What is the reason?

4—The oil sight glass dome on the dash is, according to my understanding, supposed to show at least ¼-inch of oil when the engine is running. Even when I oil enough that the engine exhaust smokes, the oil bubbles a little. How would you account for this? I have cleaned out the tubes leading from the crankcase.

5—Why is it that with the throttle one-third open the car will do about 30 miles per hour, and after this point, no matter how far I open the throttle there is no material increase in speed?—A Reader.

1—To overhaul your motor proceed as follows: Remove the cylinders from the crankcase and scrape the cylinder walls and heads of the pistons well, washing with kerosene. Remove valves and cages and thoroughly clean and grind them. If they are badly worn it would be advisable to put in new valves and cages. Examine the wrist pins, and if considerably worn, renew the bushings. Take off the lower half of crankcase and see that both connecting rod bearings and main bearings are tight and in good condition.

2—There are two kinds of retiming, that

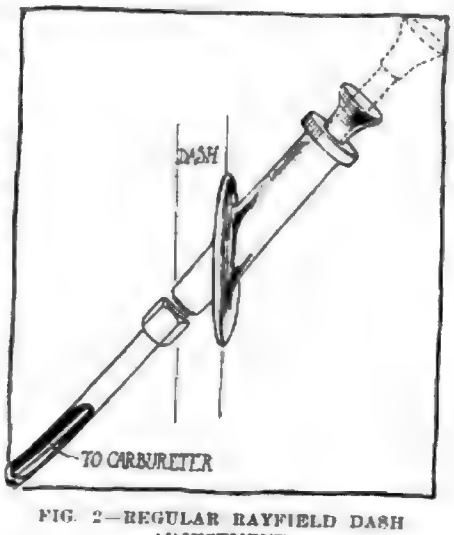


FIG. 2—REGULAR RAYFIELD DASH ADJUSTMENT

Adjustments of Rayfield D 4

Operation af Parts of Carbureter Explained and Illustrated—Mixture Regulation—Reversal of Current Polarity An Expensive Experiment

LANSING, Mich.—Editor Motor Age—Please explain:

1—The adjustments, air and gasoline, and principal operation of all of the parts of the Rayfield D4 carbureter, including the dash arrangement.

2—In wiring the storage battery the positive wire should be grounded. Would it result in short circuiting if the wires were reversed?—Nemo.

1—The principal working parts of the Rayfield carbureter as shown in Fig. 3, consist of the float and supply valve mechanism, which regulates the supply of fuel to maintain a constant level of gasoline in the float chamber B; the nozzle needle-valve V which operates in conjunction with the throttle T which also governs the movement of the mechanical air intake M; the automatic air valve A and the spray nozzle Z. In operation, the gasoline is fed through F to the supply needle-valve E, which is closed by the float lever, upon reaching the proper level in the float chamber B. The suction of the engine draws the fuel from this chamber through passages H, and it is sprayed out of nozzle Z the suction chamber, drawing in a blast of air from the set air port O, over the nozzle jet, and into the mixing chamber, from whence it is drawn through the throttle valve to the intake manifold, being governed as to volume by the position of the butterfly throttle as controlled by the operator. Simultaneously with the opening of the throttle, the needle valve V is raised higher from its seat in nozzle Z, admitting a greater volume of gasoline as the throttle is opened. The movement of the throttle furthermore controls the movement of the mechanical air inlet M, to which it is connected by a connecting rod, pivoted past center, so that M does not open until the throttle T is one-fourth open. This causes the proportion of air to gasoline to be greater as the throttle is opened, the mixture being thinned still more, as the throttle is opened and the suction of the engine increases, by the automatic opening of the auxiliary air valve A. This latter is mounted on two springs, a light one that permits a limited opening at low speeds and a heavy one for high speeds. The operation of this valve is governed solely by the suction of the motor and under heavy loads when the throttle is wide open, but with the speed of the motor slow, remains closed. The carbureter is water-jacketed to keep the mixture warm, thus facilitating rapid vaporization. At D is a small dam, for the purpose of permitting a pool of gasoline to form at the set air inlet when the carbureter is flooded, in starting. K in the exterior view is the throttle lever stem and cam. This cam operates the angle lever U, which raises or lowers the needle valve V, as the throttle is opened or closed. L is the dash adjustment crank which operated cam C, to raise or lower the needle valve, independent of the throttle position, for special circumstances, where the mixture is to be temporarily changed.

The adjustments of these parts are as follows: To determine the position of the needle valve in relation to that of the throttle, the dash adjustment is placed in the neutral position, which may be determined by observing that the cam C is out of contact with the low-speed screw LS. This screw is next unscrewed until arm U begins to leave contact with cam K. It should then be turned to the right, one and one-half turns. The automatic air valve is then adjusted by unscrewing its exterior adjustable seat ⅛-inch. The motor is then primed and started with the throttle set at about ¼ open. Upon starting it is slowed down to as slow as it will run, when the lowspeed lever is turned one notch at a time until the motor runs smoothly at low speed without a load. If the throttle does not close sufficient to permit slow speeds, the throttle stop on the reverse side of the carbureter may be unscrewed until it does. The low-speed adjustment being obtained, the motor is run until warm, when it is tested by pressing on the automatic air valve very gently with a pencil or like instrument. If the motor speeds up, the mixture is too rich, and should be thinned by turning the low-speed screw to the right until the motor begins to slow down.

The low-speed adjustment being right, the throttle is opened suddenly to see if the motor speeds up. If it is sluggish, or pops back into the carbureter, the high-speed adjusting screw, HS is turned to the right until this fault is remedied. If after having screwed this adjustment all the way up, the motor continues to pop back into the carbureter, the nozzle is too small, and should be substituted by a smaller one. If at intermediate speeds the motor back-fires, the adjustable air-valve seat should be turned to the right, thus increasing the spring tension, and decreasing the quantity of air at a given speed.

The dash control regularly included with the carbureter is of the pull-plunger type, and is connected and mounted as shown in Fig. 2. The bowden wire is connected to the dash control crank, and the tube to the bracket clamp, on the carbureter. The other style, which is shown in Fig. 5, is in the form of a kick-lever that may be applied to the foot board for operation with the foot, or to the dash for hand adjustment. Lost motion in the lever connections is obviated by the use of ball joints on the connecting rod. The dial is marked R on the right, designating the position for a rich mixture, and L on the left, designating a lean mixture. In the application of the first-named type, the dash control crank on the dash is set so that it is in neutral position when the pull-plunger is seated against the body of the attachment, in which position it should normally be left. The lever type is connected to the carbureter control in the same manner, but the latter is adjusted so that the normal position is with the dash control crank half turned, permitting dash adjustment in either direction; the dash lever being placed in the center of its quadrant for normal running. These controls are for the purpose of enriching the mixture for starting or heavy pull-for a hot motor, or for high-speed work, on a moment's notice.

ing; and with the adjustment recommended in connection with the kick-lever type, the mixture may be thinned further

2—Reversing the proper order of polarity in your battery wiring would not cause a short circuit, as the circuit would not be changed in any way except as to direction of flow, but such an experiment would probably result in burning out the coil.

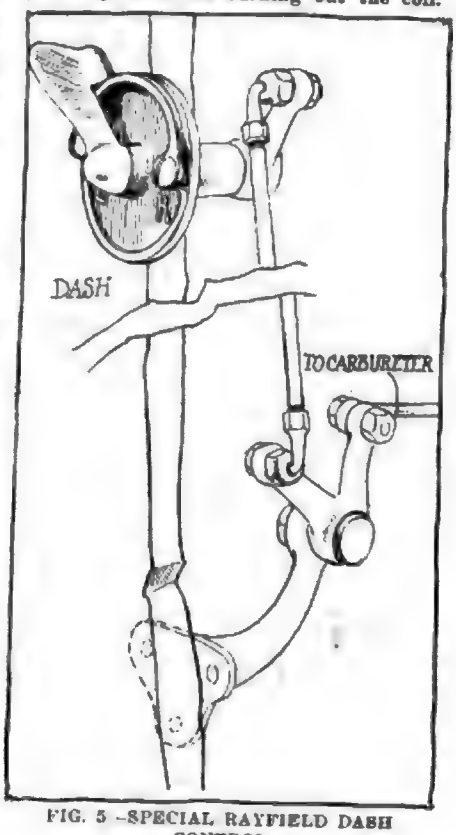


FIG. 5 —SPECIAL RAYFIELD DASH CONTROL

The Mathematics of Motoring

THAT the new formula proposed in this department last week for figuring the horsepower of gasoline engines of the four-cycle type where it is desired to take into consideration not only the bore and number of cylinders but the stroke and crankshaft speed as well, is a logical development of the standard S. A. E. or A. L. A. M. rating formula may be understood from the way in which the new formula is derived. As stated last week, the new formula, which may be called the modified S. A. E. formula, is

$$H.P. = \frac{D^2NSR}{15{,}000}$$

where D is the cylinder bore in inches, S is the stroke in inches, N is the number of cylinders, and R the crankshaft speed in revolutions per minute. Its basis is the standard S. A. E. formula, which is usually stated in the following way:

$$H.P. = \frac{D^2N}{2.5}$$

where D is the cylinder bore in inches and N is the number of cylinders, and is based on the assumption that the speed of the piston is 1,000 feet per minute in all cases.

As explained last week, though the old rating formula is correct for motors of such stroke and crankshaft speed that the piston speed is 1,000 feet per minute, it takes no account of differences in stroke or speed of revolution in motors of the same bore, which would affect the piston speed and therefore the power delivered; for, other things being equal, the greater the piston speed, the greater the delivered power—within limits.

Since the power developed varies as the piston speed, the power of a motor at a piston speed P will be to the power shown by the S. A. E. rating, as P is to 1,000, or

$$H.P. = (S.A.E.\ power) \times \frac{P}{1{,}000}$$

$$\text{but S. A. E. power} = \frac{D^2N}{2.5}$$

$$\text{So } H.P. = \frac{D^2N}{2.5} \times \frac{P}{1{,}000} \text{ or } \frac{D^2NP}{2{,}500}$$

The speed of the piston depends on two factors, the revolutions per minute and the stroke. The revolutions per minute to give a piston speed of 1,000 feet per minute varies inversely as the stroke; that is, in each revolution the piston travels twice the length of the stroke and the greater the stroke the lesser number of revolutions of the crankshaft per minute is required to give the standard piston speed. For instance, a motor with a stroke of 5 inches must turn over at 1,200 revolutions per minute to give 1,000 feet per minute piston speed, while a motor of 6 inches stroke need turn over at only 1,000 revolutions per minute to give the same piston speed.

New Horsepower Rating

Part 2

Modified S. A. E. Formula:

$$H.P. = \frac{D^2NSR}{15{,}000}$$

Where
- D = Bore in inches
- S = Stroke in inches
- R = Crankshaft revolutions per minute
- N = Number of cylinders

This is figured as follows, where S is the stroke in inches, R the revolutions per minute of the crankshaft and P the piston speed in feet per minute:

$$\frac{S}{12} = \text{stroke in feet;}$$

But the piston travels twice the length of its stroke in each revolution of the crankshaft; so

$$P = \frac{2S}{12} \times R = \frac{SP}{6}$$

$$\text{but } P = \frac{SR}{12}$$

substituting in above,

$$H.P. = \frac{D^2NSR}{2{,}500 \times 6} = \frac{D^2NSR}{15{,}000}$$

In a four-cylinder, 4½ by 5 motor, running at 1,400 revolutions per minute

$$H.P. = \frac{(4\tfrac{1}{2})^2 \times 4 \times 5 \times 1{,}400}{15{,}000} = 37.7$$

For four-cylinder motors the formula may be shortened by substituting 4 for N and

$$H.P. = \frac{D^2SR}{3{,}750};$$

And for six-cylinder motors the formula becomes in the same way,

$$H.P. = \frac{D^2SR}{2{,}500}$$

From the above it will be seen that the piston speed of a motor does not depend on the bore of its cylinders, but only upon the stroke and the crankshaft speed. Knowing the stroke, the piston speed can be figured for any number of crankshaft revolutions per minute, from the formula above for piston speed, $P = \frac{SR}{6}$.

In the table below are given the piston speeds in feet per minute of motors of different strokes in inches at various crankshaft speeds in feet per minute. When the speed of revolution of a motor of any given stroke is such that its piston speed as shown in the table is 1,000 feet per minute, its power rating according to the new formula is the same as that obtained by the old S. A. E. formula.

The new power formula may be used in terms of the piston displacement and crankshaft speed, if it is so desired. This is particularly handy in conjunction with the piston displacement table published in this department of Motor Age for May 2, 1912. By this method, the horsepower is found by multiplying the piston displacement by the revolutions per minute and dividing by 11,800. The formula may be stated:

$$H.P. = \frac{\text{Pist. Disp.} \times \text{R. P. M.}}{11{,}800}$$

For instance, in the example cited above, of a four-cylinder motor of 4½-inch bore and 5-inch stroke, at 1,400 revolutions per minute, the power would be found as follows:

From the table in the May 2 issue, we find the piston displacement of a motor of these dimensions to be 318.1 cubic inches. So,

$$H.P. = \frac{318.1 \times 1400}{11{,}800} = 37.7$$

PISTON SPEEDS IN FEET PER MINUTE FOR DIFFERENT STROKES AND R. P. M.

	Stroke in Inches												
RPM	3	3¼	3½	3¾	4	4¼	4½	4¾	5	5¼	5½	5¾	6
200	100	108	116	125	133	141	150	158	166	175	183	191	200
400	200	217	233	250	267	283	300	317	333	350	367	383	400
600	300	325	350	375	400	425	450	475	500	525	550	575	600
800	400	434	466	500	534	566	600	634	666	700	734	766	800
1000	500	542	583	625	676	708	750	792	834	875	917	958	1000
1200	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200
1400	700	766	816	875	934	992	1100	1108	1165	1225	1282	1342	1400
1600	800	868	932	1000	1068	1132	1200	1268	1332	1400	1468	153[illegible]	1600
1800	900	975	1050	1125	1200	1275	1350	1425	1500	1575	1650	1725	1800
2000	1000	1084	1168	1250	1352	1416	1500	1584	1668	1750	1852	1916	2000

the adjoining states and provinces.

The tractor contests resulted in the following awards:

Class B, gasoline engines whose cubic piston displacement is 300 cubic feet per minute and under—Case, gold medal, first; Goold, Shapley & Muir, silver medal, second; Avery, bronze medal, third.

Class C., gasoline engines whose piston displacement is 500 cubic feet per minute and over—Aultmann-Taylor, gold medal, first; International Harvester, silver medal, second; Holt caterpillar, bronze medal, third.

Class D., kerosene engines whose piston displacement is 500 cubic feet per minute and under—International Harvester, gold medal, first; Rumely, silver medal, second; Avery, bronze medal, third.

Class B., Kerosene engines whose piston displacement is over 500 cubic feet per minute—Rumely, gold medal, first; Aultmann-Taylor, silver medal, second; International Harvester, bronze medal, third.

Class F., steam engines 60 horsepower or under—Case, gold medal, first.

Class G., steam engines over 60 and under 100 horsepower—Case, gold medal, first.

Class H., steam engines 100 horsepower or over—Case, gold medal, first; Sawyer-Massey, silver medal, second.

Engine gang plow contest—Rumely, first; Avery Self-Lift, second.

The Rumely oil-pull engine, winner of the gold medal in class E, was awarded the Grand Champion certificate as being the engine to make the best showing on all points in the contest.

The rules and classifications as set forth in this contest are interesting, and were carried out as follows:

CLASSIFICATION.

Class 76—

a—Gasoline engines whose piston displacement is 300 cubic feet per minute and under.

b—Gasoline engines whose piston displacement is over 300 and under 500 cubic feet per minute.

c—Gasoline engines whose piston displacement is 500 cubic feet per minute and over.

d—Kerosene engines whose piston displacement is under 500 cubic feet per minute.

e—Kerosene engines whose piston displacement is 500 cubic feet per minute and over.

The piston displacement to be calculated on a basis of a piston speed of 700 feet per minute, and to be equal to a total piston area in square feet multiplied by 700.

Steam Engines.—Where A—piston area in square feet; P—boiler pressure and 450 is taken as a standard speed.

OFFICIAL RESULTS IN AGRICULTURAL MOTOR COMPETITION HELD IN

CLASS 76 SECTION	Entry Number	MAKER'S NAME	ECONOMY BRAKE TEST: H.P. Hours per Unit of Fuel	H.P. Hours per Unit of Water	Steadiness, Vibration, Condition	Total	MAXIMUM BRAKE TEST: H.P. Maximum / H.P. Economy	Evenness of Load	Condition of Engine	Total
Highest Possible No. of Points		Internal Comb.	45	15	30	190	35	20	10	65
		Steam	40	35	15	190	35	20	10	65
B. Gasoline	2	Canadian Heer	125.5	15	20.4	169.9	17	14	9	40
	3	Avery	124	7.2	23.6	154.8	25	18	10	53
	4	J. I. Case	128	14.2	23.9	166.1	14	18	10	42
	5	Goold, Shapley, Muir	105.7	15	18.3	138.9	15	17	10	42
	6	International Harvester Co.	132.8	6.8	18.8	158.4	23	15	9	47
C. Gasoline	7	Sawyer-Massey	97.8	14	26.4	138.2	23	18	10	51
	8	International Harvester Co.	134.1	6.1	19.5	159.7	18.5	19	10	47.5
	9	International Harvester Co.	123	6.6	21.5	151.1	23.5	17	10	50.5
	10	Goold, Shapley, Muir	withdrawn							
	11	Canadian Holt	108.8	15	25	148.3	20.5	17	9	46.5
	12	Aultman-Taylor	145	5.9	24.4	175.3	23	18	10	51
	13	J. I. Case	104.3	6.4	22.6	133.3	22.5	19	10	51.5
	15	Diamond Iron Works	88.7	14.5	25	128.2	18	17	10	45
D. Kerosene	1	Canadian Heer	114.2	14.2	20	148.4	17.5	14	9	40.5
	16	Rumely	92.1	7.3	20.3	119.7	29.5	19	10	58.5
	18	International Harvester Co.	124.6	6.1	21.3	152	18.5	19	10	47.5
	19	Avery	135.5	11.2	21	167.7	14	17	8	39
E. Kerosene	21	International Harvester Co.	131.4	6.5	23	160.9	21	19	10	50
	22	Aultman-Taylor	138	6.4	27.7	172.1	18.5	18	10	46.5
	23	Rumely	145	9.9	20.9	175.8	31	16	10	57
	24	J. I. Case	86.9	5.9	23.9	116.7	25.5	17	9	51.5
F. Steam	25	J. I. Case	100.3	29.6	13.5	143.9	33	15	10	58
G. Steam	26	J. I. Case	111.3	33.5	14.1	158.9	21	18	10	49
H. Steam	27	J. I. Case	140	15	7.45	167.45	27	18	10	55
	29	Sawyer-Massey	90.8	34.8	8.95	143.55	23	14	10	47

Cause of Penalties: No. 11 for withdrawing from brake test to adjust engine; No. 19 for company's dynamometer readings were being taken.

OFFICIAL RESULTS IN THE PLOWING TESTS OF THE AGRICULTURAL MOTOR COMPETITION

CLASS 76 SECTION	Entry Number	MAKER'S NAME	Number of Bottoms	Width of Plow, Inches	Maker of Plow	Miles Traveled (Not Including Turns)	Length of Furrow, Feet	No. of Times Across Field	Average Width of Plowed Land, Feet	Acres Plowed	Average Depth, Inches	Total Time Required, Minutes	Time Lost Due to Plows, Etc., Minutes	Time Lost Due to Engine, Minutes	Time Required Turning, Minutes
B—Gasoline	2	Canadian Heer	4	14	Crockshutt	6	3955	8	37.6	3.41	3.5	238.5	14.0	4.5	5.5
B—Gasoline	3	Avery	4-5	14	Avery	6	3955	8	42.9	3.90	3.5	186.0	5.5	0	6.0
B—Gasoline	4	J. I. Case	5	14	Case-Sattley	6	3955	8	47.0	4.27	3.5	188.2	0	0	8.0
B—Gasoline	5	Goold, Shapley, Muir	4	14	Cockshutt	6	3955	8	37.5	3.41	3.75	184.9	13.0	0	7.5
B—Gasoline	6	International Harvester Co.	5	14	Oliver	6	3955	8	46.4	4.21	3.5	181.0	4.0	0	8.5
C—Gasoline	7	Sawyer-Massey	5	14	Deere	6	3955	8	46.7	4.24	3.5	202.8	4.5	0	9.5
C—Gasoline	8	International Harvester Co.	9-10	14	P. & O.	6	3955	8	88.1	8.00	3.5	200.0	3.0	0	8.5
C—Gasoline	9	International Harvester Co.	8	14	Oliver	6	3955	8	75.8	6.79	3.5	185.4	5.2	0	
C—Gasoline	10	*Goold, Shapley, Muir													
C—Gasoline	11	Canadian Holt	7-8	14	Cockshutt	6	3955	8	67.6	6.14	3.25	177.0	0	0	8.0
C—Gasoline	12	Aultman-Taylor	9	14	Deere	6	3955	8	81.2	7.38	3.5	152.0	0	0	9.0
C—Gasoline	13	J. I. Case	10	14	Case-Sattley	6	3955	8	92.1	8.36	3.5	212.0	4.0	3.0	7.0
C—Gasoline	15	Diamond Iron Works	10	14	Deere	6	3955	8	90.9	8.25	3.5	211.5	1.5	2.0	9.5
D—Kerosene	1	*Canadian Heer													
D—Kerosene	16	Rumely	5	14	Rumely	6	3955	8	45.5	4.13	3.5	204.0	7.0	0.7	8.0
D—Kerosene	18	International Harvester Co.	4	14	P. & O.	6	3955	8	34.7	3.16	3.5	193.0	0	0	14.0
D—Kerosene	19	Avery	4	14	Avery	6	3955	8	37.3	3.39	3.5	184.0	2.5	2.2	6.8
E—Kerosene	21	International Harvester Co.	8	14	P. & O.	6	3955	8	73.6	6.68	3.61	184.0	4.0	0	7.6
E—Kerosene	22	Aultman-Taylor	7	14	Deere	6	3955	8	62.9	5.71	3.5	155.0	0	3	7.3
E—Kerosene	23	Rumely	8-9	14	Rumely	6	3955	8	77.4	7.03	3.6	217.7	8.4	0	17.6
E—Kerosene	24	J. I. Case	8	14	Case-Sattley	6	3955	8	76.7	6.96	3.5	206.0	3.0	0.5	13.4
F—Steam	25	J. I. Case	6	13	Case-Sattley	6	[illegible]	8	56.3	5.1[illegible]	3.4	179.9	7.7	8.6	7.4
G—Steam	26	J. I. Case	10	14	Case-Sattley	6	3955	8	93.3	8.47	3.5	171.0	2.2	0	7.0
H—Steam	27	J. I. Case	12	14	Deere	6	[illegible]	8	114.2	10.37	3.5	178.0	7.0	0	7.0
H—Steam	29	Sawyer-Massey	9	14	Case-Sattley	6	3955	8	89.4	8.12	3.5	186.3	7.5	3	15.8

*Withdrawn †Gasoline ‡Kerosene

$\frac{(f)\ Ax450xP}{500}$ = 60 or under. $\frac{(g)\ Ax450xP}{500}$ = over 60 and under 100 $\frac{(h)\ Ax450xP}{500}$ = 100 or over

Prizes in each class shall consist of:
First prize.....Gold medal
Second prize.....Silver medal
Third prize.....Bronze medal

In all classes where there is no competition a diploma of award only may be given, upon which will be set forth, together with the number of points scored, that it was the only entry in the class.

ENTRIES.

2—All entries must be made on or before June 1, 1912, and must be made on the official entry form, with all data filled in accurately and accompanied with an entry fee of $50 for each entry.

3—All entries must be accompanied by an affidavit that the information therein is true and that the engine in question is from their regular stock, but being built specially for competition. A blue print or photograph of blue print, of the boiler, with the approval stamp of the Alberta inspector thereon, must also accompany the entry.

4—Each entry shall be allotted an official number, which shall be displayed during the competition.

5—Any firm or individual shall not enter more than one engine in each class unless the engines be radically different in construction. Such difference being understood to apply to the power equipment and not to piston displacement.

6—If the same type of engine is entered in both gasoline and kerosene classes, the identical engine may be used and operated in both classes, provided no change is made of parts or equipment, but there shall be a separate fee for each such entry.

7—Should the judges find the entry data inaccurate in any particular, they may, at their discretion, rule the engine out of the contest. Competitors shall state at time of making entry the number of bottoms with width of furrow they purpose using in plowing test, so that ground may be surveyed in good time.

CONDITIONS.

8—The fuel shall be that furnished by the exhibition association at current prices at Winnipeg, approximately:
Gasoline, 19½c per gallon of 277 cubic feet.
Kerosene, 14½c per gallon of 277 cubic feet.
Soft coal, $8.50 per ton of 2,000 pounds.
Wood, $6 per cord.

9—Each competitor must have sufficient staff for the care and running of his own entry.

10—Two men only, except observers, will be

CONNECTION WITH CANADIAN INDUSTRIAL EXHIBITION, WINNPEG, JULY, 1912

PLOWING TEST								DESIGN AND CONSTRUCTION							
140	15	25	15	10	.....		10 215	15	10	5	30				
120	35	25	15	5	5		10 215	15	10	5	30				
Drawbar H.P. Hours per Unit of Fuel	Drawbar H.P. Hours per Unit of Water	Acres Plowed per Hour per Econ. Brake H.P.	Quality of Plowing	Distance Traveled Without Replenishing Fuel	Distance Traveled Without Replenishing Water	Condition of Engine	Total	Accessibility	Protection of Working Parts	Ease of Manipulation	Total	Points Penalized	Total Points	Rank	Entry No.
82.4	14.5	23.4	9	4.4	.....	10	143.7	10.5	6	4.25	20.75	.....	365.35	5	2
92.3	11.5	24.7	10	4.5	.....	10	153	8.25	6.25	4.25	18.75	.....	379.55	3	3
122	14.5	19.1	9.75	10	.....	10	185.35	6.75	6.75	4.75	18.25	.....	411.7	1	4
121.3	14.5	17.8	9.5	7.6	.....	10	180.7	12.75	6	4	22.75	.....	384.35	2	5
87.6	5	20.2	8.5	7.8	.....	10	138.9	11	6.75	4.25	22	.....	366.3	4	6
97.4	14.5	19.7	8.5	4.9	.....	10	155	8.75	6.75	4.5	20	.....	364.2	5	7
120.2	7.5	21.8	9.75	6.3	.....	10	175.55	11	5.75	4.25	21	.....	403.75	2	8
88	13.5	22.9	7.75	4.1	.....	10	146.25	9.5	7.25	4.75	21.5	.....	369.35	4	9
129.6	15	23	10.25	6.5	.....	10	194.55	11.25	5.25	3.75	20.25	29	380.6	3	10
140	8	25	9.25	6.9	.....	10	199.15	10.75	7	4.5	22.25	.....	417.7	1	11
95.2	7.5	21.8	10.25	8.2	.....	10	152.95	10.75	8.5	4.25	23.5	.....	361.25	6	12
90.4	15	22.9	9.25	3.9	.....	10	151.45	8.5	8.75	3.5	20.75	.....	345.4	7	13
withdrawn								10.5	6	4.25	20.75	.....			15
93.1	10	24.6	10.5	4.6	.....	10	152.8	11.5	7	4.5	23	.....			1
118.6	7.5	19.8	10.25	10	.....	10	176.15	10.5	7.25	4.75	22.5	.....	354	2	16
5.4	13	20.4	9	3.5	.....	10	126.5	8.25	6.25	4.25	18.75	15	326.25	3	18
103.5	11.5	22.8	10.5	4.2	.....	10	159.5	9.5	7.25	4.75	21.5	.....	391.9	3	21
122.2	7.2	20.8	7.5	6.9	.....	10	174.6	10.75	7	4.5	22.25	.....	415.45	2	22
149	12	20.4	11.25	9.8	.....	10	203.45	10.25	6.75	4.5	21.5	8	449.75	1	23
73.8	4.8	19.9	9	7.1	.....	10	126.6	10.75	8.5	4.25	23.5	.....	318.3	4	24
120	25	22.7	9.5	3.1	4.3	10	190.6	13.5	8	4	26.5	.....	389	1	25
110.7	29.6	17.1	8.5	3.5	4.5	10	203.1	13.5	8	4	26.5	.....	437.5	1	26
79.6	28.5	18	11	5	4.5	10	191.4	15	8	5	29	.....	412.85	1	27
				1.5	5	10	150.9	14	8	4	27	.....	364.15	2	29

representative talking to operator during the brake test; No. 23 for setting plows deeper when

HELD IN CONNECTION WITH CANADIAN INDUSTRIAL EXHIBITION, WINNIPEG, JULY, 1912

Actual Time Plowing, Minutes	Acres Plowed per Hour	Miles Traveled per Acre Plowed	Average Drawbar Pull, Pounds	Average Drawbar Horsepower	Fuel Used, Including Turns, Pounds	Drawbar Horsepower Hours per Unit of Fuel	Lbs. Fuel Used per Acre Plowed	Water Used, Pounds	Lbs. Water Used per Acre Plowed	Average Drawbar Pull for 14-in Plow	Drawbar Horsepower per Acre per Hour	Possible Miles Traveled Without Replenishing Fuel	Possible Miles Traveled Without Replenishing Water	Possible Acres Plowed Without Replenishing Fuel	Possible Acres Plowed Without Replenishing Water	Lbs. Water per Drawbar Horsepower Hour	Cost of Fuel per Acre Plowed, Cents	Entry Number	Drawbar Horsepower Hours
112.8	0.96	1.76	3010	13.56	70.5	0.682	29.67	4.5	1.12	752	14.09	14.10	91.6	8.0	16.1	.094	57.6	2	48.1
154.8	1.34	1.54	3135	13.22	65.5	0.765	16.79	91.5	23.46	630	12.85	14.56	13.9	9.5	30.0	1.82	46.8	3	50.1
163.2	1.41	1.41	4450	23.41	70.25	1.012	16.45	4.25	0.99	890	16.64	32.00	32.0	22.4	22.9	.660	45.8	4	71.1
100.1	1.26	1.76	2080	21.64	38.5	1.095	17.15	10.75	3.15	920	17.24	24.20	67.5	13.8	38.4	1.83	47.8	5	58.8
87.3	1.49	1.42	3610	20.12	79.5	0.729	18.88	202.75	71.90	722	13.70	25.7	20.0	17.9	14.0	5.25	52.6	6	57.7
187.7	1.34	1.41	4085	25.20	98.75	0.807	23.29	9.5	2.24	977	18.79	15.7	182.0	11.1	128.5	119	64.9	7	79.7
174.7	2.36	0.75	6669	34.10	167.0	0.606	13.38	420.0	52.56	684	13.31	20.2	16.5	27.0	22.0	3.04	27.3	8	106.6
	2.37	0.88	6430	35.91	141.0	0.729	20.76	87.75	12.92	804	15.13	13.7	61.8	14.9	76.5	85.4	37.8	9	102.7
180.0	2.18	0.98	6338	35.96	94.0	1.077	15.30	0	0	874	15.51	20.8	.....	21.3	.....	.....	.....	10	.....
144.0	3.08	0.87	7080	47.14	97.5	1.160	13.22	408.0	55.30	787	15.33	22.6	15.6	27.1	19.6	3.61	42.6	11	101.3
158.0	2.53	0.72	7190	37.29	155.75	0.789	18.63	488.5	58.43	770	14.72	26.2	13.0	36.6	18.0	3.97	36.8	12	113.1
188.2	2.49	0.73	7350	35.50	136.5	0.750	18.96	0	0	725	14.24	12.4	.....	17.0	.....	.....	31.9	13	123.0
179.1	1.32	1.45	4400	22.40	124.25	0.566	30.08	176.0	42.66	880	17.02	11.5	8.9	7.9	6.15	2.50	52.8	15	117.4
192.1	1.06	1.80	3450	18.48	76.5	0.722	23.21	223.5	70.72	865	15.45	25.2	12.7	13.6	8.66	4.05	55.2	16	70.3
	1.18	1.77	2900	16.12	73	0.429	31.85	50.0	14.74	725	13.67	8.8	25.5	5.1	14.4	1.08	44.4	18	55.1
124.1	2.62	0.90	6395	36.07	110.0	0.631	24.82	196.5	29.16	828	15.76	10.7	27.5	12.0	30.6	1.87	38.4	19	46.3
144.7	2.67	1.05	5716	37.88	171.5	0.743	21.34	374.5	65.58	817	16.00	17.5	17.3	16.6	16.5	4.10	47.4	21	105.4
201.9	2.29	0.85	6880	34.42	135.0	0.851	18.78	187.0	29.82	854	15.62	24.7	25.0	29.1	29.0	1.52	39.5	22	91.3
160.7	2.21	0.86	6550	33.22	129.25	0.464	32.87	630.0	88.56	829	15.03	18.0	16.1	20.8	11.8	5.91	35.7	23	109.9
95.4	1.97	1.17	5004	31.06	76.5	0.57	19.57	149.5	50.0	981.4	843	15.75	7.8	11	6.7	1.45	35.9	24	104.7
193.1	3.33	0.72	8240	47.29	306.5	0.76	15.56	97.58	67.80	806.1	865	17.72	8.8	18	12.4	2.7	62.45	25	80.9
164.1	3.47	0.78	7750	57.00	303.0	0.97	15.12	20.4	27.04	915.8	882	15.02	12.6	18	21.8	2.2	52.70	26	128.6
	2.97	0.74	7890	46.17	1263.5		20.4	155.0	7.70	881.5	760	15.72	37	20	100	2.7	62.28	27	155.8
																2.7	63.13	29	126.2

Current Motor Car Patents

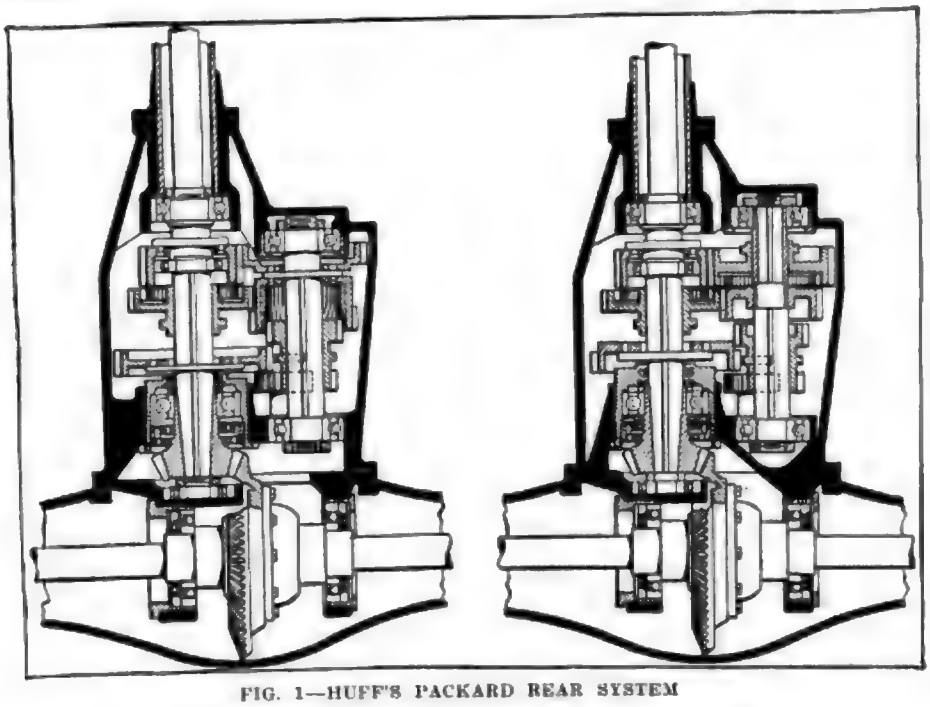


FIG. 1—HUFF'S PACKARD REAR SYSTEM

PATENTS ISSUED JULY 23, 1912

1,033,082—Speed Changing and Transmission Gearing. Dennis P. Collins, Pittsburgh, Pa. Filed December 29, 1910. Serial No. 599,966.

1,033,083—Speed Changing and Transmission Gearing. Dennis P. Collins, Pittsburgh, Pa. Filed April 1, 1911. Serial No. 618,478.

1,033,084—Speed Changing and Transmission Gearing. Dennis P. Collins, Pittsburgh, Pa., assignor to Collins Axle Mfg. Co., Pittsburgh, Pa. Filed May 31, 1911. Serial No. 630,495.

1,033,102—Transmission Gearing for Motor Vehicles. Russell Huff, Detroit, Mich., assignor, by mesne assignments, to Packard Motor Car Co., Detroit, Mich., a corporation of Michigan. Filed May 6, 1909. Serial No. 494,456.

1,033,130—Carbureter. Oliver P. Underwood and Raymond S. Hill, Des Moines, Iowa; said Underwood assignor to Herman C. Mills, Des Moines, Iowa. Filed August 29, 1910. Serial No. 579,489.

1,033,160—Explosive Engine. George F. Dillon, Kansas City, Mo. Filed July 8, 1911. Serial No. 637,469.

1,033,176—Transmission Gearing for Motor Vehicles. Russell Huff, Detroit, Mich., assignor, by mesne assignments, to Packard Motor Car Co., Detroit, Mich., a corporation of Michigan. Original application filed May 6, 1909. Serial No. 494,456. Divided and this application filed December 31, 1910. Serial No. 600,349.

1,033,185—Vehicle Wheel. James Warner McCallum, Plymouth, Ind. Filed April 24, 1909. Serial No. 491,894.

1,033,208—Rear Signal for Motor Cars. Ames B. Stites, Plainfield, N. J. Filed February 26, 1912. Serial No. 679,824.

1,033,211—Vehicle Wrench. John T. Sullivan, St. Louis, Mo. Filed October 2, 1911. Serial No. 652,244.

1,033,228—Dry Battery Cell. John W. Brown, Cleveland, Ohio, assignor to National Carbon Co., Cleveland, Ohio, a corporation of New Jersey. Filed September 14, 1906. Serial No. 334,603.

1,033,229—Tire for Vehicles. James P. Clare, Stratham, N. H. Filed February 17, 1911. Serial No. 609,139.

1,033,230—Process of Making Tires for Vehicles. James P. Clare, Stratham, N. H. Filed June 15, 1911. Serial No. 633,362.

1,033,253—Lantern for Vehicles. John George Aulsebrook Kitchen, Lancaster, and Isaac Henry Storey, Ambleside, England. Filed October 2, 1911. Serial No. 652,225.

1,033,292—Road Map. Victor Vallet, Paris, France. Filed June 22, 1911. Serial No. 634,818.

1,038,299—Spring Wheel. George J. Blazek and Charles Blazek, Red Lake, S. D. Filed March 15, 1911. Serial No. 614,610.

1,033,305—Signal for Motor Cars. Arthur B. Demuth, San Diego, Cal., assignor of one-half to George W. Stevens, San Diego, Cal. Filed June 26, 1911. Serial No. 635,303.

1,033,349—Elastic Suspension Means for Vehicle Bodies. Duncan Robinson, Boston, Mass. Filed July 26, 1909. Serial No. 509,533.

1,033,362—Locking Grease Cup or Lubricator. Thomas A. Walker, Evansville, Ind. Filed May 5, 1911. Serial No. 625,156.

1,033,417—Resilient Wheel. William H. Kern, Jersey City, N. J. Filed October 24, 1911. Serial No. 656,517.

1,033,425—Motor Car Fender and Co-operating Device. William A. Linquist, Minneapolis, Minn. Filed February 16, 1911. Serial No. 608,997.

PACKARD Gearset—No. 1,033,102. Russell Huff, Detroit, Mich., assignor to the Packard Motor Car Co., Detroit, Mich., Filed May 6, 1909, dated July 23, 1912. This transmission, like the regulation Packard type, is a unit with the rear axle housing or bridge. It is distinguished from the standard in the manner of engagement, the position of the shifter rings and the form of the gears. The high speed is of the usual direct-drive type, the countershaft gears running idle when it is in mesh. The type of clutch is unique, consisting of internal teeth on a sliding gear, which meshes with the extended teeth of the master gear on the drive shaft. This internally toothed gear is also provided with external teeth, and a shifter ring, engaging at its opposite position with the second-speed gear on the countershaft. This gear is in turn internally toothed, the teeth opening at a bevel to facilitate engagement. Engaging with these teeth is a sliding gear on the countershaft which engages respectively these inner teeth and the teeth of a large gear mounted on the driven shaft. It is shown in Fig. 1 at the left.

No. 1,033,176 covers the same device with a slight modification. The original application was filed May 6, 1909, divided and this application filed December 31, 1910, dated July 23, 1912. Similar to the foregoing, this gearset assembly consists of the usual Packard system as above, differing in the manner of operation, arrangement and design of the gear members. As illustrated in Fig. 1 at the right, the countershaft is driven by a pinion on the driveshaft, which engages with the third speed gear to obtain direct drive for the high speed. This third-speed gear is slid to its opposite extremity to mesh with the second-speed idler, which runs loosely on its shaft, being connected to the driven countershaft gear by internal teeth on the latter, which engage with its external teeth. Low speed and reverse are obtained by an additional idler gear, which in reverse telescopes within the second-speed idler.

Carbureter—No. 1,033,443—Charles A. Morris and Walter H. Merritt, Red Bank, N. J. Filed March 27, 1911, dated July 23, 1912. Unique in the use of the long-dis-

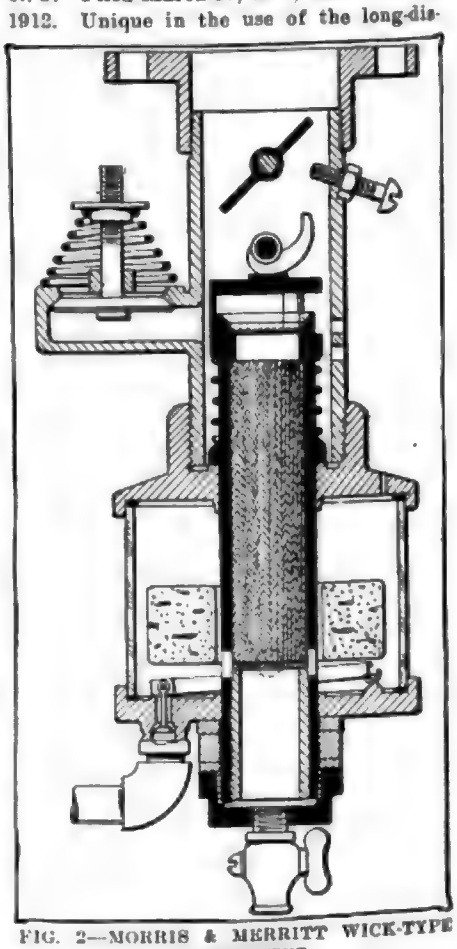


FIG. 2—MORRIS & MERRITT WICK-TYPE CARBURETER

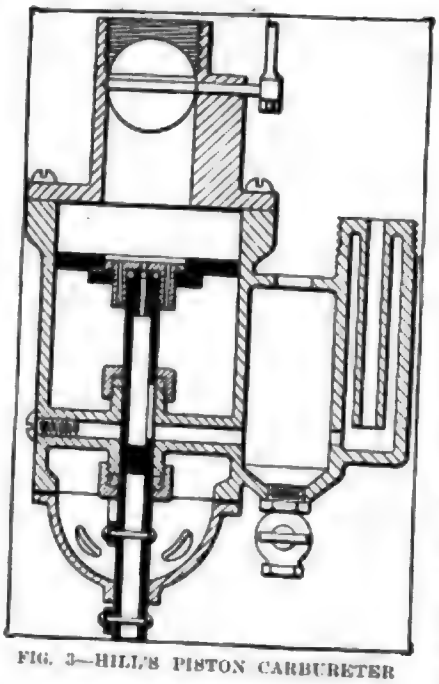


FIG. 3—HILL'S PISTON CARBURETER

carded wick vaporizer, this carbureter, Fig. 2, consists of a glass float chamber, with a cork float, and needle valve, a mixing chamber and air intake, provided with an auxiliary air valve of the usual type, with a conical spiral spring, and a vertical wick tube. This tube is open at its top, and provided with a drain cock at its bottom. The wick is disposed within this tube, and extends up into the mixing chamber, and down below the gasoline level in the float chamber. It is tubular in form, and provided with an interior tube, which exposes it at the top and bottom. Adapted to regulate the amount of air passing over the top of the wick, a valve, normally off its seat on the wick tube, is placed in the mixing chamber and is adjustable for enriching or thinning the mixture. The main air inlet is below the wick opening, about the wick tube, and the outlet is provided with the usual butterfly throttle, with a stop screw, placed obliquely in the body of the throat.

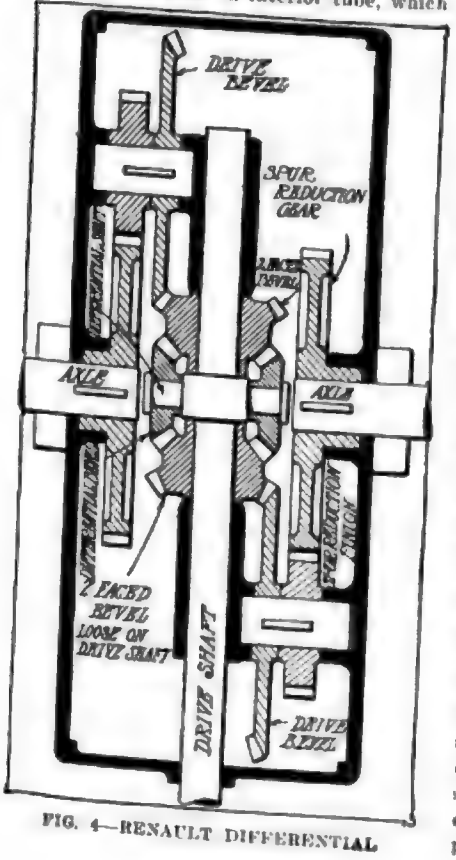


FIG. 4—RENAULT DIFFERENTIAL

Spark Plug—No. 1,033,449—James E. Murray, Brooklyn, N. Y., assignor to Arthur B. Mossler, New York, N. Y. Filed Feb. 23, 1907, dated July 23, 1912. This spark plug, Fig. 5, is of the double-circuit type, having two distinct sparking points in one body, and connected to two separate binding posts.

Transmission Gear—No. 1,033,618—Louis Renault, Billiancourt, France. Filed July 20, 1910, dated July 23, 1912. Embodying radical departures from the usual practice in such devices, the reducing differential gear, shown in Fig. 4, reverses the usual order of drive in its bevel-gear differential, and utilizes spur gears and pinions for its reducing mechanism. The drive consists of a propeller-shaft entering the housing of the device, and by means of the gearing, to differentially drive the divided halves of a live rear axle or jackshaft. Unlike most devices of this nature, the driveshaft is carried directly through the interval between the inner ends of the axle shafts, having a bearing at either side of this interval. Directly within this space are four small bevel pinions with shafts at right angles to each other and to the driveshaft, the inner ends of which are integral with an annular collar about the driveshaft, to which the latter is keyed.

These bevel pinions mesh with two double-faced bevel gears, which are rotatably mounted on the driveshaft, and which mesh, on their opposite faces with respective bevel gears, which are in turn, secured integrally to gear-pinions mounted on short shafts, transverse to the driveshaft, situated on either side of the driveshaft, and on opposite sides of the axleshafts. These small pinions mesh, in turn, with larger gears mounted on the squared ends of the axleshafts.

In normal running, the first mentioned bevel pinions act as clutches on the inner surfaces of the two-faced bevels, not turning on their axes, the reduction gears are therefore driven at equal speeds. In rounding a corner, the unequal resistance of the wheels causes the small bevel driving pinions to revolve, causing a differentiation between the speeds of the respective reducing gears, causing the wheels to revolve at unequal speeds, to allow for the difference in the arcs they describe in turning. The advantages of this arrangement are: That the differential portion of the device is run at driveshaft speed, and is subjected to only driveshaft torque, which owing to the reduction is only equal to that portion of the torque exerted on differentials turning at axle speed, as is the quotient of the axle speed to the driveshaft speed, to the axle torque; which in the case of a 3 to 1 gear is one-third. The reduction gears are straight-faced spur-gears, and hence adapted to stand greater strains than the usual bevels, and owing to their position, are more readily accessible than in standard design.

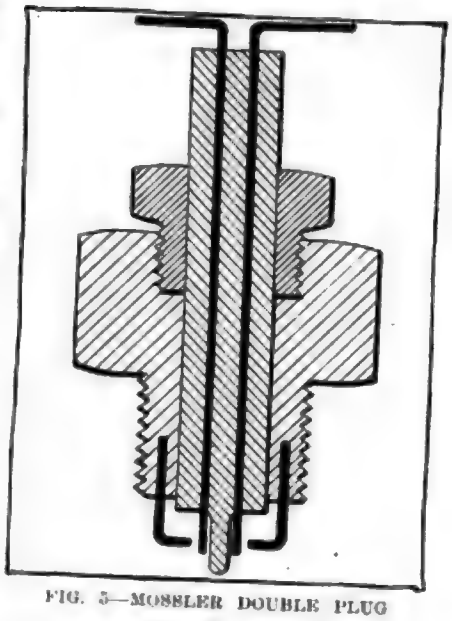


FIG. 5—MOSSLER DOUBLE PLUG

Carbureter—No. 1,033,130—Oliver P. Underwood and Raymond S. Hill, Des Moines, Ia.; said Underwood assignor to Herman C. Mills, Des Moines, Ia. Filed Aug. 29, 1910, dated July 23, 1912. Of the piston type, the carbureter shown in Fig. 3 is of the float-feed type, with a single non-adjustable nozzle. This nozzle is at the upper end of a vertical telescopic fuel tube, which communicates with a horizontal supply pipe leading from the float chamber, by means of a slot. Above the nozzle in the mixing chamber, is a floating disk, which is of the same size as the air chamber, and provided with a large central opening, for the passage of air, which is the same size as the throttle throat. This disk is free to rise or fall as drawn by the suction of the engine. Air is taken into the mixing chamber from below, and introduced into it through an annular air passage about the nozzle tube. Below the large piston disk, is a smaller disk, sliding upon the vertical nozzle tube, of sufficient diameter to close the central opening of the upper disk, when they are brought together, but allowing a passage of air about it, when apart. Connected to the central tube is a pivoted lever which is adapted to move it vertically. To this lever are connected links to each of the disks, adapted to separate or bring them together, according to the power of the engine suction. The object is to allow a greater or less volume of air to be admitted according to the suction of the engine, simultaneously varying the height of the spray nozzle to the volume of the mixing chamber.

Development Binds a Accuracy Fault

Measuring Equipment Has Been Developed to Insure Accuracy in the Production of Gears

New Things for the Motoring Public

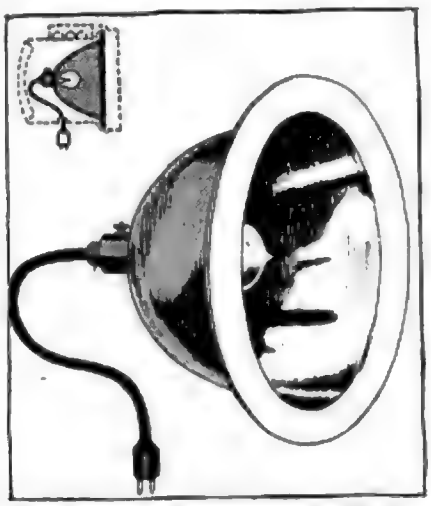


FIG. 4—CLEVELAND LAMP ADAPTERS

Electrifying Gas Lamps—New Device Lights, Puts Out and Controls Headlights

ated by handle H through bevel gears at G. The connection to the gas tank is by means of a square socket in the coupling at the end of the flexible shaft. The coil is wired to the battery by a single wire, another wire connecting the lamps in series, the last lamp being grounded to the car frame, as is the battery.

The lamps are lit by turning the handle H to the left which opens the gas valve by means of the shaft T, the cam C which is fixed to shaft S being brought against the plunger P, which, being raised by it, closes the contact inside of its case. The contact made, the trembler vibrates, and the high-tension circuit, jumping across the spark gaps on the lamp burners, ignites the gas being discharged by them. The handle then is turned to the right until the contact is released by cam C. The gas valve is closed for dimming or extinguishing by turning it to the right.

Adjustment is provided for cam C by means of the adjusting screw A, which permits the valve to be opened further before the contact is made, permitting a greater light, or allowing for a decrease in pressure, as the tank is exhausted. To change gas tanks, it is only necessary to loosen the small set screw on the flexible coupling, and slide the tank out. The lamps are equipped with hard rubber insulating blocks with binding posts. The ignition points are of hard-drawn copper, bent to grip the forked lava tips, and held in place by brass tension springs at the bottom of the lamps. This construction permits instant removal, and makes them immune to vibration, it is claimed by the maker.

Automatic Lock Switch

Equipped with a Yale pin-tumbler lock, the Blackburn automatic lock switch, consists of a two-point switch, the plug of which consists of a Yale key, which cannot be removed unless the switch is open and which cannot be picked, it is claimed. The switch itself cannot be removed unless the key is in the lock and turned to close one or other of the contacts, even though the four screws be removed. The lock switch is applicable to any ignition system, and when applied to the coil box the circuit cannot be faked. The appliance is neat in appearance, and has but one control, namely, the key. It is shown in Fig. 1.

Essenkay Tire Filler

Among the new tire fillers that in the past season have attracted so much attention, Essenkay is notable. This substance, like most compounds of its nature, is compounded by a secret formula from non-rubber ingredients. It is applied in the manner that seems to be most popular with tire fillers, i. e., in the form of a ready-moulded tube, composed of a cloth stocking into which the compound is injected, being applied to the tire in the same manner as the ordinary inner tube. It is of a light yellow color, and is claimed to be immune alike to the action of heat sufficient to melt lead, freezing in a block of ice, acids, and alkalis, with the exception of aqua regis, which happens to be the only combination of acids that is known to destroy gold.

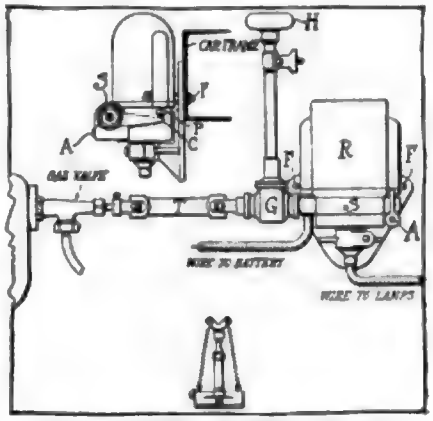


FIG. 5—PIERCE LIGHTER AND CONTROLLER

It is asserted that Essenkay will not change shape under sustained pressure.

Improved Shaler Vulcanizer

To make the maintenance of a uniform temperature certain, the Shaler vulcanizer has been equipped with an ingenious thermostatic damper that controls the temperature so that the steam pressure is kept automatically high enough to properly vulcanize the tire or tube, and yet prevents overheating and burning. The vulcanizer consists of an appropriately shaped body of cast iron which is clamped to the tire. Within the hollow interior, a metal tube is expanded to form a flue for the combustion of gas generated by a small wickless alcohol lamp.

Referring to the drawing, Fig. 2, E is the burner and D, the body of the device. C is a damper over the top of the flue which governs the amount of heat generated by the lamp. At A is attached the thermostatic element B, which consists of a spring, composed of strips of brass and steel riveted together, which flexes under the influence of varying temperatures, due to the uneven expansion of the two metals. Adjustment of the relation of C to B, is provided by a small screw at A, and as a check on inexperienced tamperings with this adjustment, a safety valve is provided at G.

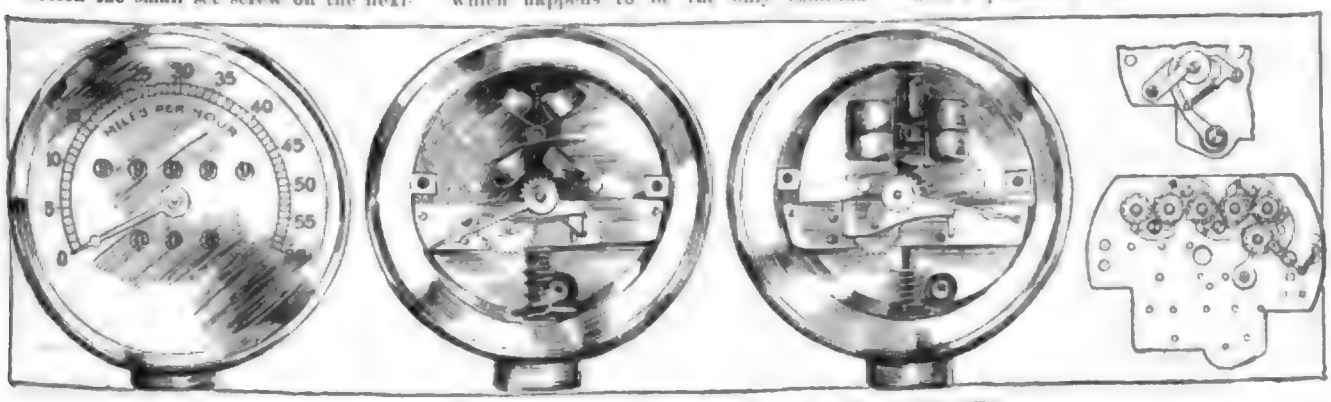


FIG. 6—BROWN SPEEDOMETER SHOWING OPERATION AND PARTS

Brief Business Announcements

Recent Agencies Appointed by Pleasure Car Manufacturers

Town—	Agent	Make
Atlanta, Ga	Atlanta Auto Sales Co	Henderson
Asheville, N. C	Asheville Auto Co	R. C. H.
Addison, Ill	Schram Brothers	R. C. H.
Akron, O	Akron Auto Garage Co	R. C. H.
Asbury, Park, N. J	Sofield Automobile Co	R. C. H.
Arlington Hgts., Mass.	A. H. Ward	R. C. H.
Belvidere, Ill	H. H. Collier	R. C. H.
Burlington, Ia	Hawkeye Motor Car Co	Hupp-Yeats
Chicago	J. B. Kelly	R. C. H.
Crandon, Wis	Fred J. Rogers	Henderson
Covert, Mich	Shattuck & Son	R. C. H.
Chicago	Schroeder and Son	R. C. H.
Collingdale, Pa	George H. Custer	R. C. H.
Devils Lake, N. D	C. L. Dobbs	R. C. H.
Delano, Minn	William Heinen	R. C. H.
Dunnellen, N. J	Service Motor Co	Henderson
Edwardsburg, Mich	Pearson & Pearson	R. C. H.
Elgin, Ill	Henry Muntz Co	R. C. H.
Fall River, Mass	F. W. Davis and Sons	Henderson
Glens Falls, N. Y	Glens Falls Automobile Co	E-M-F
Glens Falls, N. Y	Glens Falls Automobile Co	Rambler
Glens Falls, N. Y	Glens Falls Automobile Co	Flanders
Germantown, N. Y	A. W. Hover and Brothers	Franklin
Grundy Center, Ia	A. C. Schafer	Henderson
Jackson, N. C	Northampton Motor Co	R. C. H.
Kennebunk, Me	Don Chamberlin	R. C. H.
Long Beach, Cal	Hammond-Ballard Co	R. C. H.
Loramie, Wyo	James G. Klock	R. C. H.
Lodi, O	A. A. Sanford	R. C. H.
Los Angeles, Cal	J. W. Willcox Co	Henderson
Memphis, Tenn	V. L. Rogers, Jr	R. C. H.
Milledgeville, Ill	E. C. Miller	R. C. H.
Missoula, Mont	J. J. Deakin	Henderson
Monmouth, Ill	Weir Moore Motor Co	R. C. H.
New York	Henderson Eastern Motors Co	Henderson
Onancock, Va	R. E. Powell	R. C. H.
Pipestone, Minn	Bunn & Goembel	R. C. H.
Rochester, N. Y	Knipper-Kipp Co	Henderson
Statesville, N. C	R. H. Troutman	R. C. H.
St. James, Minn	J. J. Schutz	R. C. H.
Sanford, Me	Charles Lord	Peerless
Sanford, Me	Charles Lord	Stevens-Duryea
Sanford, Me	Charles Lord	Chalmers
Sanford, Me	Charles Lord	Paige-Detroit
Sanford, Me	Charles Lord	Pope-Hartford
Syracuse, N. Y	John Valentine Co	Paige-Detroit
San Benito, Tex	Whittlesey Gar. and Mach. Co	Henderson
St. Louis, Mo	Model Auto Sales Co	Henderson
Thompsontown, Pa	Harvey Hertzler	R. C. H.
Wapakoneta, O	McFarland and Thompson	Mercer
Waterloo, Ia	Black Hawk Auto Co	Henderson
York, Pa	Auto and Truck Sales Co	Henderson

NASHVILLE, TENN.—A distributing agency for the south is to be established in this city by the Michigan Buggy Co.

Baltimore, Md.—L. S. Nock, of Crisfield, has been named as representative for the Detroiter-Baltimore car in Somerset county.

Ludington, Mich.—The bicycle business and garage formerly owned by F. M. Hoglund at 233 Dowland street has been sold to Frank Seymour.

Seattle, Wash.—With the placing of the agency for the Garford car with the Waterhouse Trading Co., another important addition is made to the Seattle row.

New Haven, Conn.—Frank W. Rowley, of New Haven, Conn., who has just been granted patents on a new tire composed of steel springs, is forming a company there to manufacture them.

Detroit, Mich.—The King Motor Car Co. has appointed the Matheson Automobile Co., 170 Victoria avenue, Toronto, Canada, as its dealers to cover a large part of the province of Ontario and a section of the province of Quebec.

Peoria, Ill.—Having outgrown his present quarters, Charles L. Turner has leased from H. H. Moody a new building which will be completed by September 15. It will be 50 by 150 feet, located at 2004 Main street. Mr. Turner will confine himself to the garage business.

New Orleans, La.—Arrangements have been completed for the financing of a new self-starter company locally. The Thurber rotary self-starter, a recent invention by Edward J. Thurber and Jack Racklypt, of the Chalmers Motor Car Co. of Louisiana, will be handled by a company to be capitalized at $200,000. The plant which it is proposed to build probably will be located in Detroit.

Greenville, O.—The York Supply Co. has closed a contract for the Republic tire agency in three surrounding counties.

Detroit, Mich.—Hupp-Yeates electrics will have representation in the south, A. J. Carrier having been appointed southern wholesale representative.

Wapakoneta, O.—The agency for the Mercer line has been taken by Clarence J. McFarland and Boone Thompson. The territory covered by the two includes the entire state.

Buffalo, N. Y.—During the past week the additional $4,000 stock subscription was secured for the removal of the Niagara Gasoline Motor Co. from Buffalo to Dunkirk, N. Y., where a factory will be erected on Brigham road. The entire amount subscribed was $50,000.

Baltimore, Md.—Arrangements have been made whereby the Detroiter-Baltimore Co., handling the Detroiter car, will have a larger store. The company has completed negotiations with the Lozier Sales Co. to take over the property at North and Maryland avenues for its new offices and salesrooms. The Detroiter company has the agency for the Detroiter for Maryland, Virginia and West Virginia.

Fall River, Mass.—Frederick W. Davis, who has been the teller and general bookkeeper of the First National Bank of Fall River, has formed a company comprising himself and his two sons, Harold C. Davis and Frederick L. Davis, called Frederick W. Davis & Co., to handle the Henderson car in the lower section of Massachusetts. Arrangements have been made to build a service station and salesrooms at 47 French street. Mr. Davis will still continue his connection with the bank.

Washington, D. C.—The Essenkay Sales Co. has opened a salesroom at 814 Seventeenth street, N. W., with W. G. Fairbank as manager.

Tiffin, O.—E. C. Hanes has severed his connection with the Tiffin Auto and Taxi Co. C. H. Lines and E. J. Rosenberger have entire control of the concern.

Chippewa Falls, Wis.—T. H. Field, Rice Lake, Wis., district agent in a large territory for the Overland, is contemplating the establishment of a branch at Chippewa Falls.

Detroit, Mich.—W. F. Schmeltz, formerly with the Detroit Steel Products Co., has been made special sales representative for the Poss Motor Car Co. with territory in Kentucky, Indiana and Ohio.

Baltimore, Md.—The Taxi Cab Co. of Baltimore has moved into its new spacious quarters on Cathedral street near Chase. The company was formerly located on Howard street near Franklin, right in the theater district.

Vancouver, B. C.—A $2,000,000 fire on July 20 destroyed among other big concerns the garage of the A. B. C. Motor Co., which estimates the loss on cars at $225,000. Between fifty and sixty cars, most of which were owned by commercial firms, were destroyed.

Sheboygan, Wis.—The Sheboygan Auto and Supply Co. has been incorporated at Sheboygan, Wis., with an authorized capital of $15,000. The incorporators are Charles F. Kade, Sr., Robert H. Thieman, Charles F. Kade, Jr., and Mrs. Caroline Thieman. The company has purchased the Maurer garage on Niagara avenue and will erect two additional stories, with

a 50 by 50 foot addition in the rear. Agency lines have not been closed.

Schenectady, N. Y.—The Union garage, Union and Barrett streets, was sold last week by Tefft & Miller to Fred Helms.

St. Louis, Mo.—The Paine Automobile Co. has taken on the Crow-Elkhart line manufactured in Elkhart, Ind., in connection with the Haynes and Lion.

Sacramento, Cal.—Don Lee, California distributor of the Cadillac line, has recently opened a branch in Sacramento. E. G. Anderson will be resident manager.

Syracuse, N. Y.—H. R. Jennings, formerly with the B. F. Goodrich Co., Akron, O., has opened a vulcanizing and tire repairing shop at 304 Merriman avenue, this city.

Plymouth, Ind.—The Methodist church at Plymouth has been sold to Oliver H., James W. and John W. Lawrence, who will commence work at once to remodel the church building into a garage.

Columbus, O.—The Broad-Oak Automobile Co., of 622 East Broad street, will move its repair department from the first to the second floor in order to give additional space for live storage. The company recently changed hands.

Baltimore, Md.—A change has been made in the local agency of the Everitt car and Board truck. These vehicles are being handled in this territory by the Square Deal Motor Co., W. K. Shelley, general manager. The company is located at 413-415 West Fayetter street.

Washington, D. C.—The Empire Automobile Repair Co. has been formed by Detlow Marthinson and J. Perry Kinyoun, with a salesroom and shop at 1521 Fourteenth street, N. W. The company has secured the Federal truck agency and is negotiating for a pleasure car agency.

Boston, Mass.—J. S. Harrington & Co., agents in Boston, Providence and Worcester for the Everitt, has added C. M. Dow and Patrick Gleason to the sales force, the latter to travel through New England with Wallace Hood, who went to Boston from the Everitt factory recently.

New Britain, Conn.—P. and F. Corbin are now moving the machinery for their door-check department into the building formerly used to manufacture the Corbin motor cars at New Britain. The space thus vacated at the main plant will allow the manufacture of the company's other lines.

Washington, D. C.—The Bowles Motor Car Co., agent for the Warren-Detroit, has made application to the court to change its name to the Warren Motor Sales Co. The company is to be reorganized and in future will be in part a factory branch of the Warren Motor Car Co., of Detroit. Charles Kloppmeyer will be the general manager. The salesroom at 1610 Fourteenth street, N. W., adjoining the company's present quarters at 1608 Fourteenth street, has been leased and will be merged with the main salesroom.

Syracuse, N. Y.—The T. A. Young Co., which has had the agency for the R. C. H., Peerless and Marmon cars, has gone out of business.

Baltimore, Md.—The agency for the Rapid truck in Maryland, Virginia and West Virginia has been discontinued by the Auto Outing Co. of Baltimore.

Columbus, O.—The Columbus branch of the Goodyear Tire and Rubber Co., Ross A. White, manager, which is located at 54 North Fourth street, will move about August 15 to a new building at 87 North Fourth street.

Philadelphia, Pa.—Fred Browning, having for 9 years been associated with the Autocar Co. of Ardmore and more recently the guiding genius of the Continental Motor Car Co., handling the Speedwell line of pleasure cars and trucks, has joined the sales force of the White Co. as manager of the truck department.

Beloit, Wis.—James W. Menhall, state agent for the Brush and Courier and local representative of U. S. M. Co. products, will retire from business locally on August 1 to become traveling representative of the United States Motor Co. in Wisconsin. The garage and agency business will be conducted by G. F. Beedle and Drs. P. A. Fox and C. E. Smith.

Syracuse, N. Y.—The Jefferson Garage Co., Inc., has secured the Freeman block in East Jefferson street, recently damaged by fire, and will remodel it for use as a garage. The members of the company are Antonio Matzene, Charles J. Roehm and Charles J. Baumer, all of Syracuse, and the capital is $30,000. Alterations will cost $10,000, and the building is promised complete for its new uses by September 1.

Los Angeles, Cal.—The Los Angeles agency of the Stevens-Duryea has passed from the Eastern Motor Car Co. to the recently incorporated English Motor Car Co., of which P. A. English is president and Clarence A. English secretary and general manager. Temporary quarters have been secured at 1036 South Grand avenue.

Indianapolis, Ind.—The Cole Motor Car Co. has appointed C. J. Corkhill assistant sales manager with headquarters at Omaha, Neb. He will have charge of a territory bounded by the Mississippi river on the east, the Gulf of Mexico on the south, the Rockies on the west and Canada on the north. He will have the same supervision as the general sales manager of the Cole Motor Car Co. in his territory. J. R. Moler is to hold a similar position in the territory west of the Rockies, up and down the coast. Mr. Moler will make his headquarters with the large Cole distributors, but will do continual traveling among Cole agents. J. R. Hamilton will be associated with Mr. Moler as the west coast Cole service expert. W. B. Lacor is a second Cole service expert added.

St. Louis, Mo.—The Prest-O-Lite Co. has opened up a service station at Channing and Locust streets, in connection with its branch.

Minneapolis, Minn.—The Pence Automobile Co., Minneapolis and St. Paul, has been appointed agent in Minnesota, the Dakotas and Montana for the Timken roller bearings.

Martinsburg, W. Va.—The Norwalk Motor Car Co. announces the Matheson Automobile Co., of Toronto, Ont., as its distributor for the dominion, with headquarters at Toronto.

South Bend, Ind.—J. H. Hansen, of the J. H. Hansen Co., local dealer, has been appointed general agent for the R. C. H. Corporation for the states of Iowa, Kansas and Nebraska and will go to Omaha, Neb., on August 1 to assume his new managerial duties.

Detroit, Mich.—Articles of association have been filed in this city by the Mote Demountable and Detachable Rim Co. with a capital stock of $30,000. The paid-in capital is $3,000. The term is 30 years and the stockholders are Herman Mote, H. L. Bock and W. M. Elliott.

Baltimore, Md.—The Colonial Motor Co. is having a garage built on the Ingram lot at North avenue and Lovegrove alley. The garage will be two stories high, of ornamental concrete and brick and will be 94 feet front on North avenue and have a depth of 303 feet and will be fireproof.

Winnipeg—A. R. Bredin, G. E. Webb, J. M. Nichols, Edward Spice and J. R. Crawford have been incorporated under the name of the Peerless Punctureless Tire Co., Ltd., for the purpose of dealing in and handling tires. The company is capitalized at $50,000, with head offices at Winnipeg.

San Francisco, Cal.—F. T. Burke has joined the Kelly Motor Truck Co.'s western department, with headquarters San Francisco. Mr. Burke will give his attention to the development of the service department which is to look after the entire Pacific coast territory, which includes nine states and the Hawaiian Islands.

St. Louis, Mo.—The Hudson-Phillips Automobile Co. has been formed in St. Louis and has taken on the Hudson agency formerly handled by the Phillips Automobile Co., which went out of business after a disastrous fire a month ago. The Hudson-Phillips company has taken quarters at 5803 Delmar avenue.

Detroit, Mich.—Harry Postal and Richard Fair have formed a new concern to be known as the Postal-Fair Motor Co., which has succeeded the Lion Motor Sales Co. The new organization has been made a sales branch of the Michigan Buggy Co., of Kalamazoo, maker of the Michigan cars, and in addition to marketing these cars, the Lion and Peerless machines, which

were handled by the Lion Motor Sales Co., will be carried.

Minneapolis, Minn.—The Moore Carving Machine Co., agent for the Elmore, denies that R. G. Ragen has been appointed its sales manager.

Grand Rapids, Mich.—F. G. Withrow and G. E. Finch, of Akron, O., have opened a shop at 15 Library avenue for the repairing of tires. They have secured the agency for the Republic tire.

New York—Charles E. Riess, of New York city, president of the American-Marion Sales Co., 1896 Broadway, has just closed 1913 contracts with the American Motors Co. and Marion Motor Car Co. for the New York district.

Kaukauna, Wis.—T. W. McFarlane has organized the Kaukauna Motor Sales Co. and established a garage and agency on Second street. The concern will distribute the Marathon in a large northeastern Wisconsin territory.

Olean, N. Y.—The machine shops and foundry of the Clark Brothers new manufacturing plant at Olean will be of steel and concrete construction. Plans for the new building have just been completed. The two new structures will be 100 by 300 feet. The Clark Brothers foundry at Belmont, N. Y., was recently burned.

Boston, Mass.—Christopher F. Whitney and Charles H. Barney have sold out their interest in the Whitney-Barney company to Frank B. Wilcox. The latter and Fred P. Lucas probably will carry on the business. The firm handled the Selden and Chadwick in Boston. Mr. Whitney intends to enter the real estate business and Mr. Barney will continue as a mining broker.

Boston, Mass.—Edgar A. Ordway has been added to the sales force of the G. E. and H. J. Habich, Boston distributor of the Cole.

Columbus, O.—The Columbus Auto Brass Co., which has been operating a plant for the manufacture of supplies and accessories at 175 West Maple street, is erecting a new factory at the corner of Fourth and Warren streets.

Tacoma, Wash.—The latest firm to join Tacoma row is the Union Motor Car Co. at 717 South C street. R. A. McCormick is president and N. L. McCormick, his brother, will be associated with him, while George A. Stewart will assume the managership. The new concern will handle Pope-Hartford, Peerless, Chalmers and Buick.

Indianapolis, Ind.—H. C. McVey has been appointed Indiana representative for the Little cars, manufactured by the Republic Motor Car Co. He has opened headquarters and an Indianapolis salesroom at 338 North Delaware street, this city. Mr. McVey until recently has been city sales manager of the Indianapolis sales branch of the Buick Motor Co.

Baltimore, Md.—The local branch of the Stoddard-Dayton Automobile Co. will be discontinued. H. S. Block, who has had charge of this branch, will continue the Stoddard-Dayton company as an agency, having made arrangements to purchase the same from the United States Motor Co. He will select a new location. The present location has been taken over by the local branch of the Locomobile Co. of America, T. W. Wilson, Jr., manager.

St. Louis, Mo.—The United States Rubber Co., St. Louis branch, has moved into its new quarters at Compton avenue and Locust street.

Syracuse, N. Y.—F. B. Lounsberry, a graduate of the University of Michigan, was recently appointed assistant metallurgist of the H. H. Franklin Mfg. Co.

Albany, N. Y.—The C. F. Weeber Mfg. Works has discontinued the agency for Ford cars and has substituted the Studebaker agency. This company also handles the Haynes.

Milwaukee, Wis.—Walter O. Ladewig will erect a $10,000 garage and repair shop at 1459-1461 Green Bay avenue. It will be of reinforced concrete construction, 32 by 98 feet in size.

Buffalo, N. Y.—The Lumen Bearing Co., which concern recently secured membership in the Automobile Trade Credit Association, has begun the construction at Sycamore street and Belt Line, Buffalo, of a two-story machine shop to be operated in connection with its already mammoth plant. The present plant contains 70,000 feet of floor space.

Syracuse, N. Y.—John H. Valentine, head of the company bearing his name and which has had the agency for Chalmers cars, has retired from the concern and become connected with a Rochester company interested in the manufacture of motor trucks. Charles G. Hanna, inventor of the Hanna self-starter, is now at the head of the Valentine company. The Paige-Detroit agency has been added.

Recent Incorporations

Akron, O.—Akron Airless Tire Co., capital stock, $50,000; to manufacture and sell tires and rubber goods; W. S. Brooks, J. J. Surbey, I. N. Thompson, F. H. Beyea, H. L. Cole.

Akron, O.—Majestic Rubber Co., capital stock, $3,000; to manufacture rubber goods; incorporators, E. Christian, O. W. Baum, J. A. Myers, A. L. Neiswanger, J. H. Ault.

Alexandria, Md.—Check Spring Motor Co., capital stock, $100,000; incorporators, C. E. Hooper, C. L. Lamber, A. S. Check.

Brooklyn, N. Y.—E. Reinekling Automobile Supply Co., capital stock, $5,000; incorporators, E. Reinekling, J. Lucht, B. F. Nienstedt.

Camden, N. J.—Lewis Grease-Cup Co., capital stock, $100,000; incorporators, J. A. Lewis, W. L. Ford, M. G. Ryan.

Canton, O.—Central Motor Car Co., capital stock, $25,000; general motor car business, incorporators, R. F. Wilson, D. L. Tschantz, D. B. Wilson, M. Tschantz, E. Wilson, A. Herr.

Cincinnati, O.—Welbon Motor Car Co., capital stock, $25,000; to manufacture motor cars; incorporators, W. E. Welbon, H. S. Levman, C. D. Wilson, C. W. Shepler, H. A. Welbon.

Cincinnati, O.—Cincinnati Motor Car Co., capital stock, $10,000; to manufacture motor cars; incorporators, C. D. Wilson, H. C. Helsey, M. C. W. Shepler, J. O. Miller, R. M. Comer.

Cleveland, O.—Arter Auto Carriage Co., capital stock, $20,000; to sell and repair motor cars and trucks, operate garage, and deal in parts and accessories; incorporators, J. G. Arter, B. Hexter, J. B. Ruhl, C. A. Chapman, C. M. Lemmon.

Dayton, O.—Walter and Moosburgger Co., capital stock $10,000; to operate motor car livery; incorporators, L. F. Walter, W. H. Moosburgger, W. C. McConnaughey, J. J. Lynch, J. C. Shea.

Dayton, O.—Stocker Rubber Co., capital stock, $10,000; to deal in motor car tires and accessories; incorporators, A. D. Stocker, I. J. Cooper, H. H. Brewer, F. W. Johnson, J. W. Brumbaugh.

East Palestine, O.—East Palestine Rubber Co., capital stock, $50,000; to manufacture rubber goods; incorporators, E. E. Jones, C. Winter, C. A. Oatsdean, J. Hick, O. L. Shumate, A. S. Mauk, A. Hartley.

Esopus, N. Y.—L. M. S. Motor Co., capital stock, $10,000; to manufacture motors, etc.; incorporators, H. Cohen, E. Adler, J. J. Barker, W. C. Foster, J. J. Miller.

Gardner, Mass.—Brown-Rawson Garage Co., capital stock, $5,000; incorporators, S. J. Rawson, H. W. Brown, M. L. Rawson, C. Brown.

Jersey City, N. J.—Thomas G. Woolverton, Inc., capital stock, $10,000; general motor car business; incorporator, F. R. Hansell.

Memphis, Tenn.—Southwestern Motor Car Distributing Co., capital stock, $50,000; incorporators, J. W. Bondurant, N. S. Bruce, T. B. Crenshaw, P. H. Phelan, Jr.

New York—Standard Automobile Co., capital stock, $10,000; incorporators, E. H. Fritchman, H. D. Chapin, J. L. Janover.

New York—Automobile Importers' Alliance, Inc., capital stock, $750,000; incorporators, G. J. Ginsburg, L. H. Wymer, B. C. Wymer, H. W. Showers.

New York—William Strathmann, Inc., capital stock, $5,000; to manufacture and deal in motors; incorporators, W. Strathmann, H. C. Birkemeyer, J. H. Semken.

New York—Autodrome Co., capital stock, $50,000; to conduct racing exhibitions and deal in motor cars; incorporators, H. L. Curran, C. D. Curran, B. B. Jones.

Newark, N. J.—Warwick Motor Co., capital stock, $125,000; incorporators, J. D. Nicol, E. O. Woodruff, M. E. Hidden.

Newark, N. J.—W. S. Motor Truck Co., capital stock, $300,000; to manufacture motor trucks; incorporators, J. M. Woods, C. H. Tebbetts, L. T. Fetzer.

New Brunswick, N. J.—Consolidated Auto Supply Stores, capital stock, $1,000,000; incorporators, B. F. Hardesty, A. W. Dennen, B. A. Ross.

Oswego, N. Y.—Oswego Essenkay Co., capital stock, $1,500; incorporators, A. P. Murdoch, A. V. Radcliffe, C. C. Place.

Paterson, N. J.—Watson Electric Co., capital stock, $50,000; to manufacture electric motors; incorporators, C. P. Watson, A. B. Watson, J. L. Griggs.

Philadelphia, Pa.—Consolidated Auto Supply Co., capital stock, $1,000,000; to deal in motor car supplies; incorporators, B. F. Hardesty, A. W. Dennen, B. A. Ross.

Philadelphia, Pa.—Jackson Petroleum Motor Co., capital stock, $500,000; to manufacture engines and motors; incorporator, G. B. Jackson.

Pittsburg, Pa.—Pullman Auto Co., capital stock, $50,000.

Plymouth, Mass.—Plymouth Garage and Machine Shop Co., capital stock, $10,000; directors, A. J. Smith, R. E. Kingan, A. Smith.

Salem, Mass.—Motor Sales and Service Co., capital stock, $25,000; general motor car business; incorporators, G. B. Mason, E. B. Adams, G. B. Kinsman.

Salem, Mass.—Motor Sales and Service Co., capital stock, $25,000; incorporators, G. B. Nason, E. S. Adams, G. P. Kinsman.

St. Louis, Mo.—Model Auto and Sales Co., general motor car business; capital stock, $3,000; incorporators, O. Sontag, R. E. Stults, O. F. Karbe.

St. Louis, Mo.—Burns-Ramsden Motor Car Co., capital stock, $10,000; incorporators, L. N. Burns, J. H. Ramsden, C. C. Barker and others.

Walkerville, Ont.—Sparks-Withington Co., capital stock, $40,000; to manufacture motor cars; directors, W. Sparks, P. H. Withington, J. H. Coburn.

Wilmington, Del.—Ceylon Tire Filler Co., capital stock, $5,000; to manufacture and deal in tire filler.

Wilmington, Del.—Standard Auto Coach Burial Co., capital stock, $500,000; incorporators, I. Neuberger, F. H. Cöthren, S. Lowenstein, W. Litzenberg, C. H. Tebbetts.

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MOTOR AGE

VOLUME XXII
CHICAGO, AUGUST 8, 1912
NUMBER

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(a self-seller) *$3,250!*

A completely equipped Light Six which will meet the big demand for a really high-class car of this type

Dealers from coast to coast who have investigated the Lozier "Self-Seller" say it is the greatest motor car value they have ever seen.

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Some live dealer in your city will sell this car. How about you?

Write or wire for our proposition

A car worthy of the name

LOZIER MOTOR COMPANY Box 719 **DETROIT**

One Rub

Turns Brass to Silver

Talk about your nickel-plated lamps! In a few minutes you can *silver* plate every piece of brass and copper on your car. It is *actually easier than polishing* the brass. It does away with all polishing hereafter. All you need is a piece of cheesecloth and a bottle of

Trade **Silver Quick** *Mark*

One Rub
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$1.00 bottle will silver plate your whole car

Right now stick a dollar bill and your card in an envelope and mail to us for a bottle of SILVER QUICK. Silver plate every piece of bothersome brass on your car. Get away from that cheap, brassy look. Make your car as up-to-date as any 1913 model.

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MOTOR AGE

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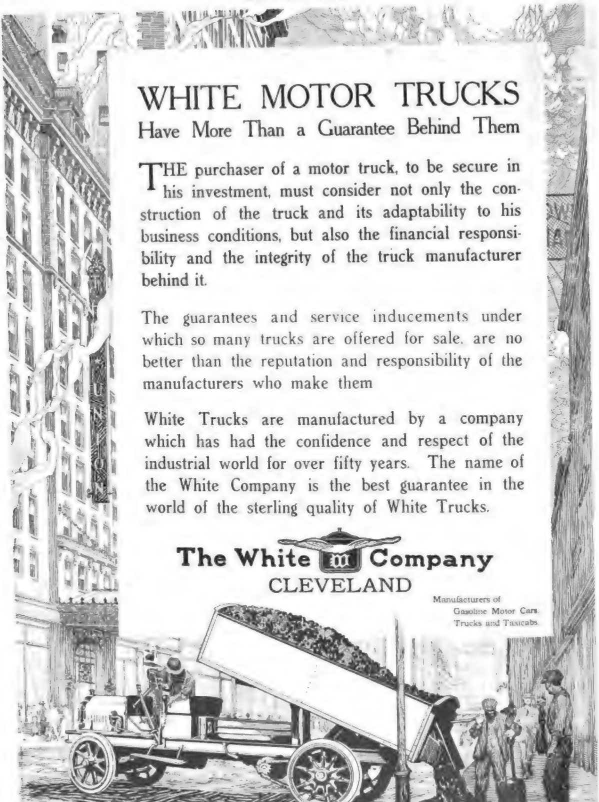

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CHICAGO, AUGUST 8, 1912

$3.00 PER YEAR

OTOR AGE

Rules for the Smaller Cities

Motor Age Sounds Chiefs of Police as to Their Needs in This Line and Discovers Kansas City Has Regulations That Seem to Be Closest the Ideal

By William B. Stout

MORE uniform traffic laws for our larger cities is the demand of the hour among motorists.

More intelligent control of traffic, both pedestrian and vehicle, as a real need in all our congested communities.

With nothing but horse and foot traffic the rules of the past have sufficed for our conditions, but with the adoption of the motor vehicle for both freight and passenger work, with the greater added expense of idle time, there must be not only adopted but enforced, regulations which shall better care for the new traffic and its same movement, and at the same time present a uniformity in all cities which shall not confuse the tourist or traveller who drives his car in many cities. Reform is the need of the hour.

As motor cars have come into use new regulations have been demanded in our cities to fit them; slower vehicles have been forced to keep to the curb and, depending on the size of the city and the degree of traffic congestion and laws have been framed to fit each individual case without any attempt at uniformity throughout the country. As a result tourists in passing through different cities, ignorant of the laws of each particular place are coming into contact with the police through lack of knowledge of the local regulations.

It is time for the motorist to insist on the adoption of uniform laws for traffic in all the larger cities, but first must be determined the most logical code. As a means of arriving at a definite conclusion as to what regulations were necessary and advisable in the average case a series of questions was sent by Motor Age to the traffic heads of over 100 cities whose population ran between 25,000 and 200,000 asking for information as to what laws were in use already in each locality and what laws were favored. The entire list of questions is shown in another column. The tabulation of the replies received from forty different representative cities shows the sentiment, as follows:

1—In favor of requiring slow vehicles to keep to the curb 39
Opposed 1
2—In favor of stops with right side only to curb 40
3—In favor of lights on all vehicles at night 20
Opposed 10
Doubtful 2
Eight did not answer this question.
4—In favor of signals on turning.......... 40
5—In favor of keeping outside of point of street intersection in turning to left.. 40

district or outside of business hours."—Manchester, N. H.

"Yes, it works better to have the parking space open and to call by numbers."—Atlantic City, N. J.

"Makes it easier for the officers to handle traffic on certain streets."—Woonsocket, R. I.

"Spaces are allotted for this purpose, therefore avoiding confusion and delaying of traffic."—Richmond, Va.

"No. Believe the police should regulate these conditions according to circumstances. They have the power to act here."—Albany, N. Y.

"Yes. It allows freedom of other traffic and means quick clearance when owners come to get their machines, to drive away."—Dayton, O.

These answers seem to show two different viewpoints; one that of the theater proposition and the matter of getting the line away after the show, and the other the idea of car parking in the city during business hours. In nearly all cities there are streets where cars can stand and others where they are not permitted. Ordinarily the handling of the machines after the theaters is in the hands of the police.

The most important question, especially in regard to the larger cities is that of pedestrian control. Few cities have taken this up as yet though twenty in the list given express themselves favorably. Only five are opposed.

Controlling Pedestrians

In the list favorable are Dayton, O.; Richmond, Va.; Omaha, Nebr.; Sacramento, Cal.; Salt Lake City, Utah; Fall River, Mass.; Kingston, N. Y.; Watertown, N. Y.; Woonsocket, R. I.; Everett, Wash.; Waterbury, Conn.; Atlantic City, N. J.; etc., cities of a size to realize traffic congestion and treat it as a hindering factor. A pedestrian clause forcing those on foot to the use of sidewalks and crossings alone will be the eventual rule, with no cutting across corners at street intersections.

In looking over the regulations of all of the cities represented in the list of replies important regulations not mentioned in the questions are found some practical and some out of date.

"Horse-drawn vehicles shall have right of way over power-driven vehicles, except street cars," says the Peoria, Ill., regulation.

Nearly all cities have a muffler ordinance and also a rule against dripping of oil on the highway; also rules as to right of way of fire, police, ambulance and repair apparatus. Few cities of size now allow a vehicle to be backed up to a curb except during the actual time of loading or unloading and then in some cases with a time limit.

Peculiar Regulations

A number of peculiar and unusual regulations show themselves in special suggestions which are undoubtedly the result of a demand made by conditions in the certain localities involved.

Alameda, Cal., has a provision making it unlawful to draw vehicles in tandem between 6 A. M. and 9 P. M., or any freight vehicle drawn by more than four horses, or any freight vehicle which with its load shall exceed 24 feet in length or the total width of which shall exceed 8 feet. This rule applies to the central district only.

Knoxville, Tenn., enforces a rule demanding the reduction of the power of all street car headlights coming into the city limits to 100 candlepower, and the muffling of the headlight so that the rays are confined to the track ahead and will not blind the drivers of other vehicles. A rule is also enforced to the effect that no motor car shall tow or pull another one or disabled machine with a space of more than 8 feet between the two machines.

Elgin, Ill., has a rule which gives the man on the left at intersecting corners the right of way.

A large percentage of the cities investigated have a rule against the hauling of noisy loads, such as lengths of iron and steel that might strike together and produce a clatter.

Atlantic City, N. J., suggests a law compelling all chauffeurs to pass a test and examination before an inspector before being allowed to operate on city

A VEHICLE TURNING TO THE LEFT SHALL PASS AROUND THE CENTER OF INTERSECTION OF TWO STREETS

Questions Asked by Motor Age

1—Are you in favor of a traffic ordinance requiring slow moving vehicles keeping close to curb? (Give reasons)..................

....

2—Are you in favor of compelling all vehicle, horse or motor driven, requiring to stop to do so with right side (only) to curb? (Give reasons) ....

....

3—Are you in favor of all horse vehicles carrying a light when on streets between sunset and sunrise, said light to show yellow or white in front and red in rear? (Give reasons)

....

4—Do you favor a driver of horse or motor being compelled to look to the rear before turning left across a street in the middle of a block or at a street intersection, or to require him to give a signal by raising the hand vertically or extending it horizontally so as to be seen by vehicles following closely behind? (Give reasons) ....

....

5—Do you favor making it imperative for horse and motor vehicles to keep outside of the center point of street intersection when turning to left? (Give reasons)...........

....

6—Do you favor horse or motor vehicles turning around on streets only at street intersections? (Give reasons)...................

....

7—Do you insist on at present strict observance of not permitting horse or motor vehicles standing beside curb within a distance of 30 feet (more or less) from a water hydrant for fire protection purposes?

....

8—Do you favor the establishment of parking space along the curb on certain streets for horse or motor vehicles to remain in while waiting for church services, theaters, dinners, business engagements, etc.? (State your views definitely) ....

....

9—What is the total number of men on your police force? ....

....

10—Total policemen on day work?..........

11—Total policemen on night work?.........

12—Total policemen on day traffic?.........

13—Number of police you think necessary for proper control of traffic in your city?......

....

14—Have you a recognized rule governing right of way of traffic in different directions at street intersections: To explain, has north and south traffic the right of way over east and west traffic, or vice versa? (State your views) ....

....

15—At how many street intersections in your city should a traffic policeman be stationed with whistle to regulate vehicles, to give right of way to north and south vehicles at one time and to east and west at other?.........

....

16—Do you favor regulation of pedestrian traffic at street intersections where vehicle traffic is regulated as in section 15?..........

17—What additional regulations do you favor (State definitely)..................

....

Model Ordinance for Smaller Cities

SECTION 1. The owner, operators, driver or person in charge of any car, dray, wagon, carriage, buggy, motor cycle, tricycle, bicycle, or the streets of Kansas City, Missouri, shall conform to and observe the following rules and regulations upon all such streets, alleys, avenues, boulevards, park roads and public places in said city.

Section 2. The word "vehicle" includes equestrians, led horses and everything on wheels or runners, except street cars and baby carriages.

Section 3. The word "horses" includes all domestic animals.

Section 4. The word "driver" includes the rider or driver of a horse, the rider of wheels and the operator of a vehicle, motor cycle, or street car.

Section 5. The term "congested district," as used in this ordinance, shall include all that portion of the city lying........................

....

....

Section 6. The roadbeds of highways are primarily intended for vehicles; but pedestrians have the right to cross them in safety, and all drivers of vehicles shall exercise all proper care not to injure pedestrians. Pedestrians when crossing a street shall not carelessly or maliciously interfere with the passage of vehicles.

Section 7. Pedestrians crossing any street at the intersections thereof with another street within the congested district, shall pass over such portion of the street as is included within the lines of the sidewalk projected, and not diagonally.

Section 8. The driver or person in control of a vehicle in slowing or stopping shall signal those in the rear by raising whip or hand.

Section 9. No vehicle shall be turned unless a signal shall previously be given by the whip or hands indicating the direction in which the turn is to be made.

Section 10. No person in control of a vehicle shall back the same without ample warning having been given; and, while backing, care must be exercised not to injure those in the rear.

Section 11. Police, fire department, fire patrol, United States mail vehicles, and ambulances, shall have the right of way in any street.

Section 12. Every person in charge of a vehicle shall pull to the right of the street or road when signaled from a vehicle behind desiring to pass.

Section 13. 'That upon the approach of any fire apparatus, police patrol or ambulance, every vehicle shall draw up as near as practicable to the right curb of the street and remain at a stand-still until such apparatus, patrol or ambulance shall have passed.

Section 14. The driver of a street car shall immediately stop his car and keep it stationary upon the arrival of any fire apparatus.

Section 15. Street cars shall have the right of way, between cross streets, over all other vehicles, except as provided in section 11.

Section 16. The driver or person in control of any vehicle upon a track in front of a street car shall turn out upon a signal from the motorman or driver of the car.

Section 17. Every person in charge of any vehicle upon any street approaching any street car which has stopped or is about to stop for the purpose of taking on or discharging passengers, shall stop or slow down to a reasonably safe rate of speed not exceeding 6 miles per hour, and shall not approach said street car close enough to interfere with passengers boarding and leaving said street car.

Section 18. No vehicle or street car shall so occupy any street as to interfere with or interrupt the passage of other cars or vehicles.

Section 19. Vehicles and street cars shall not stop on the cross walk so as to interfere with the passage of pedestrians.

Section 20. Vehicles shall be driven in a careful manner and with due regard for the safety and convenience of pedestrians and all other vehicles.

Section 21. Every person using any vehicle on any street in the city of Kansas City shall operate, drive or ride such vehicle on the portion to the right of the center of the street, except where the right side of the street is in such condition as to be impassable.

Section 22. Vehicles moving slowly shall keep as close as possible to the curb on the right, allowing more swiftly moving vehicles free passage to their left.

Section 23. A vehicle meeting another shall pass on the right.

Section 24. A vehicle overtaking another shall pass on the left side of the overtaken vehicle and not pull over to the right until entirely clear of it.

Section 25. A vehicle turning into another street to the right shall turn the corner as near to the right hand curb as possible.

Section 26. A vehicle when turning to the left to enter an intersecting street shall not turn until it shall have passed beyond the center of such intersecting street.

Section 27. Vehicles crossing from one side of the street to the other shall do so by turning to the left so as to head i
tion as the traffic on the stre

Section 28. No vehicle
around upon any street wit
district unless said vehicle
to the next cross street and
the turn to the left after re
of said cross street.

Section 29. No vehicle sh
left side to the curb within
trict or upon any boulevard

Section 30. No vehicle, un
ency or to allow another veh
to cross its path, shall stop in
near the right hand curb ther
to obstruct a crossing.

Section 31. On all ave
divided by parkway, walk, s
duct, vehicles shall keep to
division; and red street ligh
center of driveways at inters
indicate this rule of the road
keep to the right," and this
must be complied with on all
turns of boulevards and p
lights are so located or not.

Section 32. No vehicle sh
ing in front of, or within 25
of the entrance to any theat
public or office building whic
three stories high, except w
discharging passengers or
only for such length of tim
for such purpose.

Section 33. No vehicle s
any public street for the pu
and discharging freight betw
9 a. m. and 7 p. m., w
a public alley which has con
premises where said freight
or received and such delivery
ticable through said alley.

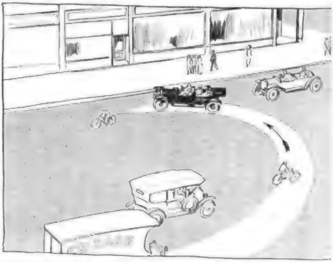
Section 34. No vehicle s
the intersection of any street
district or within 10 feet fro
roadway.

Section 35. No vehicle,
and vehicles of fire, police,
ments and United States ma
through a procession except
sion of a police officer.

Section 36. At theaters a
ings, or under unusual circu
shall stand or move as dire

Section 37. Vehicles sha
travel two or more abreast in

Section 38. No horse no
animal attached to a vehicle
to stand upon any portion of
vard, parkway, avenue or p
city, unless the driver there
and accompanies the same, o
mal be securely hitched to
hitching post; nor shall an



IN TURNING ALWAYS TURN TO THE LEFT SO AS TO HEAD IN THE STREET TRAFFIC ON THAT SIDE OF THE STREET

streets. Such a rule is of course already enforced in many of the larger cities.

Wilkes-Barre, Pa., is one of the cities having a rule requiring a standing vehicle to give way to one about to load or unload, to take on or to leave passengers. Five cities in the list forbid traffic cutting through any processions.

The chief of police of Manchester, N. H., is dissatisfied with the bulb horn as a means of signalling, favoring something quicker acting and more insistent.

The Sacramento chief of police makes the following addition to the list of questions sent him:

Suggestions from Sacramento

"All vehicles should be compelled to stop at least 15 feet behind street cars while street cars are stopped to let passengers on or off. No vehicle should be allowed to pass a street car on the left-hand side. All motor cars and motorcycles should be compelled to keep their mufflers closed."

Everett, Mass., suggests conditions where traffic should be confined to one direction in narrow thoroughfares.

"We are doing fine with what we have," says Cedar Rapids, Ia. "Some cities have so many regulations controlling traffic that the officers or the citizens have never had time to learn them all."

These are merely listed ideas from different localities, some of the suggestions already included in the traffic codes of many cities, but the viewpoint of the different sections of the country and different sizes of communities
gestions interesting.

Of all the regulations
was none more comprehe
able than that of Kansas
sas City is a little large

Kansas City's Traffic Regulations

mule or animal be permitted to stand upon any boulevard, parkway, avenue, street or park road to the obstruction of the same or to the inconvenience of travel.

Section 39. No horse shall be unbitted in any street or highway unless secured by a halter.

Section 40. No person shall in any street or highway remove any part of a vehicle or any part of the harness of a horse without first unhitching the horse or horses attached to said vehicle.

Section 41. No one shall ride or jump any vehicle without the consent of the driver: and no person when riding shall allow any part of the body to protrude beyond the limits of the vehicle, nor shall any person hang on to any vehicle whatsoever.

Section 42. No person shall drive a vehicle loaded with iron or other material likely to produce a great annoying sound without using proper deafening substances.

Section 43. No vehicle shall be left standing in a street or alley at night without light or lights so displayed as to be visible from any direction.

Section 44. A vehicle shall remain backed up to a curb only long enough to be loaded or unloaded.

Section 45. Horses attached to vehicles and the shafts of unhitched vehicles, when backed up to the curbs, shall be turned at right angles to the vehicles or at as nearly this angle as possible.

Section 46. When taking up or discharging freight or passengers, vehicles within the congested district shall be headed in the direction of traffic on the right of the roadway. So far as practicable, freight, coal and ice wagons and other heavy traffic shall be unloaded from the right side and not from the end of the wagon and shall be drawn in close to the curb.

Section 47. No person operating a self-propelled vehicle shall permit the motors of same to operate in such a manner as to visibly emit an unduly great amount of steam, smoke or products of combustion from exhaust pipes or openings.

Section 48. No person when driving a vehicle with a horse or horses attached thereto, shall cease from holding the reins in his hands to guide and restrain the same; nor, when not riding, cease from walking by the head of the shaft or wheel-horse, either holding or keeping within reach of the bridle or halter thereof.

Section 49. Every hackney, carriage, cab or cabriolet used for purposes of hire, when driven on the streets between the hours of sunset and sunrise, shall have fixed on some conspicuous part of the outer side thereof, two lighted lamps, with plain glass front and sides on which shall be painted in legible figures, at least one inch long, the registry number thereof; and shall also exhibit at least one red light visible from the rear. Every motor car, when operated upon any public street, boulevard, parkway or park road, shall carry, between the hours of sunset and sunrise, at least one lighted lamp showing white, visible at least 200 feet in the direction towards which the motor car is proceeding, and shall also exhibit at least one red light visible in the reverse direction. All other vehicles, motor cycles, bicycles, tricycles and velocipedes, except draw vehicles, while in use on the streets, boulevards, parkways or park roads, between the hours of sunset and sunrise, shall display one or more lights on the outside of such vehicle, so as to be distinctly visible 100 feet from both the front and the rear; if but one light shall be displayed upon such vehicle, it shall be placed on the left side.

Section 50. Every motor car, motor vehicle or motor cycle using gasoline or other explosive mixture as a motive power, shall use a "muffler" which shall be sufficient to deaden the sound of the explosions, and such muffler shall not be disconnected or cut out while such motor car, motor vehicle or motor cycle is being operated upon any street or avenue, boulevard, parkway or park road within the city of......
....

Section 51. Every bicycle, tricycle, velocipede, automobile, motor car, motor truck, motor cycle, and other horseless vehicle, car, engine or machine, except baby-carts and toy-wagons, in use upon the streets of Kansas City, Missouri ....
shall have attached thereto, a gong, bell, horn or other adequate signal in good working order and of proper size and character sufficient to give warning of the approach of such vehicle, car, engine or machine to pedestrians and to riders and drivers of other vehicles and to persons entering or leaving street cars; but such gongs, bells, horns and other signals shall not be sounded except when necessary to give warning: PROVIDED, that no such gong, bell, horn or other signal shall produce a sound unusually loud, annoying or of distressing character, or such as will frighten pedestrians or animals; or extreme noises, as "sirens" or similar instruments that produce unusually loud, annoying or distressing sounds: PROVIDED FURTHER, that this section shall not apply to public ambulances, vehicles belonging to fire or police departments of the city, or vehicles required to respond to alarms of fire or other emergency calls.

Section 52. Every person operating a motor vehicle on the public streets, boulevards or parkways or park roads within the city, shall drive the same in a careful and prudent manner, and a rate of speed that shall endanger the property of another, or the life or limb of any person or persons; provided that driving in excess of the following rates of speed for a distance of more than two hundred feet shall be presumptive evidence of driving at a rate of speed which is not careful and prudent.

(a) Twelve miles per hour on ....
and 15 miles per hour on all other park roads *within any public park* of the city.

(b) Fifteen miles per hour upon streets, avenues and boulevards or parkways within the congested district.

(c) Twenty miles per hour upon all other streets, roads, avenues, boulevards, parkways or parts thereof within the limits of..........
....
provided, however, that in passing any street intersection, crossing or cross walk, within the limits of ....
the rate of speed for driving shall not exceed 10 miles per hour when any person or vehicle is upon said intersection, crossing or cross walk, with whom or with which there is or may be danger of collision.

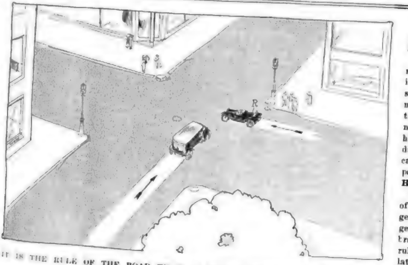
Section 53. No person shall drive any public or private automobile, motor car, motor cycle or self-propelled vehicle who is less than 18 years of age.

Section 54. Between the hours of 7 a. m. and 7 p. m., no vehicle shall remain stationary for a longer period than 60 minutes within the district bounded by north side of..........
....
side of .... the south
the west side of..................................
and the east side of..............................
except for the purpose of receiving and delivering passengers and freight, and when said 60 minutes shall have expired and said vehicle shall not have been moved for a greater distance than one block, then it shall be construed to have remained stationary.

Section 55. That it shall be the duty of the police department of the city of Kansas City, Missouri..............................to enforce all the provisions and terms of this ordinance, and to that end, every person driving, operating or propelling any vehicle, shall stop the same immediately upon the request or upon the signal from a police officer, such signal to be given by the officer raising his hand, club, or blowing his whistle.

Section 56. Any person who shall violate any provision of this ordinance shall, upon a first conviction thereof, be punished by a fine of not less than one nor more than $200; upon a second conviction, shall be find not less than $10 nor more than $200; and upon a third conviction thereof shall be fined not less than $25 nor more than $200.

Section 57. All ordinances, or parts of ordinances, in conflict with this ordinance, are, in so far as they so conflict, hereby repealed.



IT IS THE RULE OF THE ROAD THAT AT STREET INTERSECTIONS RIGHT HAND VEHICLE HAS THE RIGHT OF WAY

of 200,000 placed by Motor Age, but it would seem as if these regulations would be suitable for smaller cities, being typical of the rules in force in the cities under 200,000. In these rules are included the best of nearly all the suggestions made, and it would seem to fit almost every requirement of ordinary traffic. The regulations for Cincinnati and several other cities of larger size clearly follow it and yet it is not too unwieldy for smaller places having their own traffic problems.

The little traffic folder sent out by the police department of Kansas City is published on pages 8 and 9.

It will be noted that sections 6 and 7 related to the control of pedestrians. This item is ordinarily not so important with smaller cities but is coming to be recognized even there as an important item of traffic congestion. Delays at street corners especially may be largely due to the hindrance of foot traffic dodging in all directions, not only hindering in itself but calling for increasing watchfulness on the part of the drivers.

Holding Pedestrians in Check

With the increase in value of idle time of running as the motor truck is more generally adopted there will come a more general recognition of the pedestrian branch of street traffic and more stringent rules in regard to its control. The regulation against crossing intersections of downtown streets diagonally already is being enforced in several cities.

Section 10 in relation to backing of vehicles, is included in but very few of the city regulations examined.

The clause of section 17 relating to vehicles near stopped street cars is not sufficiently strong for a number of the larger cities.

Norman Church Explains the Atlas

Pacific Coast Tradesman Tells How He Became Interested in Bidding for Engine Plant in Indianapolis—Claims Plans Upset by the Everitt People Desiring to Get In

CHICAGO, Aug. 3—The deal between Norman W. Church of Los Angeles, Cal., and Walter E. Flanders of Detroit in connection with the plant of the Atlas Engine Works of Indianapolis has been called off and following the announcement Mr. Church has told of the negotiations which, it was expected, would result in the purchase of the Atlas Engine Works and the occupation of the big factory of the Flanders Motor Car Co., which was to have been organized for the purpose of turning out a car to sell at $1,000 or under.

"About May 1 information reached me through banking interests that it would be possible to secure control of the Atlas plant," says Mr. Church. "I knew the factory and its possibilities and I realized what a big thing it would be to get it and turn it into a factory for the production of cheap cars. I first of all talked to W. F. McGuire, then factory superintendent of the Ford Motor Co. of Detroit, and he, too, saw the opportunities Then we determined to interest Walter E. Flanders, the three of us to swing the deal. Mr. Flanders was agreeable and we proceeded with our plans.

"We determined to use the Flanders prestige to the utmost and decided to call the new concern the Flanders Motor Car Co., Mr. Flanders having discovered that his Studebaker contract did not stop him using his name in other businesses. This was after he had gone into the Everitt deal. When he joined the latter combination he was under the impression that his hands were tied so far as using his name was concerned.

"Investigating affairs at the Atlas plant, we found that it would be necessary to put the concern through a friendly bankruptcy, which was done, and we were prepared to close the deal at the receivers' sale which was held last Monday. I was called from Los Angeles and when I got east I found that the Everitt people had raised an objection to Flanders using his name for the company I was forming, claiming that it was doing them an injustice and robbing them of prestige that should be theirs. The next angle was when they insisted that the entire Everitt company be taken into the Atlas deal. I refused and rather than see the affair go by the boards I offered to withdraw entirely with the financial backing I had, including Mr. McGuire, and leave the field to the Everitt people. This they refused to take up and as I would not let them into the original Church-McGuire-Flanders combination the deal whereby the Atlas plant was to have been sold last Monday fell through. Mr. Flanders and myself are no longer connected in the deal. I am making this statement in order that the inside facts in connection with the matter may become known."

KNIGHT-ARGYLL DECISION

London, July 30—Justice Neville, in the course of his judgment in the case of Knight vs. Argyll, announced by cable in last week's Motor Age, said that to claim for the patent for this invention the title of a master patent was, he thought, extravagant. The inventors declared the primary object of their invention to be to provide an improved form of internal combustion engine in which the moving parts should be directly connected and positively acting and the use of poppet valves and springs avoided. They declared, held the court, that the invention consisted in certain features of novelty in the construction, combination, and arrangement of parts, all as fully described and more particularly pointed out in the claims. They then enumerated the parts and declared that either the cylinder described or a member telescoped with it should be operatively connected with the piston, but so far the court had not been told which of those parts was to be moved, the invention being in effect declared to be compatible with the movement of either. They then proceeded to tell the court that in the exemplification of the invention shown in the drawings of the two telescoped parts the cylinder was the one to be moved.

Justice Neville thought as a matter of construction that the exemplification was an exemplification in which one of two alternatives was adopted, but that subject to that the succeeding parts of the specification describe the invention itself, and not merely one way of carrying it into effect. As he read the specification, the invention was for a combination, and not for all means of carrying a new principle into effect nor for a novel application of a principle.

The present case showed the great care which should be exercised in allowing amendments to the claims in a specification, particularly where there was no opposition. The comptroller was doubtless told, as his lordship had been told, that the alteration was merely a verbal one, but clearly it could not have been intended to narrow the claim, he thought. It was, therefore, either wholly immaterial and should have been disallowed on that ground, or it must have been intended to widen the claim and therefore was illegal, held the court. In
had in the present action be
in effect as altering a clai
ously limited character in
widest possible extent, and
conclusion was that upon
struction of the specificati
nats had not infringed.

Justice Neville regarde
"as a somewhat audacio
resuscitate a patent for a
small compass and, to say
of very moderate utility, a
of an amendment to make
embrace a wide field of e
comparatively modern type
and so far as he was
attempt failed and he dismi
with costs."

GOODYEAR MARKETING

New York, Aug. 5—The
and Rubber Co. of Akron
keting the remainder of
issue of $5,000,000 of 7 pe
tive preferred stock th
Trask & Co., of New Yorl
the new certificates will b
tember 1, according to the

The total amount to b
amounts to about $1,600,00
ket has stood above par f
on this issue. The circ
Spencer Trask & Co show
cent of the total output
consists of pneumatic tire
mated gross earnings for
ending October 31, 1912,
neighborhood of $25,000,
applicable to dividends of
cording to the balance s
in summarized form the as
pany amount to 200.6 per
ferred stock issue and 13
quick assets.

After January 1, 1915, t
poses to create a sinking f
retire $250,000 of the pref
year thereafter at or belo
dend by purchase in the
by direct call. The prefe
precedence of the common
cipal and dividends and th
lien against the property
than a year to run.

DECISION IN HORN CAS

Providence, R. I., Aug.
of the United States distri
district of Rhode Island,
application of the Lovell
Co. and others for an in
vent the Waite Auto S
dealing in Newtone horns
ing in Klaxon and Kla
from dealing in Newtone
the same time dealing
Klaxonet horns. Affidavit
on both sides and argum
from both points of vi

Willys Seeks to Set Aside Gramm Deal

Suits Filed in Toledo Against A. L. White and W. T. Agester, Fraud Being Claimed by Overland Man, Who Wants Notes Returned and the Contract Annuled

TOLEDO, O., Aug. 3—A sensational suit was this week filed in the common pleas court at Toledo, O., by John N. Willys against A. L. White, president, and W. T. Agester, treasurer, of the Gramm Motor Truck Co., of Lima, Ohio, asking the court to set aside a contract entered into last April on grounds of fraud.

Mr. Willys alleges that on last April 15, he was induced by certain representations on the part of defendants, to enter into an agreement whereby he was to purchase 400 shares of the stock of the Gramm company at its par value; that he paid to defendants the sum of $50,000 in cash and gave his promissory notes due one for $75,000 on August 1, one for $75,000 due on September 1, one for $100,000 due on October 1, and one for $100,000 due on November 1. He alleges that the notes and stock were deposited in the National Bank of Commerce, at Toledo, Ohio, which is also made a party defendant.

Willys claims that at a meeting of the stockholders of the Gramm company, held last September, and which was controlled by White and Agester, the company was authorized to the A. C. W. Realty Co., 1,000 shares of stock, for a fictitious indebtedness, and caused the company to issue a delivery certificate, dated August 1, 1911, without receiving any compensation therefor. It is claimed that Ira B. Carns, a stockholder in the Gramm company, controls this concern.

It is further alleged by Mr. Willys that at the same meeting a dividend of $225,000 was declared payable in stock, and a division of stock was authorized when the company had no surplus capital. Shares were then distributed to the number of 750 to the A. W. C. Realty Co., 221 to A. L. White, 150 to W. T. Agester and 196 to I. P. Carns, making a total of 1,142 shares. Willys alleges that White and Agester then voted to themselves respectively 755 and 800 shares of the common stock of the concern, and that the whole amount of 4,000 shares then was sold to him at par.

He states that the company had no surplus to divide but had lost large sums; that it had no legal right to any real estate, but that it occupied the plant under a contract to purchase the property, and that it is indebted in the sum of about $135,000, none of which facts were made known to him at the time of purchase. He asks the court to grant the relief denied by defendants; that he may have his notes returned to him, that the contract be annulled, and that he may recover the $50,000 already paid over for the stock in the company.

Hahn, solicitor for the defendant company, moved that the application be denied and on July 29 the court held and ordered that the motion for injunction be denied. The main contention of the suit itself will be tried out upon final hearing which will probably be had early in the fall.

OHIO COMPANY AFFAIRS

Cincinnati, O., Aug. 5—The secretary of state of Ohio has authorized the amalgamation of the Jewel Carriage Co. and the Ohio Motor Car Co., both of Cincinnati. Heretofore the Ohio car was manufactured and sold through the Jewel Carriage Co., but by the change the Jewel Carriage Co. will forever lose its identity and the business will be carried on by the Ohio Motor Car Co., the carriage end of the business having been sold to the American Carriage Co., of Cincinnati, several months ago. This company is also building a plant at Colborne, Ontario, where the Canadian Ohio will be built. The officers of the Ohio Motor Car Co. are Charles F. Pratt, president and general manager; A. E. Schafer, vice-president and factory manager; Charles M. Anderson, secretary; O. M. Bake, treasurer; H. T. Boulden, sales manager, and R. E. Northway, engineer.

RUTENBER DEAL CLOSED

Marion, Ind., Aug. 5—Confirmation of the report in Motor Age of the reorganization of the Western Motor Co., manufacturer of Rutenber motors, and the fusion of the new blood into its directorate, is confirmed today by an announcement by the Rutenber Motor Co., successor to the above named company. The new firm has been incorporated with a capital of $1,350,000, with George W. Bowen, of the Bowen Mfg. Co., of Auburn, N. Y., as president, and a large investor. The management remains practically the same, and it is announced that the output of the new organization, after extensive improvements in facilities, will be more than doubled.

GARFORD-WILLYS DEAL CLOSED

Toledo, O., Aug. 3—The formal taking over of the Garford company's plant at Elyria, O., by the Willys-Overland Co., took place in Toledo, O., on Thursday, when, at a meeting of the Overland directors, John N. Willys was elected president of the Elyria company, which will be known in the future as the Garford department of the Willys-Overland Co. At this meeting, A. L. Garford resigned as president of the company bearing his name, the interests which he owned in it being taken by the Willys-Overland organization. Mr. Willys' full title will be president and general manager of the Garford department, in which capacity he has been acting for some time. The new department will be largely managed from Toledo. Mr. Willys will retain his office in that city. For some time, the sales departments of the two factories have been operated jointly, and after the first of next month, all departments will be similarly conducted.

KELLY IN NEW TIRE DEAL

New York, Aug. 5—Charles F. C. Kelly, formerly of the Kelly-Springfield Rubber Co., of Racine, Wis., and Harry E. Field, former president and sales manager of the Hartford Tire and Rubber Works, of Hartford, Conn., and at present president of the Thomas B. Jeffery Co. of New York, have just terminated negotiations with the Lee Tire and Rubber Co., of Conshohocken, Pa., whereby the entire production of tires of both concerns will be marketed by the Kelly-Field Co. Mr. Field will remain with the Rambler people until the expiration of his contract.

HIGHER RATES TO COAST

Los Angeles, Cal., Aug. 3—The first copy of the transcontinental west bound freight tariff naming rates from all eastern shipping points to southern California points, made its initial appearance July 29. It goes into effect September 2. This rate sheet points out the fact that the rates on motor cars have been advanced from 10 to 30 cents per 100 pounds. It is estimated that the increase will cost the dealers in Los Angeles in the neighborhood of $35 a carload. The rates to the east are also to be increased and with the many changes said to affect the shipping of parts, this will mean considerable of a loss in net revenue to the dealers.

CANADA STOPPING SMUGGLING

Montreal, Que., Aug. 1—Wholesale smuggling of motor cars between the United States and Canada has been going on this summer, and the Canadian customs officials have already punished several offenders while the Canadian manufacturers are bitterly protesting against American-made cars being brought into Canada without payment of duty.

Naturally the majority of dealers in the city who represent United States firms, either deny the charge or refuse to discuss it at all; but the fact remains that Special Customs Officer O'Shea has had a busy time of it all summer working up evidence upon which seizure could be made, and at least one agent, who is interested in a Canadian make of car admits it.

MOTOR AGE
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SUBS
Unite
Other

Reducing Fuel Consumption

HOW many miles do you get to the gallon of gasoline with your car? This question is becoming more and more important since gasoline retails at 18 and 20 cents per gallon and in many places as high as 25 cents. With the old time low rates of fuel little attention was paid to the gasoline bill; the cost of fuel per mile was low compared with the cost of tires or other car expenses Today there is a change. Tires have been improved, tire mileage has been increased, but gasoline cost has risen. This has turned the owner's attention to the question and it has also turned the attention of carbureter makers to the problem involved. Heretofore with carbureter makers the big aim has been to give speed and flexibility without regard to the cost. Scarcely a driver who tours has not been impressed with the odor of burned fuel given off by cars met on the highways. Occasionally one or two cars will pass without the pungent odor behind it, but they are rare. Every case of the strong pungent odor is an example of poor carburetion; an example of too much fuel for the amount of air used; an example of useless expense to the car owner.

WITH many car owners the extravagant use of gasoline is frequently attributed to the pedal accelerator, which is used almost exclusively for supplying the mixture to the cylinders. The accelerator is greatly abused and is directly responsible for much of the over-consumption of fuel and also to the cost of motor maintenance. On rough roads the driver's foot, controlling the accelerator, is constantly vibrating, and every vibration means a change in motor speed. This gives anything but ideal motor conditions. With the motor speed altered nearly every consecutive second unnecessary strain is placed upon the crankshaft and the other motor parts. At one time the pedal is depressed to the full, placing enormous strains on the motor parts, and perhaps a second later the entire fuel supply is as suddenly cut off. This situation has led many owners to criticise the accelerator, and it is responsible today for many owners using the accelerator only in emergency cases when the hands are occupied in other duties. There are many drivers who use the steering wheel control exclusively for road driving, and in every case the motor performance and condition is one to attract special attention of the onlookers.

THERE is not any reason why the accelerator condition cannot be improved. With a host of cars its construction can be improved so that its action is more constant and not so at the mercy of the road irregularities. One or two makers have used such designs in the past and the wonder is that they have not been generally imitated by other makers, as nothing patentable was connected with their makeup. With such designs, of wedge-shaped contour, the driver's foot rests firmly on the car floor and increases in speed are accomplished by sliding the foot forward on the floor and decreases by moving it backward. True, it is not so easy to move the foot in this way as it is to raise and lower it by pivoting on the heel, but for the extra work the results obtained are important. Other commendable pedal designs have been brought out which call for a side movement of the foot, but their following has not grown very much. The accelerator pedal has come into general use and is here to stay, but it will have to be improved if for no other reason than the extra fuel it uses and the unnecessary strains it places on the motors.

Greater Tire Atte

IN spite of the fact that scores—in fact, tho ers look upon tires as the most costly pa yet it is questionable if there is any other pa they neglect with such consistency. Example hand. An owner of a touring car generally will, nine times out of ten, take a load of four trip without increasing his tire pressure. T rarely have the right side tires inflated more ones, although it is a certainty that for 90 per car is running the right side wheels carry a h left side ones.

IF you ask 50 per cent of the owners why t such work they invariably give the answe guaranteed for 3,500 miles and they are co cost on that basis; they further answer that i get the tire pump out from under the rear se fail to keep the inflation proper solely be venience of the tire pump and the work ne with it. It is commendable that many car m power air pump to the gearbox or motor of to be hoped that soon inflating tires will be taking on gasoline or oil. Today the tire v to strenuously by the owner-driver. He is actually pays dearly for his neglect.

TIRE makers can help car makers in impr tion. There is not any reason why a stamped with the maximum load it should c pressure to which it should be inflated. Tir lets showing the necessary air pressures, bu rence that the owner-driver has such a list inflating his tires. Garagemen can assist i to proper tire inflation by posting near to inflation the schedules of inflation, but even ble because of the great difference in pressu sizes as recommended by different tire make made and it should be soon.

ADDED tire mileage can be obtained given to the filling up of surface cracks of preventing the water getting in and so in starting the destruction of the casing. It is an owner to pay any attention to the hole in a nail puncture, and yet this hole is often water reach the tire fabric and pave the wa later date. There are on the market tods preparations intended to meet the needs of are rarely used. The driver imagines that rubber is such that the hole will be perman there is not any opportunity for the water quently cuts a fraction of an inch in length tread or side walls. These should receive e may be that a small garage vulcanizer is is necessary, namely, that they should receiv ticular case perhaps dictating the nature o needed. In practically every case it will b see that the work is done, as it is rare that garage man will recommend or insist on suc

xport Report Sensational One

C., Aug. 3—The
r cars during the
e 30 reached the
21,757, valued at
nearly double the
s fiscal year, when
es shipped abroad
12,965,049. This is
ade in the history
car industry and is
he worth of Ameri-
prise of the makers
for their product
the exports of cars
mark but the ex-
tires, likewise in
ising in value from
fiscal year 1911 to
scal year 1912.
e number of cars
1,941, valued at
vith parts, except
$361,835, as com-
alued at $1,702,872,
$324,886, exported
).
nts of cars for the
consideration were

—June—	
No.	Value
327	$ 222,961
67	49,905
27	35,787
42	35,185
161	161,123
755	1,026,567
7	8,470
30	31,822
167	174,145
146	143,376
136	158,478
76	68,355
—12 Months—	
No.	Value
5,716	$4,454,448
574	469,721
288	226,227
211	193,037
1,223	1,031,434
6,288	7,560,655
273	418,599
329	850,440
1,611	1,911,066
3,625	3,280,988
1,137	1,197,155
482	456,369

e that during the
3 cars, valued at
d, together with
ed at $304,144.
fiscal year the
o 888 machines.
h parts imports
imports for the
forty-two cars,
parts valued at
ear ago the car
achines, valued
ed at $15,748.
e two periods
as follows:

	—June—	
	1912	1912
	No.	Value
0	7	$17,105
4	21	50,106
3	3	8,806
5	5	10,425
2	6	14,485
	—June—	
	1912	1912

Foreign Business Double That of Corresponding Month Last Year

Imported from—	No.	Value	No.	Value
United Kingdom	128	$297,382	188	$434,611
France	377	797,931	401	964,635
Germany	137	297,153	116	259,313
Italy	130	239,079	131	199,555
Other countries	116	267,298	127	276,067

Exports of motor car tires during the fiscal year ended June 30, 1912, amounted in value to $2,657,809, as against $2,085,107 worth exported during the previous fiscal year. The exports for the month of June increased in value from $246,625 in 1911 to $321,889 in 1912.

The total imports of india rubber during the fiscal year just ended amounted to 110,210,173 pounds, valued at $93,013,255, as against 72,046,260 pounds, valued at $76,244,603, imported during the fiscal year 1911.

The imports for June last amounted to 6,815,153 pounds, valued at $5,442,859, while in June a year ago the imports amounted to 6,322,768 pounds, valued at $5,508,081.

The fact that the motor car makers of the United States are annually making great strides in their invasion of the foreign markets, is brought out forcibly in a monograph entitled "Foreign Markets for Motor Vehicles" just issued by the federal bureau of manufactures. This publication is a compilation of reports from American consuls stationed in every part of the globe, and is arranged with the particular end in view of aiding American manufacturers to extend their foreign sales. It describes the peculiarities of the various markets, special local conditions and prejudices to be considered, foreign competition to be met and the best methods of selling cars.

Canada is the United States' best market, the majority of the cars in use in the territory of our northern neighbor being either made entirely in the United States or made by Canadian branches or affiliations of American firms. The highroad clearance, flexibility and moderate price of the American car are steadily winning it favor in regions where highway conditions are similar to those in the United States. The market in Australia and New Zealand is already being well cultivated by American exporters, while Argentine, Brazil and Uruguay in South America, and British South Africa are named as promising fields for future sales. It is estimated also that there are more American than European cars in use in Mexico.

In the far east, Ceylon, India, Japan, Siam, and the Straights settlements are the most likely markets. China has little use for motor cars, as most of the roads of that country do not permit their use. The reputation of American-made cars in India suffered some years ago because some inferior cars were sent among the earlier shipments to that country, but the cars brought from the United States recently have been of such high grade as to dispel this prejudice. In the Straits settlements the principal buyers are wealthy Chinese, who demand comfort and luxury in their cars rather than high power. As a result, low-hung, smooth running cars are the most popular, and the local trade often demands that each car be fitted in accordance with the individual taste of the owner. Right-hand drive is essential there, as in the orient all traffic turns to the left, instead of to the right, as in the United States.

The United Kingdom has been and continues to be an excellent market for American cars, ranking next to Canada in purchases from the United States, but the sales in continental Europe have thus far not been extensive.

Coming Motor Events

August 8—Minneapolis-Winnipeg tour.
August 8-9—Banta trophy team match, Chicago Motor Club.
*August 8-10—Galveston beach meet; Galveston, Tex.
August 10—Hill climb; Whittier, Cal.
*August 30-31—Elgin road races; Chicago Automobile Club; Elgin, Ill.
*September—Commercial vehicle run; Chicago Motor Club.
September 2—Track meet at Winnipig, Canada.
September 3-6—Chicago Motor Club's truck demonstration.
September 17 — Grand Prix; Milwaukee, Wis.
*September 20—Wisconsin challenge and Pabst Trophy races; Milwaukee, Wis.
*September 21—Vanderbilt road race; Milwaukee, Wis.
September 17-20—Fire engineers' convention; International Association Fire Engineers, Denver, Colo.
September—Track meet; Universal Exposition Co., St. Louis, Mo.
*October 7-11—Chicago Motor Club reliability run, Chicago.
October 12—Track meet; Rockingham park, Salem, N. H.
November 6—Track meet; Shreveport Automobile Club, Shreveport, La.

*Sanctioned by A. A. A.

SHOWS

September 23-Oct. 3—Rubber show, Grand Central palace, New York.
September 26-Oct. 6—Exposition agricultural motor cars, Bourges, France.
November 8-16—Olympic show; overflow November 22-30 Agricultural Hall.
December 7-22—Paris salon.
January 4-11, 1913—Cleveland show.
January 11-18—New York pleasure car show; Automobile Board of Trade; Madison Square Garden and Grand Central Palace.
January 11-22—Brussels, Belgium show, Centenary Palace.
January 20-25—New York truck show; Automobile Board of Trade; Grand Central Palace and Madison Square Garden.
January 20-25—Philadelphia show.
January 27-Feb. 1—Detroit show.
February 1-8—Chicago show.
February 10-15—Minneapolis show.
February 17-22—Kansas City show.
March 3-8—Pittsburgh show.
March 8-15—Boston show.
March 17-22—Buffalo show.
March 19-23—Boston truck show.
March 24-29—Indianapolis show.

Work Started on Vanderbilt Cup (

MILWAUKEE, Wis., Aug. 6—Workmen are busy on the 8.2 miles of road comprising the Vanderbilt cup course, and fourteen new culverts of the most advanced type already have been completed and the approaches graded. Two bridges are now under construction and should be completed by August 10. The roads are all of macadam and have been down for more than 15 years, so there is no danger from settling as with new macadam. The surface is being scarified and a layer of 4 inches of No. 2 rock is being added. Two inches of fine screenings will complete the surface, which after being treated with a 70 per cent asphaltum preparation as a binder, will be rolled to granite-like surface and later oiled and sanded several times. Contractor Michael Schmidt says the roads will be ready for preliminary practice on September 1 at the very latest. No cuts and but a few fills are necessary.

The 2.5 miles of concrete road which will comprise part of the course will be ready at the same time as the rest of the work. The concrete work is in the hands of the county, while the remainder is being done at the expense of the township of Wauwatosa. The announcement of the selection of the new course was not made until the county board had delivered a bond insuring the completion of the concrete roadwork by August 31. R. H. McGucken & Co., contractors of Milwaukee, are in charge of this part of the work, the supervision being in the hands of H. J. Kuelling, county highway commissioner.

It has been decided to place the start and finish line in the center of the Burleigh street straightaway, which comprises the lower leg of the course. It is also fixed that the racing cars will run clockwise, instead of counter-clockwise, as on tracks and speedways. The location of the grandstands on Burleigh straightaway will rob those in the choice start and finish seats of the excitement and high speed which will be made on the two 3 mile straightaways, the north and south Fond du Lac roads, but it will give the crowds lined along the unreserved part of the course something better than usual. They will be able to see the cars sweep up or down a 3-mile stretch on each side of the course, and it is there that the highest speed and spectacular work will be in view.

Three trunk street car lines make access to the grandstands and reserved parking spaces easy. Bleachers will flank the grandstands and a set of uncovered stands will be located just before the city limits turn at the southeast corner. The grandstands are on the south side of the course, facing away from the sun. Two huge scoreboards will be set opposite the stands, on each side of the official and press towers. There will be eight scoreboards in all,

Milwaukee Loses No Time in Preparing for Road Carnival

operated by electricity in one circuit, giving every spectator on the course the standings at the same time as they are flashed to the main grandstands.

Provision has been made for six hospitals and signal stations, distributed over the course at points of vantage. The entire frontage, inside and outside, of the north and south Fond du Lac and Town Line roads, three legs of the course, is unreserved parking space, divided into fifty divisions.

The main grandstand will consist of two sections, to the left and right of the start and finish line. Each half will contain twenty-four sections of nineteen tiers each. There are fourteen seats in each tier. In front of the seat sections there will be a promenade, then two sections of boxes in two tiers, each containing fifty boxes, making a total of 200 boxes with six seats each. Forty boxes nearest the start and finish have been priced at $40 each and the remainder at $30. Ten grandstand sections in the center, five on each side of the line, have been priced at $1.50 the seat and the remainder at $1. Reserved parking spaces opposite the grandstand, each accommodating 100 cars and so limited, will be charged for at the rate of $30 for the space. Other parking space around the course will cost $15 down to $10 per space, according to advantage of location. In addition to these prices, each person occupying any seat, box, parking space or other location must pay a general admission fee of $1, the receipt for payment being an identification tag which must be conspicuously displayed on the person.

Access to the stands and parking spaces will be by the roads comprising the course, under the supervision of the clerks of the course and the militia. The roads will be closed at 9:45, 15 minutes before the start of each of the four races on the program. Warning bombs will be fired in series to clear the course, the first at 9:15, two at 9:30, three at 9:45 and four, signifying the start of the race, at 10 sharp. The race program is as follows:

Tuesday, September 17. The race for the Automobile Club of America's gold cup, the American grand prix, at 385.4 miles or forty-seven circuits of the 8.2 mile course.

Friday, September 20. The race for the Pabst Blue Ribbon trophy, the gift of Colonel Gustav Pabst, of Milwaukee, at 205 miles, or twenty-five circuits; and the race for the Wisconsin Challenge trophy, the gift of the Wisconsin Motor Mfg. Co. of Milwaukee, at 164 miles, or twenty circuits.

Saturday, September 21—The eighth annual race for the William K. Vanderbilt, Jr., cup, at 278.8 miles, or 34 circuits.

As entries for all races do not close until midnight, September 14, the M. A. D. A. is making no effort at this time to classify and publish t tions on hand. Ther there will be between cars entered in the f M. A. D. A. is figur contests in case the e above these figures.

READY FOR BI

Galveston, Tex., A timed to the last word the most noted drive are tonight camped on course here in readi meet which begins Th

Held in connection v ton carnival and under Galveston Automobile State Automobile Ass beach event has serve from all sections of t and also from many with wide reputations and who have been co racing since its incept

Now that Galveston the mainland, since t new causeway, motor every part of the sta thousands and every i of the city is tonight parking their cars in structed tent garage a lines of small tents a the beach comprising camping out.

Among the stars on compete are Neil National; George DeW specially-designed fro ster; Louis Disbrow, w Joe Nikrent, Farmer Ulbrecht, and the Stu

A. A. A. SUSPEN

New York, Aug. 3— today by the contest can Automobile Associ suspension of the Sch Cincinnati until Jan advertising a stock the 500-mile race at the Schacht finished claims the advertisin agency without its au soon as the discovery been published it stop

The contest board Joe Dawson and his m for competing in an u at Memphis, Tenn., stand until the two c it should be lifted. J suspended for not a after he had made stated, it being held ciently punished by racing at Scranton an

Fifth Race Added to the Elgin Program

Hugh B. Andrews of Scranton, Pa., promoter of the meet at Wilkes-Barre, July 20, was debarred and declared ineligible for further sanctions to January 1, 1913, for failure to properly oil the track or remove the top rails of the fences.

The contest board, having been furnished with the original ticker tape, used at Santa Monica and the Los Angeles motordrome, has approved the following records:

SANTA MONICA ROAD RACE, LOS ANGELES

Car	Driver	Miles	Time
	Free-for-all		
Fiat, Tetzlaff		303.012	3:50:57
	231-300 class C		
Mercer, DePalma		151.506	2:10:43.85
	161-230 class C		
Maxwell, Joerlmann		101.104	1:37:57.90

All these are non-stock records.

Tetzlaff's average, 78.72 miles per hour

SPEEDWAY RECORDS REGARDLESS OF CLASS

Driver	Car	Place	Date 1912	Miles	Time
Bragg	Fiat	Los Angeles	May 5	3	1:54.86
Bragg	Fiat	Los Angeles	May 5	4	2 33.37
Bragg	Fiat	Los Angeles	May 5	5	3:11.75

CLASS C SPEEDWAY RECORDS
161 to 230 Inches

Driver	Car	Miles	Time
Tower	Flanders, Special	25	21:12.42

Los Angeles, May 5, 1912.

CLASS C SPEEDWAY RECORDS.
231 to 300 Inches

Driver	Car	Miles	Time
De Palma	Mercer, Los Angeles	1	00:45.60
De Palma	Mercer, Los Angeles	2	1:31.53
De Palma	Mercer, Los Angeles	3	2 17.17
De Palma	Mercer, Los Angeles	4	3:02.70
De Palma	Mercer, Los Angeles	5	3:17.34
De Palma	Mercer, Los Angeles	10	7.27.33
De Palma	Mercer, Los Angeles	15	11:11 17
De Palma	Mercer, Los Angeles	20	14:56.05
J. Nikrent	Case, Los Angeles	25	18:53.20

May 5, 1912

Class for Cars 230 and Under Carded by Chicago Promoters

CHICAGO, Aug. 6—A fifth event has been added to the Elgin road racing card which is scheduled for contest on August 30-31, the Chicago Automobile Club and Elgin Automobile Road Race Association having decided to put on a class for cars of 230 cubic inches piston displacement and under at a distance of 96 miles. Permission to do this has been secured from the American Automobile Association and the race will be run the first day in conjunction with the Aurora trophy and the Illinois cup.

It is stipulated that there must be at least two different makes of cars competing, and the prize money consists of $300 for first place and $200 for second. There are two entries certain, the Studebaker Corporation having agreed to enter the two cars it is racing at Galveston this week. In addition, W. G. Wordingham, local agent of the Herreshoff, has promised at least one entry, either the racing car he already has or one of the company's new six-cylinder models.

While no new entries have been received within the last few days, the promoters have assurances of plenty of support, so there is no worrying over the entries. Another effort has been made to get the Peugeot to enter. E. C. Patterson, of Chicago, agreed to import one of the Peugeots, with Boillot for driver, and now the pot has been sweetened by the agreement of R. J. Collier, of New York, publisher of Collier's Weekly, to stand sponsor for a second Peugeot which he will enter both at Elgin and Milwaukee. David Bruce-Brown is taking a personal interest in this and has cabled his friend Boillot, urging him to make the trip to this country. It is expected a definite reply will be had this week.

Out at Elgin the promoters are about to start work on the course. This is not a hard proposition this year, because the circuit weathered well. Contractors say that the work can be completed within a week or 10 days and that the course will be faster than ever.

Military protection is assured by Governor Deneen, who has written Allen Ray of the Chicago Automobile Club that he will permit of the soldiers being used for this purpose. It is likely the guards will come from the Second, Third and Fourth regiments, negotiations already having been started.

NINE IN WINNIPEG TOUR

Minneapolis, Minn., Aug. 3—Nine entries were made by August 3 for the fourth annual tour of the Minnesota State Automobile Association August 8-15 to Winnipeg, when the list closed. In the non-contestant class there are two entries which will be increased.

The entries for the touring class are: Marmon, Fawkes Automobile Co., Bohn Fawkes, driver; Mitchell, F. E. Murphy Automobile Co., George Murphy, driver; Paige Detroit, same, Mat Miles, driver; Warren-Detroit, same, Ross Parker, driver; MacFarlan, John P. Snyder Automobile Co., Paul Carpenter, driver.

Light car class: Hupmobile, R. W. Munzer & Sons Co., C. Munzer, driver; Flanders, Studebaker corporation, winner of Wisconsin tour, W. H. Soules, driver; Cutting, Hudson-Thurber Co., W. H. Lincoln, driver; Cadillac, Zekman Automobile Co., A. Zekman, driver.

Noncontestant, H. J. Clark, Packard; Dr. H. G. Blanchard, Waseca, Minn.

Pilot car, Interstate, Tri-State Automobile Co.; pacemaker, Stoddard-Knight, Northland Motor Car Co.; press, Oldsmobile, Oldsmobile Co. of North America, and Pierce-Arrow, O. A. Brietson Co., Brookings, S. D., members of Luverne, Minn., club.

The start will be made at 8 a. m., August 8, from the Hotel Saint Paul, St. Paul. Dr. C. E. Dutton, state president, will have charge in the absence of Judge E. W. Bazille, chairman of the tour.

PROBES HUB'S CAR UPKEEP

Boston, Mass., Aug. 3—Following the discharge of Chief Clerk Casey of the school commission of a charge of joy-riding in using the motor car belonging to the commission, the Boston finance commission has inserted its probe into the care and maintenance of the city motor cars. It was Casey's second offense, and the first time he suffered a reduction in salary of $500 a year. It is expected that when the report of the finance commission is made public some startling figures will be given out and there may follow some drastic action.

According to the city auditor's books, $89,473.35 was spent during the past fiscal year on the fifty four cars and trucks in the service of the city. The figures show that the public works department spent the larger amount, but as it has seventeen cars this is not surprising.

Mayor Fitzgerald, although he has but one car, he has spent $5,494.09 for its maintenance, or more than the car cost the city new. This is nearly as large as the amount spent for the maintenance of all seven cars by the police department. The mayor has just bought a new car for $3,200. The cost of maintenance for the departments follow: Bath department, three cars, $6,845.07; park department, four cars, $7,781.67; health department, four cars, $3,327.04; school department, two cars, $4,505.48; public works department, central office, one car, $1,162.31; bridge and ferry division, three cars, one out of use, $4,755.66; paving division, three cars, $5,706.29; sanitary division, two cars, $1,947.87; street cleaning division, two cars, $3,980.50; sewer division, four cars, $4,004.24; water division, three cars, $7,989.17.

That some of the cars are used for evening and Sunday outings is well known. When the matter of joy-riding came up before the council passed an order to have all city cars marked, but this is a joke, for the cars bear little metal plates a few inches square with initials only on the sides near the running boards where they are not noticed.

It is expected that following the finance commission's report there will be established a municipal garage where a check can be kept on all cars. Now they are kept anywhere and the chauffeurs can get them any time they want them and the officials get the cars, too, at any old time, it is said. Often no records are kept of the time they go out and in as required by law, because the bills are paid so promptly and no questions asked, it is said.

Standards Discussed by Detroit S. A

Local Chapter Decides National Committee Should Be One to Take Up Matter with Authorities at Washington—Testing Laboratory for Use of Makers Urged

DETROIT, Mich., Aug. 3—The keynote of the meeting of the Detroit section of the Society of Automobile Engineers held on August 1, was the discussion of the proposed standards work to be done for the motor industry by the bureau of standards at Washington. It was the general sentiment of the members of the section present that any negotiations which are to be carried on with the bureau should be done by the national council of the society, since the communications of this body would carry more prestige than would those of any local branch of the society.

Referred to National Body

A motion made by H. W. Alden, discharging the Detroit committee which was appointed to confer with the officials of the bureau of standards and recommending that the work be carried on by a committee appointed by the national council of the society, was carried. It was also recommended that J. O. Heinze and E. J. Stoddard, who have been active in the work on behalf of the Detroit section, be placed on this national committee.

In discussing the matter of seeking government co-operation in arriving at certain motor car standards, Mr. Stoddard brought out that the matter should be very cautiously handled, and that the society should wait for all developments. In the committee's communications from the bureau, Professor Stratton, its head, suggested unofficially that the society send to Washington a representative who would be given the bureau's facilities for any desired line of research. He also suggested that the society compile a list of the things which it desires to know and what figures it wishes to obtain, so that there would be a working basis. Mr. Stoddard proposed a committee of the society to compile such data. There would then be a group of practical men interested at this end and theoretical men at Washington, and thus the two bodies would work together advantageously. The bureau apparently is very enthusiastic over the matter in Mr. Stoddard's opinion.

Mr. Heinze also advocated that the negotiations be carried on through the national body of the society. He thinks that the Detroit section has not been specific as to what it really wants to know, and thinks that the data desired should be formulated, as it will be impossible to get co-operation from the bureau unless the line of investigation is clearly known. He questions that the bureau has the apparatus to conduct tests on every point which the society desires. Like Mr. Stoddard, he thinks that unless the matter is conducted nationally by the society, it will not be gone at in the right way, as it will carry more prestige if nationally carried on.

G. W. Dunham and J. G. Perrin held practically the same opinions on the subject, while F. H. Floyd, when asked to give his views, stated that since he was not familiar with the steps that have been taken in the work, he could only discuss it from the standpoint of fuel standardization. At the present time we do not exactly know what a motor fuel is. The trade is calling naphtha gasoline, while half the time we are neither using gasoline nor naphtha, but a fuel of still different gravity. It is an open question as to whether the fuel can be standardized, and to avoid any confusion if such were done, it might be styled motor fuel.

Mr. Dunham very correctly stated that the society should not have to hunt for things to standardize, but if it found that there are really some things which should be standardized, then all such should be listed and submitted to the bureau through Coker Clarkson, general manager of the society.

Views of D. F. Graham

D. F. Graham stated that one thing which could be standardized to immense advantage and on which there is a wide difference of opinion is the exact size of gauges and plugs for accurate measurements. There is a difference in the manner of use of micrometers, which often results in varying ideas of the same accurate dimension. It is hard to tell just what the size of a hole or the diameter of a piece is. Standards for such measurements should all agree, and since each manufacturer cannot afford to carry such a set due to its expense, one set should be kept for the use of all.

In further discussing the subject, Mr. Heinze made the society's position clear by stating that it should ask the bureau of standards to tell it only the things which it cannot find out for itself, due to the lack of apparatus for such research, or to lack of time to carry on such exhaustive tests as such information would necessitate. The bureau is maintained for the purpose of laying down fundamentals of measurement, and not to pass upon the relative merits of any pieces of apparatus, such as magnetos, carbureters, and so on. For example, two fuels may have different heat values with the same specific gravity. If we could say that a fuel is to have a given heating value with a given specific gravity, then we would have arrived at a standard for that fuel. So with three kinds of steel,—crucible electric. They have e analysis, yet their prope It is for the purpose of best of the three, for bureau exists. It is ve the society to make it standardization it wants

Proposed Testing Labor

In speaking of the pro oratory in Detroit, for t car manufacturers, as summer meeting of the Heinze stated that whil vately owned laboratorie good, none of them is e were one which had s fessor in charge who wa mercial considerations, the time he needed to d laboratory would be of expense of such an ins much less than the total individual laboratories. cost about $100,000 if should be, and Mr. H unless it could be done it would had better be

A committee was app a set of by-laws for th which up to this time ha them. This committee W. Alden, chairman; E. Graham; Milton Tibb Greenburg.

The talk which was t by Mr. Parkinson of t pany on the Golden Glo poned until a later date ness of the hour when was completed.

ROAD CONGRESS OUT

New York, Aug. 5— ment as applied to the lem of building and roads is to be the keyno Road Congress to be hel September 30 to Octob of the congress, which dation of the conventio American Association provement, the America sociation and the Natio Machinery and Material to deal with every phas ject in an orderly and

At this congress civ thoroughly considered i road management. Gen chairman of the United commission, will make o on this subject. He w portance of putting th merit test, to every ma to do with the supervis

Every other phase of will be handled in the s

ner. Bankers will discuss methods for safeguarding a proper accounting of taxes and assuring business methods in obtaining loans or making bond issues to build good roads. There is to be a legislative section which will endeavor to point the way to needed reforms in road legislation. The president of the American Bar Association is lending his assistance to preparation of the program for this particular section of the congress.

In conjunction with the congress, there will be a conference of educators with a view to having highway engineering introduced in colleges on a scale that will meet modern requirements. Engineers experienced in road building are not plentiful and if the colleges could be induced to introduce the right kind of courses one of the greatest needs of the road movement would be supplied.

BRITISH COLUMBIA MILEAGE

Vancouver, B. C., Aug. 3—The following statistical information showing the mileage in the different sections of British Columbia, and the comparison of the increase from 1902-3 to 1910-1911, the last available figures, are given in a booklet recently issued by the Canadian Highway Association:

	1902-3	1910-11
Alberni	338	437
Chilliwac	391	105
Cariboo	1,510	1,933
Columbia	890	944
Atlin	391	893
Comox	200	273
Cowichan	200	200
Cranbrook	664	689
Delta	99	290
Dewdney	143	190
Esquimalt	152	246
Fernie	334	457
Greenwood	112	190
Grand Forks	234	255
The Islands	96	153
Kamloops	727	1,000
Lillooet	1,052	540
Nanaimo	35	45
Newcastle	200	200
Okanagan	373	1,720
Richmond	178	150
Revelstoke	474	478
Similkameen	472	1,042
Skeena	169	1,040
	10,503	15,406

NEW ROAD FOR GEORGIA

Savannah, Ga., August 3—Plans are now being prepared for the preliminary survey of the line of the proposed motor road from Savannah to Tybee island, Georgia's great seaside resort, and engineers are now at work selecting the route. Work will begin as quickly as possible after the preliminary survey has been accomplished. The road will be equipped with toll gates. A company has been organized to finance the project. A number of large subscriptions to the stock already have been made.

A roadbed of at least 24 feet from the city to the ocean is the plan of those who have the project in hand. Considerable work has already been done in securing the right of way to the island. Several tentative routes are under consideration. No barriers have yet been encountered by the promoters. Indeed, it seems to be the general policy of property owners to help in the undertaking.

Evidence that the promoters of the turnpike movement are in earnest is furnished by the fact that a charter of incorporation for the Savannah and Tybee Turnpike Co. has been filed in the superior court. Those who stand sponsor for the company are D. C. Talbott, John E. Schwarz, Claude M. Stubbs and John Bell, all of Savannah, and Hugh W. Fry, of Roanoke, Va.

The petition asks that the charter cover a period of 20 years, and that the capitalization of the company be listed at $500,000, with the privilege of increasing it to $1,000,000 later. Permission is asked of the court to construct and maintain a toll road between the city of Savannah and Greater Tybee Island, together with such toll gates, trestles and bridges as may be necessary, including drawbridges at such streams as this form of structure may be required. The petition also asks that the company be empowered to enter into contracts for construction, to buy material and to do such other things as may be necessary to insure the success of the venture.

Tybee island is 18 miles distant from Savannah. It is connected with the city only by a one-track branch road of the Central of Georgia Railway, and by water, of course. There is no dirt road to the island. The government reservation of Fort Screven is located on the island. It has long been contended that the government ought to build a military turnpike to Tybee in order to insure a line of retreat in case a shell from the enemy's ship should interrupt traffic over the railroad.

Car Makers Convene at Christmas Cove

S. A. Miles Acts as Host at Midsummer Meeting of N. A. A. M.—Railroad Rates and Insurance Occupy Most of Time at Business Session—Committees Will Investigate

NEW York, Aug. 5—One of the most pleasant gatherings of the National Association of Automobile Manufacturers was held last week at Christmas Cove, Me., when the regular July and August sessions of the association were combined and conducted at the summer home of Samuel E. Miles, general manager of the association.

The business session, which was held on Monday, occupied about 4 hours and was largely devoted to the consideration of routine matters. One of the interesting matters that was discussed was the recently announced advance in freight rates on motor cars consigned to the Pacific coast. The former rates are $3 per 100 pounds in carload lots from Ohio, Michigan and Atlantic seaboard common points to Pacific coast common points. The new rates differentiate between New York and New England common points; Buffalo common points and Detroit common points and raise the rates respectively to $3.30, $3.20 and $3.10 per 100 pounds.

As the general practice is to ship two large cars or three medium sized cars in a car, the raise would mean an advance in cost of shipment on motor cars from New York and New England of about $15 per vehicle; $10 per vehicle from Buffalo and common points and $5 per vehicle from Detroit and its common points.

Just what will be done about the matter is still problematical, but the case has been referred to James S. Marvin, traffic manager of the association.

Another pertinent subject discussed was the problem of insurance. Arguments were made that the rates charged for the various kinds of insurance were so high that many car owners were not taking out policies. This resulted in limiting the business of the insurance companies and the tendency was to cause owners of cars who were most liable to accident and mishap and who could not afford to do without insurance, to furnish a considerable part of the total business. Under these circumstances it was quite likely that the ratio of losses paid would be larger than they would if the business was on a more reasonable basis and consequently broad and general.

No action was taken officially by the association but the matter was referred to a committee for investigation and report.

Most of those who attended the meeting arrived at Portland on Saturday morning and were taken to Christmas Cove via motor cars. Sunday was spent in recreation as was most of Monday and all day Tuesday. Many of the visitors stayed over Wednesday and a few were still left to enjoy the hospitality of Mr. and Mrs. Miles at the end of the week.

F. BRISCOE OUT OF U. S. M. CO.

New York, Aug. 5—Frank Briscoe, one of the vice-presidents of the United States Motor Co., who has had charge of the designing department, has resigned. He will sail for Europe late in August to make a study of European motor car engineering. He probably will remain abroad for a year. While resigning his office in the United States Motor Co., Mr. Briscoe will continue as president of the Briscoe Mfg. Co.

Weak Rules Govern Belgian Grand Prix

Team Contest Results Unsatisfactorilly, Becoming Somewhat Farcical Because Contestants Take Advantage of Loophole in Methods of Timing the Cars

HERMES CROSSING BRIDGE AT ANSEREMME IN BELGIAN GRAND PRIX

ANSEREMME, BELGIUM, July 21—Belgium ran its grand prix race under experimental rules, and found them unsatisfactory. Instead of the usual practice of declaring the fastest car the winner, it admitted in its race teams of three and imposed a minimum average per round, according to cylinder area. The team most nearly adhering to this average was to be declared the winner. It admitted cars varying in cylinder area from 2 to 4½ liters, the average speed for a 3-liter car, for instance, being fixed at 40 miles an hour. This average had to be maintained on individual rounds; loss of time on one round could not be made up by speeding on another one. The manufacturers themselves had decided on the averages. They were of the opinion that it would be very difficult for any set of cars to maintain them, in view of the hilly and winding nature of the course.

Boillot Fools Officials

The Peugeot company entered a set of 3-liter cars prepared for the French grand prix, and Boillot, who acted as race manager for his drivers Goux, Zuccarelli and Thomas, got a verbal agreement from the committee that in case of dead heat the cars most closely adhering to the average would be given the advantage. It was an easy matter for these lightweight racing Peugeots to cover the 30-mile course at a speed of 40 miles an hour. Boillot, taking advantage of the defect in the rules, stationed himself 300 yards from the timers' box and as his cars came round stopped them and gave them the start so that they could run over the line within a few seconds of their official time for finishing at the average speed imposed. So well was it done that the differences between the fastest and the slowest of the twelve rounds was not more than 5 seconds for any one of the three cars. But four other teams—Mercedes, Opel, Minerva, and Hermes—finished without the loss of points, though not with the same absolute and artificial regularity, and when Boillot claimed the advantage he was informed that all five sets of cars were considered equal.

There was a wordy battle, in which the jury remained firmly to its decision that the second day's run of 360 miles should be started with the five teams classed equally. Dissatisfied at the decision, the Lion-Peugeot men were given the order to go all out on the second day, while the Minerva managers, who had objected to the artificial timing of the Peugeot men, openly adopted their tactics. The crowd got on the course during the initial round and to avoid disaster, Goux had to brake furiously. The effort caused injury to his universal joint, necessitating a roadside repair, which made it impossible for his Lion-Peugeot to finish the initial road in the limit imposed. He had no further trouble, and ran throughout at an average of 50, but his point penalization was ineffacable. Later Zuccarelli had trouble with his overhead timing gear, which caused his elimination. This left Thomas as the only clean-score man of the team and officially put the Frenchmen out of business.

Minerva, which ran with the Knight motor of 3.1 by 4.8 inches bore and stroke, finished the 720 miles at the imposed average of 38 miles an hour, thus securing the maximum number of points for its team of three. Hermes, a Belgian firm with a four-cylinder model of 2.8 by 4.7 inches bore and stroke, also maintained its average—35 miles an hour—throughout the distance, being classed equally with Minerva. The jury decided to share all the prizes between these two.

Work of the Cars

Mercedes, running the biggest car in the race, a Knight four-cylinder of 3.9 by 5.5 inches bore and stroke, lost a point through one of its cars being late as the result of a slipping clutch; its general running speed was far above the average imposed. Opel, with a four-cylinder of 2.7 by 5.1 inches bore and stroke, lost 6 points through failure to keep up the average. Schneider, starting with only two cars, lost one of them towards the end of the race with a broken steering gear. Sava, F.A.B., and Miesse withdrew all their cars. Germain put in a valveless car, but rear axle trouble caused its withdrawal. America was represented by a Ford, an absolutely stripped chassis driven by a local agent, which steered wildly on the road and ran into a tree towards the end of the first day. The following are the official particulars of the cars, and speeds imposed:

Car.	Bore and Stroke.	Cyl. Area Cubic Inches.	Speed Imposed M.P.H.
*Minerva	3.1 x 4.8	183	40
Hermes	2.8 x 4.7	122	35
*Mercedes	3.9 x 5.5	274.5	44.4
Opel	2.7 x 5.1	128	35.3
Lion-Peugeot	3 x 6.1	183	40
Schneider	3.2 x 5.5	183	40
Germain valveless	3.6 x 5.9	244	43
Sava	3.2 x 5.5	183	40
F.A.B.	2.9 x 4.7	134.2	35.5
Miesse	3.5 x 5.5	219.5	42
Ford	3.7 x 4	177	39.9

*Knight motor.

Continental fitted the winning Minerva team with tires. Just before the start of this race Michelin made the official announcement that he would take no further part in motor car racing.

FINAL DECREE FAVORS WEED

New York, Aug. 5—Final decrees in the suits for infringement of the Parsons non-skid patent have been entered in the United States district court against the Newhall company and the Seneca Chain Co. on application of the Weed Chain Tire Grip Co. The last step in these prosecutions was not contested and the decrees were by consent of the defendants.

National Reliability Starts October 7

Run Expected to Last 10 Days—Everitt First to Enter A. A. A. Contest with Three Cars—Flanders Electric Making Satisfactory Progress Blazing Trail to New Orleans

DETROIT, Mich., Aug. 6—Detroit being the start of the national endurance run of 1912, naturally this is the news center. Here are being received reports from the pathfinders who went out in a Flanders electric last Wednesday, while other news concerning the tour emanates from here.

It has been decided that the tour will start October 7 and that it will finish in New Orleans about 10 days later, with the Sunday stop in Memphis. Entry blanks now are out and specify that the Glidden trophy is offered for the team competition, the Anderson trophy for the runabout contenders, while the touring cars will compete for a new trophy to be hung up by the American Automobile Association.

The first three entries for the tour come from the Everett people, who have been given numbers 1, 2 and 3.

Reports from the pathfinders are interesting. A telegram from Indianapolis states that the scouts reached there Saturday noon. Sixty-five miles that day completed a total mileage of 346.5 by the speedometer for just 3 days of traveling. The actual tour distance as entered on the log book is 312.5 miles.

The route was altered from the schedule roads Saturday and the pathfinder came from Muncie to Indianapolis via Yorktown, Daleville, Chesterfield, Anderson, Pendleton, Clarksville, and Noblesville.

A telegram from Louisville Monday night stated that the pathfinders reached Louisville late that evening, having made a record run for 1 day over country roads in their Flanders electric coupe. The distance traveled was 138 miles officially, but 145 miles was made owing to the party becoming lost in the darkness.

The hills were very steep, including one 3 miles in length and with grades of 15 to 20 per cent and with forty-three turns. Many miles of the road were extremely sandy. No incident other than becoming lost occurred to mar a perfect day's run, the weather being altogether favorable. The recent four-states tour, returning to Indianapolis took 2 days to make this run.

PITS AND GRAND STANDS IN BELGIAN GRAND PRIX—MINERVA PASSING

PRIZES AWARDED RANCHMEN

Dallas, Tex., Aug. 3—The prizes for the Farm and Ranch tour of Texas were awarded this week. The fifteen successful contestants in the race drew lots for the $300 loving cup. It was won by W. H. Camp, a ranchman of San Gabriel, Texas.

Of the twenty-six cars entered in the contest, fourteen in the touring class and one in the roadster class finished with a clean score, no penalties having been assessed against them.

The following announcement of the prizes was made by Colonel F. P. Holland this week:

The first and second cash prizes amounting to $850 for the second prize in the roadster class for which there was no contestant, or a total of $900, were divided equally among the fourteen contestants coming in with clean scores and the driver of each car receives $64.27 in cash. The name, the postoffices of each contestant and the name of the car driven is as follows: W. R. Bishop, Carrollton, Texas, Franklin. J. M. Howe, Forney, Texas, E. M. F. W. R. Mickle, Plano, Texas, Chalmers. J. R. Pennington, Whitewright, Texas, Buick. R. B. Dunn, Bryan, Mitchell. B. W. Bean, Howe, Texas, Studebaker. D. W. Rutherford, Waxahachie, Texas, Maxwell. O. L. Sims, Paint Rock, Texas, Overland. J. Mantel, Dallas, Texas, Hudson. H. V. Kendrick, Moody, Texas, Buick. S. J. Hall, Malakoff, Texas, Hupmobile. W. H. Camp, San Gabriel, Texas, Reo. W. R. Newton, Hillsboro, Texas, Ford. R. G. Roach, Dallas, Texas, Ford.

The first prize of $100 cash was won by L. B. Blair, of Alvarado, Texas, in a Maxwell car.

The following individual prizes were awarded:

One Disco self-starter, given by the Hudson company for the oldest man who finished first and acted as driver all the way—J. R. Pennington, of Whitewright.

One silver loving cup, given by C. H. Verschoyle of Dallas, to the owner of the car coming the longest distance to enter the tour—O. L. Sims, Paint Rock.

One set of Kelly-Racine tires by the Mitchell company to the Mitchell car making the best score—R. B. Dunn, of Bryan.

One silver loving cup by the United Motor Co. to the Maxwell for making the best score—D. W. Rutherford, Waxahachie.

One set of plain casings, one set of inner tubes, one set of Moore tire-saving jacks by the Case company, to the Case car coming in first, the longest distance to enter the race, and the Case car having the least number of penalties—All won by W. H. Anderson, of Kerens, Texas.

One silver loving cup by the Buick company to the Buick car making the best score.—J. R. Pennington, Whitewright, Tex.

One silver loving cup by the Ford company for the best score made by a Ford car.—R. G. Roach, Dallas, Tex.

One silver loving cup by the Halff company for the Chalmers car making the best score.—W. R. Mickle, Plano, Tex.

One set of tires by R. G. Langley to the Franklin car making the best score.—W. R. Bishop, Carrollton, Tex.

Besides the winners in the tour, the following were contestants: W. C. Kingsley, Garland, Cadillac; B. H. Matthews, Mart, Oakland; B. N. Colwick, Norse, Mitchell; V. Coleman, Kerens, Overland; V. F. Wilkerson, Ferris, Oakland; H. L. Perkins, Ennis, Buick; W. A. Hamilton, Dallas, Hupmobile; M. C. Christian, Elm Mott, Brush; W. F. Famming, Iowa Park, Ford; L. I. Wilmas, Irving, Buick.

Four cars had time penalties. They were: W. H. Anderson, Kerens, Case; W. C. Kingsley, Garland, Cadillac; B. F. Wilkerson, Ferris, Oakland; H. L. Perkins, Ellis, Buick.

Several interesting events took place. Several of the cars were wired with baling wire. One car came in on three wheels.

Pacific Highway Association M

Annual Session in San Francisco, Cal., Develops Great Enthusiasm

SAN FRANCISCO, CAL., Aug. 6—Special telegram—With more than 100 good road enthusiasts present from all parts of the Pacific coast from Alaska to Mexico, the third annual convention of the Pacific Highway Association is in session in this city. Boosting good roads is the battle cry of the delegates and much enthusiasm among the local and state authorities is being aroused by the session.

The concrete aim of the convention is to bring into reality the plan for a continuous highway along the coast from Canada to the City of Mexico. The delegates were welcomed by Lieutenant-Governor Wallace. John Brisben Walker, head of the California Automobile Association, spoke of the close interest of the Panama-Pacific exposition in the good road movement. Walker went deeply into the subject of road building, and declared that good roads eventually would solve the problem of high freight rates and with the use of motor trucks would offer the cheapest means of transportation between cities. He also declared that ideal roads would bring the cost of motor maintenance down to about one-tenth of what it is now.

A. B. Fletcher told of the work of the state highway commission during the past year. He said that his commission now has thirty-one survey parties in the field, and has, altogether, 260 people in its employ. He concluded his talk by saying that every effort is being made to finish the system before the exposition in 1915.

The annual report of President Ronald reviewed the work of the association for the past 3 years and urged the members to continue their work for a great Pacific coast highway. He explained that Pacific highway signs now have been posted along the route from the British Columbia line to Redding, in this state, and expressed the hope that funds would be forthcoming to continue the good work down to San Diego.

Monday evening the program was given over to two lectures, each being a first hand account of hazardous pathfinding trips taken by daring motorists who blazed the trail at each end of the proposed Pacific highway. The first was a talk by Chester Lawrence and T. J. Beaudet, who made the trip over the wild and nearly uncharted country between Los Angeles and Mexico City. The gold medal offered by the Pacific Highway Association for this feat was turned over to Lawrence by President Ronald, but the recipient promptly transferred the trophy to Beaudet, who drove the car on the trip.

The second talk was made by P. E. Sands, who drove a pathfinding car from Seattle to Hazelton, in British Columbia, near the Alaska line.

Absence of personal jealously and keen appreciation of the benefits from cooperation in furthering a public project were pointed out today by Thomas Taylor, minister of public works in British Columbia, as the causes of the success of highways of the northwest. British Columbia, according to Taylor, is a network of good roads, one province alone having 20,000 miles of highways, and 2,000 miles more are being added annually. He declared that no province received assistance from the government until it was known that the highways of that province were to conform with the general plan outlined for by other provinces.

This afternoon the resolution committee, among other resolutions, offered the suggestion that an executive officer be installed to patrol the Pacific highway and make an annual report to the convention of his findings.

On tomorrow, the last day of the convention, Thomas Taylor will again address the convention, as will Robert N. Lynch, of the California development board. In the afternoon the delegation will be the guests of San Mateo at a huge Spanish barbecue.

PLAN PITTSBURGH-PHILADELPHIA

Pittsburgh, Pa., Aug. 3—State Highway Commissioner Edward M. Bigelow and his engineers have completed plans for the improvement of the state highway between this city and Philadelphia. It is believed the work of the great pike will be completed by August of next year. According to Bigelow, the highway will be the equal of any in the country, with scenery that is unsurpassed by any in the United States. Much of the work is now under way, only a few days ago the contract for the work in Fulton county having been placed. This includes the work of crossing the Allegheny mountains, something like 14 miles from the west to the east foot.

The rest of the contracts will soon be let. The road will follow the old pike in its entirety. The job of following the old road is a gigantic and expensive one. There is one 7-mile stretch of sand deposit, where macadam will not do. This will be covered with asphalt or amasite.

The plan calls for a great park at the summit of the mountains between Somerset and Bedford counties. This will be known as Grandview. A turntable for cars will be made and timber cut so that an unobstructed view for 25 miles through the valleys can be enjoyed by tourists. The road in this vicinity is identical to that of the Forbes road laid out by General George Washington. Where Grandview park is to be located is the spot called Davie Lewis Lookout, which, according to history, is the place where Davie Lewis, a highwayman, awaited t pike to hold them up. I could see the roadway f this place. Stories of b this vicinity are also of s they will not down.

REPUBLIC INCREAS

Youngstown, O., Aug. 3 meeting held on August ers of the Republic Rubbe crease of the authorize $4,000,000 to $10,000,000. tensions and improvement and the semi-annual stat showing a large increase i the company. At the di following the board de stock dividend of 35 per mon stockholders of reco is stated also that an offe stock will be forthcoming The regular cash dividend per cent per quarter was the directors.

CHANGES IN THE

New York, Aug. 5—A g the N. A. A. M. will be e future, probably for the d ing at which the show all in October. The Motor Indianapolis and the War of Detroit have been el ship. The following ch made in representation: Ideal Motor Car Co., to s bier; Gleason Murphy, hicle Co., to succeed J. F. bins, Reliance Motor Tru A. M. Bently. W. C. Te the Ideal and Lucius F. W companies.

St. Louis has been drop show circuit, the dealers in the fall instead of o gested.

NEW YORK FIRE DEPA

New York, Aug. 5—T of the rules of the New ment has been made sinc little manual has been the department. There is mention of motor fire ap ing that such a large fr fighting machines install is composed of motor Among the rules specif the motor apparatus are

In section 34 it is orde pany commander shall chauffeur. Section 75 pr reports as to the effect of upon motors. Section member of the departm motor car not the proper

Points Out Flaws in the Patent Office

Commissioner Moore Declares Many Inventions Not Entitled to Recognition

WASHINGTON, D. C., Aug. 3—There are no industries in the country more vitally interested in the matters pertaining to the United States patent office than the motor car and accessory industries. To all those connected with these industries it will come as a distinct surprise that Commissioner of Patents E. B. Moore has come out with a statement to the effect that a large percentage of patents issued by the patent office should not be issued at all.

Commissioner Moore made this declaration in discussing the proposed investigation into the methods and personnel of the patent office. The investigation, which is contained in a resolution introduced in congress by Representative Bulkley, of Ohio, and published in Motor Age July 26, is what Commissioner Moore claims he has urged upon congress for 5 years.

Indorsing all the claims made by Representative Bulkley, as outlined in Motor Age at the time, as to the needs of the patent office and the evils which it is alleged exist in the department under his charge, Commissioner Moore said that half a million dollars would remedy every existing abuse and place the office on a modern business footing, under which the government could guarantee the novelty of every patent issued.

Commissioner Moore defended the men who work under him, but he admitted the truth of the statement that no sooner had a man been trained to some position with the patent office than he would move into some business for which his training had fitted him, and which paid him double and often treble the government salary. He declared the difficulty was not in getting good men, but in keeping them. "I would be delighted if congress would conduct the investigation which is proposed in the resolution presented by Representative Bulkley," said Commissioner Moore.

"I would not care to say 50 per cent, but a large percentage of the patents which are issued from this office are not good patents and should not be issued," continued the commissioner. "Yet what can one do under the condition with which we work? We have not the men or the equipment to conduct the searches, and it is only natural that a great deal should be overlooked, which would not be the case if we had the improvements for which I have asked during the past 5 years. If these things are granted to us, it would enable the patent office to make the search so thorough that the government would be able to guarantee at least the novelty of the patent, as is done by the German government. Then the patentee can be sure that his patent is at least original.

"One must not forget the fact that this office is self-sustaining. It is supported entirely by the inventors of the country. Judging from the receipts which we have taken in in the past 6 months, the surplus for 1912 will be close to $300,000. This is nearly the amount for which we ask to place the office under modern business conditions. And in the treasury of the United States there is a total of $7,000,000, which represents the net surpluses earned by the patent office since its beginning. We do not ask congress to give us money, but only to allow us the use of the money which we have earned."

The Bulkley resolution would have the investigation made by President Taft's economy and efficiency commission, which would be required to make a report of its findings before December 10, 1912.

DULL WEEK IN CRUDE RUBBER

New York, Aug. 6—Crude rubber experienced another dull, draggy week with prices about stationary and both buyers and sellers inactive. Importations aggregated a rather large total, the week-end receipts being 2,800 packages. The buying was placid and was reported to be for jobbing accounts. Reports have been circulated that the Brazilian syndicate has disposed of 650 tons of hard fine Para, about one-third of its holdings, selling in the London market. In the meantime, since July 1 the movement down the Amazon to Para is estimated at 1,600 tons. The big movement to market is probably accountable for the lack of eagerness on the part of buyers and the tremendous manufacturing consumption is said to be the main support under the market. While the bids and offers have been quietly made in practically all the markets, the total volume of trade has been satisfactory. The market has stood for a week around $1.16½ on a basis of up-river fine.

PALMER & SINGER OBJECT

New York, Aug. 6—According to Jay N. Emely, solicitor for the Palmer & Singer Mfg. Co., a motion will be made in the United States district court in the immediate future to vacate the order of Judge Hand providing for a decree pro confesso in the suit instituted last fall by the Enterprise Automobile Co. for alleged infringement of the Dyer patents. Mr. Emely asserts that the demurrer filed by him prior to the ruling of the court was not included in the presentation for decree pro confesso by the solicitors for the Enterprise Automobile Co., and the latter hold that the various postponements and delays which have occurred from time to time did not contemplate the filing of any demurrer.

it and requires all members to prevent person not a member of the department from riding on a department car. -veral of the rules provide for maining and caring for motor apparatus, there is nothing different in their lan-ge than in that applied to the horse-n engines.

TOURING THROUGH UTAH

lt Lake, Utah, Aug. 5—That 1912 be a record-breaking year for transnental touring is plainly evident by early rush of tourists to the coast. vanguard of the continual stream of hat is now daily passing through this appeared about a month ago. It sd its highest stage last week, when estimated at least 100 cars passed gh Utah. The Automobile Club of has opened a free touring bureau at ate street in this city, where it furtrip maps to these tourists and disfree information. A register is nd fifty tourists took advantage of portunity to leave their names and , where they were going, the make car and the average daily travel

OSSMAN PLEA WITHDRAWN

York, Aug. 5—In the suit of Rose . against Emil Grossman and oth-plea made by Charles Gill, solicitor defendant, has been withdrawn and file an answer on the September has been granted. The suit in he validity of the Neverout license lder patent held by the Rose com-he plea that had been entered by was that the claims set out in the had already been adjudicated. is now withdrawn and an answer material allegations will be filed.

CK CONCERN IN TROUBLE

ork, Aug. 6—Involuntary bankceedings have been instituted in d States district court against the ayton Automobile Co., which rucks in New York. The liabilitimated at $10,000 and the assets at amount. Spencer E. Wishart, nown race driver, was formerly with the embarrassed concern.

O TRUCK IN WYOMING

Wyo., Aug. 5—Road and weather in this section of the country the transcontinental Alco truck t 2 days more. With roads subler 2 feet of water, and several the west washed out travel is for touring cars, let alone a moaden with a cargo of freight. e are that repeated rainstorms for a week have washed out a road track.

Routes and Touring Information

DECATUR, ILL.—BOWLING GREEN, KY.

DECATUR, Ill.—Editor Motor Age—Please advise me the best route from Decatur, Ill., to Bowling Green, Ky., via Indianapolis.—Road Bug.

This should make a very delightful 3 days' trip, covering 173 miles the first day, stopping for the night at Indianapolis, 124 miles the second day, with the night's control Louisville, and a journey of 151 miles the third day.

After leaving the gravel road which stretches out for a distance from Decatur, natural dirt road, which is mostly good, continues to near Terre Haute, where gravel is again found. You should pass through Antioch, La Place, Lovington, Chesterville, Arcola, Oakland and Paris. From Terre Haute to Indianapolis will be found good gravel or stone road all the way via Brazil, Reelsville, Coatsville, Mount Meridian and Plainfield. Half a mile beyond Coatsville watch for right and left turns across an iron bridge, continuing with the trolley poles. Going south from the Hoosier capital you will have good gravel all the way to Louisville, passing through Whiteland, Franklin, Amity, Taylorville, Columbus, Waynesville, Jonesboro, Seymour, Crothersville, Scottsburg, Henryville, Sellersville and New Albany. About 8 miles beyond Scottsburg, after winding through the woods, you should come to a small ford, and a quarter of a mile out from New Albany look out for a sharp right upgrade across the trolley and an immediate turn to the left.

The remainder of your journey will be over the old Louisville and Nashville turnpike, in which great interest has been taken of late and much work done upon the road which will probably be found in pretty good shape, although Motor Age is not in position to say in what condition it will be found. It is a highway as rich in history as in natural beauty. Passing through Mount Washington, Bardstown, New Haven, Buffalo, Canmer, Bear Wallow and Cave City will bring you to Mammoth Cave and Colossal Cavern with their wonders of underground chambers and passages, peculiar geological formations and strange acoustics. Leaving Mammoth Cave over the same road by which you entered the town, a trifle over a quarter of a mile out, cross the railroad and turn immediately to the right. At Glasgow Junction turn to the right, soon crossing the railroad, then be cautioned for sharp left turn going under the railroad and a couple of miles farther on go through a covered bridge, thence into Bowling Green.

ROAD NEAR POCONO LAKE, PA.

MACKINAC ISLAND'S NEEDS

Detroit, Mich.—Editor Motor Age—It is one of the inconsistencies of the present day that in modern summer resorts antiquated means of transportation should be the only permissible one. The motor industry had a glaring example of this during the recent visit to Mackinaw island, where 400 spent 6 or 8 hours. In this island, with a circumference of 9 miles or thereabouts, there are many of the prettiest drives imaginable and yet the motor vehicle is barred, the only means of transportation being slow, dusty, fetid horse vehicles. Not only are the means of transportation slow but the roads are swathed in clouds of dust. It is to be regretted that a point of such historic interest to the entire country, and part of which is now a national park, should be kept in such a backward condition. The roads should be oiled and motor vehicles permitted. It would be necessary to have all vehicles travel in one direction only and limit the speed to 15 miles per hour. With such
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o Council Bluffs via
You can either cross

City some of the places touched will be Olathe, Wellsville, Ottawa, Garnett, Colony, Iola and Humboldt to reach Chanute; continuing to the south you will reach Galesburg; then turning west to Fredonia. Then your best route, as you suggest, will be to retrace to Ottawa, where you will strike the Santa Fe trail, which will take you to Newton. The wayside towns on this section of the route will be Williamsburg, Waverly, Emporia, Cottonwood Falls, Elmdale, Clements, Florence and Peabody. You should continue on the Santa Fe trail beyond Newton through Halsted, Burton, Hutchinson, Nickerson, Sterling, Lyons and Chase to Ellinwood. Turning north onto the Sunflower trail, this road will take you to Claflin, Wilson, Sylvan Grove, Denmark, Victor, Beloit, Glen Elder, Downs, Portis, Smith Center, Reamsville and Franklin. Bloomington is but a short distance west of Franklin. To reach Lexington, return to Franklin, then continue north on the Sunflower trail through Macon, Minden and Newark to Kearney, thence west over the Platte Valley route through Elm Creek to Lexington.

To reach Fort Morgan, as suggested in a former letter, continue westward from Lexington via Willow Island, Gothenburg, Maxwell, North Platte, Sutherland, Paxton, Ogalalla, Brule Station, Julesburg, Sedgwick, Proctor, Sterling, Merina Station and Brush to Fort Morgan.

To return via Omaha and Storm Lake you should retrace to Kearney and continue

D MILL ON LEHIGH RIVER NEAR STODDARTSVILLE, PA.

Late Road Reports for the Mot

THE Touring Club of America reports that the historic Newburyport turnpike is in good condition and by its use much time and 14 miles are saved on the route from Boston to Newburyport and Portsmouth.

Leaving Boston via Massachusetts avenue this route goes over Harvard bridge, turning right at Central Square, Cambridge; then along Prospect street until Cambridge street is reached, then turn sharp left, going to Springfield street, through Concord Square and Newton street onto Prospect street again, thence to Union square. This detour is necessitated by road improvements on Prospect street. Cross Union square turning right on Walnut street. Bear right on Chauncy street, passing Broadway park on the right, and into the Felsway. Thence to Revere Beach parkway; to Broadway, Everett, which follow straight ahead through Everett, Malden, Melrose, etc., to Newburyport. At the fork of the roads in Malden pass the electric car barns on the right, being sure to take the left-hand fork of the road.

Brighton to Flint via Fenton is a new route with considerable gravel, although there are a few short stretches of sand and a little clay, none of which is very bad. This is a useful route on the direct line between Toledo and Flint.

Flint to Grand Rapids via St. Johns and Ionia is also new. Like most other roads in this section of Michigan, this is a mixture of some good gravel and a few stretches of clay. It is not bad at any time, however.

From Lansing to Mt. Pleasant it is good gravel to St. Louis, where this route connects with the new route between Saginaw and Cadillac. It is also gravel practically the remaining distance into Mt. Pleasant.

From Mt. Pleasant to Big Rapids is a mixture of gravel and clay with some sand; fairly good route.

A new route is from Cadillac to Grand Rapids via Evart, Barryton, Remus, Lakeview, Greenville and Rockford. This parallels route 788 but is considerably east and has gravel practically all the way, the Blue Book car going over this in a terrific rain storm. Practically the only exception to gravel is a little sand and a short stretch of old corduroy between Remus and Barryton.

Grand Rapids to Lansing via Ionia and Portland is fairly good gravel most of the way. Some spots are soft with a little dirt.

Ionia to Kalamazoo via Lake Odessa and Hastings is fairly good road with a mixture of gravel and considerable dirt. There is some sand south of Hastings.

From Kalamazoo to Ft. Wayne there is good gravel to Vicksburg. From there to Sturgis it is only fair with some sand not bad at any time. It is fine gravel from Sturgis to Ft. Wayne.

Ft. Wayne to Wabash. The regular route to Huntington was found to
and for this year the present
will continue to be the only
1913 a new route through La
but this is closed now due to

Wabash to Goshen via
fine gravel all the way.

Goshen to Plymouth. This
considerable sand to Bremen
from there to Plymouth.

Due to the bridge over th
being out on Madison street
Chicago to Lombard, Genev
advised to jog north on Aus
of south, then west on La
Oak Park and River Forest
Maywood, where turn left,
western tracks and immedi
St. Charles road, following re
route 27 from there on.

The Around-the-Bay rout
cisco to Oakland via Palo A
San Jose is in excellent co
Fresno to 'Frisco via Mer
Livermore.

A suggestion for motor
Joaquin valley is to start ea
in the morning, making a ru
then rest, resuming the d
6:30 for another 4 or 5 hou
ule saves both the car and
the excessive heat and gla
sun.

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on the Platte Valley route through Shelton, Wood River, Grand Island, Chapman, Central City, Clarks, Columbia, Benton, Schuyler, Ames, Fremont, Waterloo and Elkhorn to Omaha. Crossing to Council Bluffs, turn north and pass through Crescent, Missouri Valley, Woodbine, Dunlap, Arion, Denison, Kiron and Odebolt to Storm Lake. You are doubtless familiar with the remainder of the trip through Sulphur Springs, Newell, Fonda, Pomeroy and Matson to Fort Dodge.

CHILLICOTHE TO COLORADO SPRINGS

Shelbina, Mo.—Editor Motor Age—I am contemplating a trip to Colorado Springs in a short time and would like the best route from Chillicothe, Mo., to that city.—W. H. White.

Follow the new Hannibal and St. Joe cross-state highway over good roads to Utica, Mooresville, Breckenridge, Hamilton, Cameron, Plattsburg, southwest 2 miles to the Interstate trail to Kansas City. It is marked straight south into Kansas City over the new bridge and the towns through which it passes need not be enumerated. The poles are marked with blue and white bands.

Two different routes are offered you in crossing Kansas, one called the Golden Belt line and the other the Santa Fe trail, which is the longer. The trail generally is preferred not only on account of its historic connection, but the hotel and garage accommodations are superior for the reason that larger towns are touched. The trail leaves Kansas City for Westmoreland, Martin City, Olathe, Gardner, Edgerton, Ottawa, Williamsburg, Silkville, Waverly and Emporia, 134 miles; and continues to Hutchinson, 122 miles, through Plymouth, Saffordville, Ellinor, Cottonwood Falls, Elmdale, Clements, Cedar Point, Florence, Peabody, Newton, Halstead and Burrton. From Hutchinson to Colorado Springs the
in another communicatic
from Corpus Christi.

FALLS IN LEHIGH RIVER NEAR STODDARTSVILLE, PA.

BATON ROUGE-CHATTA

Baton Rouge, La.—Ed
—I am thinking of maki
car from this point
Tenn. Kindly give me
road conditions, distanc
Reymond.

The more direct route
connect southern Louisi
phis is that which passes
burg, Kentwood, Osyk
Beauregard Station, Ha
Springs, to Jackson, th
179 miles, which would
first day's run. The it
day might be Tougaloo,
stadt, Canton, Pickens,
lin, Lexington, Greenwo
Sumner, covering 165
improvements are bein
route north from Baton
well to make inquiries a
some detours may be
ning north from Sumne
distance of 120 miles, th
via Clarksdale, Cloverhi
homa, Rich, Dundee, Cla

Turning east from M
important wayside place
miles will be Germant
Moscow, LaGrange,
Saulsbury, Rogers
Springs, Corinth, Burns
okee, Barton and Tusc
portion of the road is
it parallels the railroa
ton, Town Creek, Co
Hillsboro, Trinity to H
point on the towns pa
Huntsville, Mayfield,
kinsville, Scottsboro,
port, Jasper, Rankin
point you will cross th

by ferry—and then a run of 20 miles brings you into Chattanooga, the total mileage for the day being in the neighborhood of 190 miles.

CORPUS CHRISTI TO DENVER

Corpus Christi, Tex.—Editor Motor Age—Please tell me how I can obtain a route map or plan showing the best roads between Corpus Christi and Colorado Springs and Denver, Colo.—N. Hale.

After crossing the Nueces river by ferry, with which arrangement doubtless you are familiar, as perhaps with the entire distance to San Antonio, pass through Sinton, Beeville, Karnes City and Floresville, which affords a good motor road nearly all the way. Leaving San Antonio, proceed through New Braunfels, San Marcos, Austin, Round Rock, Georgetown, Granger, Temple, Eddy, Lorena, Waco, Hillsboro, Cleburne to Fort Worth, which perhaps would be your second night's control with Austin the first. Going west from Fort Worth through Benbrook and Weatherford, at the latter place you will strike the Chisholm trail which should be followed through Jacksboro, Windthorst and Wichita Falls, crossing the Red river by a substantial bridge into Oklahoma. This is the only available crossing of the Red river for you.

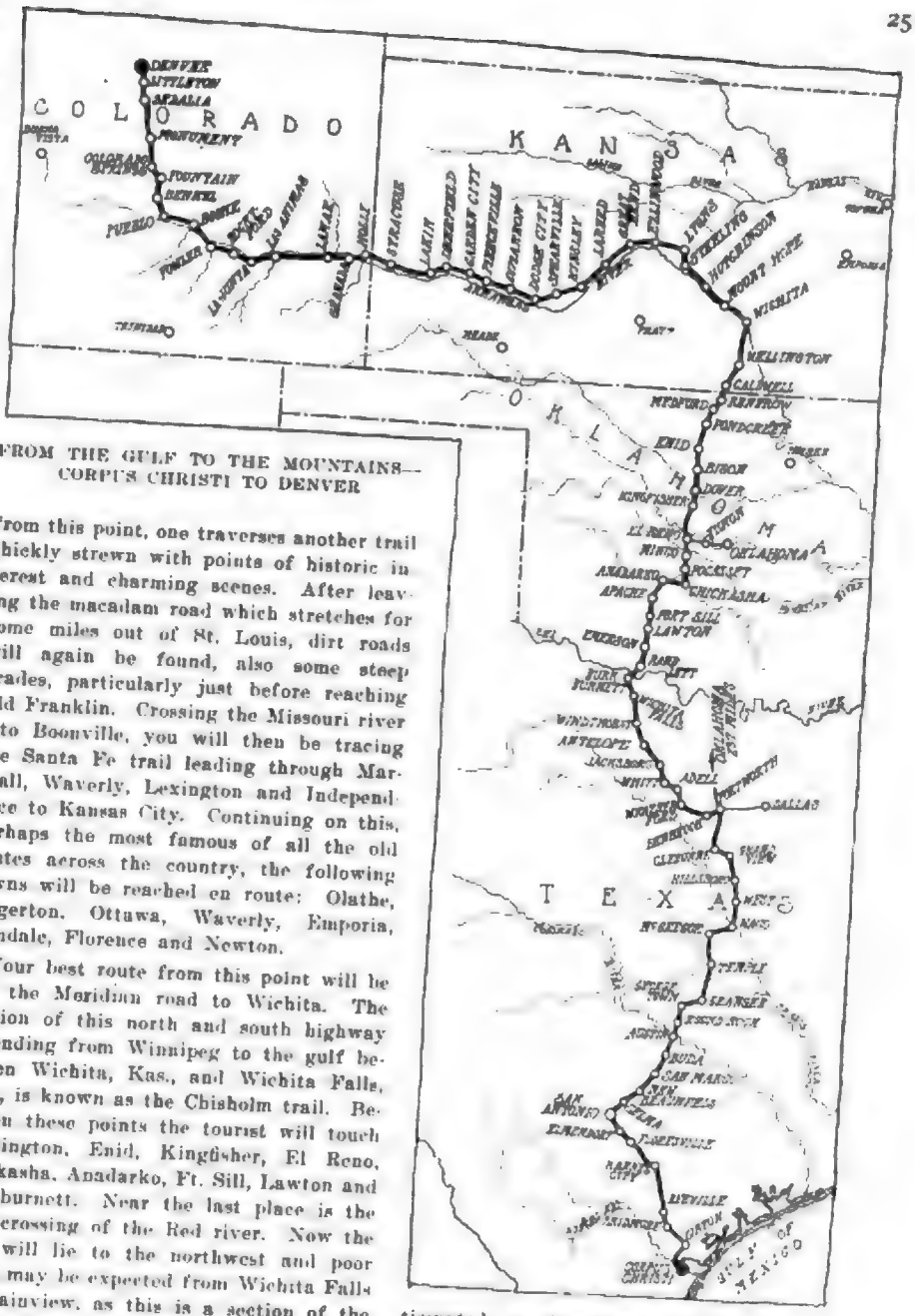
In Oklahoma towns enroute are Lawton, Fort Sill, Anadarko, Chickasha, El Reno, Kingfisher, Enid and Medford. Chickasha may be the stopping place the third night, making the day's run about 211 miles. From Medford soon passing into Kansas via Caldwell to Wichita, and from this point bearing to the northwest, at Hutchinson you will reach the Santa Fe trail. This historic trail follows the valley of the Arkansas river. Some of the principal wayside points are Sterling, Lyons, Ellinwood, Great Bend, Larned, Kinsley, Dodge City, Garden City, Syracuse, and again crossing a state line, proceed through Holly, Lamar, Rockyford and LaJunta to Pueblo, thence north to Colorado Springs and Denver.

OHIO TO TEXAS

Trinway, O.—Editor Motor Age—We are contemplating a trip to Plainview, Tex., starting the first or middle of September. We should like to have details on the best route from Columbus, O. The National highway to Newton, Kan., is the one we prefer as to latitude.—Subscriber.

It probably will be desirable to connect with the National highway at Zanesville, following this historic road west through Columbus to Springfield, Vandalia and Richmond; or, from Springfield via Dayton and Eaton, returning to the National highway, mostly natural dirt road, leads thence to Greenfield, Indianapolis and Terre Haute, having good gravel, macadam or stone road all the way.

Leaving Terre Haute and the National highway mostly natural dirt road leads the motorist through Effingham and Vandalia, Ill., to St. Louis, Mo. Going west



FROM THE GULF TO THE MOUNTAINS—CORPUS CHRISTI TO DENVER

from this point, one traverses another trail thickly strewn with points of historic interest and charming scenes. After leaving the macadam road which stretches for some miles out of St. Louis, dirt roads will again be found, also some steep grades, particularly just before reaching Old Franklin. Crossing the Missouri river into Boonville, you will then be tracing the Santa Fe trail leading through Marshall, Waverly, Lexington and Independence to Kansas City. Continuing on this, perhaps the most famous of all the old routes across the country, the following towns will be reached en route: Olathe, Edgerton, Ottawa, Waverly, Emporia, Elmdale, Florence and Newton.

Your best route from this point will be via the Meridian road to Wichita. The section of this north and south highway extending from Winnipeg to the gulf between Wichita, Kas., and Wichita Falls, Tex., is known as the Chisholm trail. Between these points the tourist will touch Wellington, Enid, Kingfisher, El Reno, Chickasha, Anadarko, Ft. Sill, Lawton and Burkburnett. Near the last place is the best crossing of the Red river. Now the way will lie to the northwest and poor roads may be expected from Wichita Falls to Plainview, as this is a section of the state in which the highways are not of the improved type. The towns along the way are Iowa Park, Electra, Harold, Oklaunion, Vernon, Tolbert, Chillicothe, Danish, Quanah, Acme, Goodlet, Kirkland, Childress, Carey, Estelline, Newland, Memphis, Rowe, Lelia Lake, Clarendon and Amarillo.

Some bad stretches of sand will be found, and especially rough traveling between Acme and Leila Lake. However, this route is preferable to that branching from the Santa Fe trail at Dodge City that would take you by what is called the Colmar cut-off through Liberal, Kas., southwesterly to Amarillo, thence south to Plainview. Bad river crossings and quicksand are liable to be encountered on this route.

It would not be unwise to carry some strips of canvas to be used on the sandy stretches. Although troubles may be anticipated on the latter portion of your journey, on the whole it should be a very interesting and enjoyable trip.

NEBRASKA INTO IOWA

Ohiowa, Neb.—Editor Motor Age—Kindly give me the best route from here to Storm Lake, Iowa.—Cy McFarland.

Motoring to Strang you should turn north onto the Meridian highway which will take you through Geneva and Fairmont. Now your way is eastward over the Transcontinental highway leading through Exeter, Friend, Milford, Emerald, Lincoln, Havelock, Waverly, Ashland, Gretna and Millard to Omaha. Crossing the Missouri river to Council Bluffs proceed via Crescent, Loveland, Missouri Valley, Logan, Woodbine, Dunlap, Dow City, Arion, Denison, Deloit, Kiron, Odebolt, Shaler, to Storm Lake. The route outlined above is the most direct between the points designated.

Some Old Racing Cars

What Becomes of Superannuated Special Speedsters—History of Drivers and Mounts

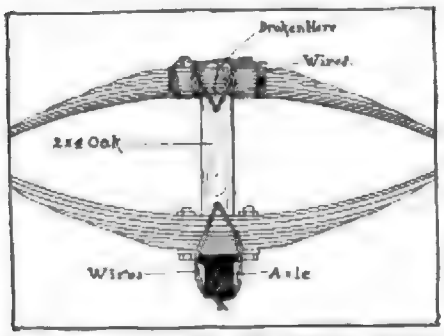


FIG. 1—INGENIOUS TEMPORARY SPRING REPAIR

NEW Orleans, La.—Editor Motor Age—What became of the Winton Bullet that went through the fence at Cleveland in 1905? What was its horsepower? Was it chain driven? If it is still in use will Motor Age give me the address of the owner?

2—What is the make of the 300-horsepower motor car that P. Bordino drove at Saltburn-by-the-Sea when he traveled 116.13 miles in 60 minutes?

3.—What became of the Fiat Strang drove at Atlanta? What is its horsepower, and how many cylinders has it? What is the address of the owner.

4—What was the horsepower of the Peerless Green Dragon? How many cylinders did it have? Was it chain or shaft driven? Is it true that it was wrecked? If so, how? If not, please give me the address of the present owner.

5—Who bought the Frayer-Miller motor cars used in the 1907 Vanderbilt cup race? What are the addresses of the present owners? What were the prices paid for these cars?

6—What became of Jimmy Ryall and the Matheson that he drove at New Orleans, La., about 4 years ago? What was its horsepower? How many cylinders did it have? Was it chain-driven? What year and model was it? If it is in use now, give me the address of the present owner.

7—Will Motor Age publish special show issues as in the past?

8—In what book and what issue can I find the pictures of the above named racing cars?—F. Kelly.

1—Following the accident to Earl Kiser at Cleveland in 1905, the Winton company retired from racing and the old Bullet now is reposing in the factory museum at Cleveland. The car was an eight-cylinder of 96 horsepower.

2—The car Bordino drove in the English trial was a Fiat. However, it did not go 116.13 miles in 1 hour; it traveled ½ mile at that pace.

3—Louis Disbrow has the motor of the Strang Fiat and is using it in his Jay-Eye-See. It is a four-cylinder and is commonly spoken of as of 300 horsepower.

4—The Peerless Green Dragon Oldfield used to drive is of 60 horsepower, a four-cylinder and shaft drive. The manager of the Chicago Peerless branch states that it is owned by a motorist in New York state, just who he does not know. He saw the car as late as last winter but was not sufficiently interested to ask who had bought it.

5—Motor Age does not know.

6—Ryall no longer is a racing driver. Motor Age cannot answer the other part of the question.

7—That is the present intention.

8—If you have files of Motor Age dating 5 or 6 years back, doubtless you will be able to find pictures of the cars referred to above.

AGENT IN ERROR

Denver, Colo.—Editor Motor Age—The agent for the Haynes motor car here says that owing to a peculiar construction of the cam, the throttle may be opened wide instantly without the motor choking or dying down when overfed as is the case in most cars. This I witnessed myself in the shop where the motor had been dead for hours standing in normal garage temperature. What is the reason? How do experts figure gas engine cylinder clearance? Is there any rule for this or is it a matter of opinion?—A. W. Daniels.

The older models of Haynes cars, such as the model S, due to their small valves and relatively heavy springs, will not choke when suddenly accelerated, if the carbureter is in proper adjustment; the size of the inlet valves being such, and their closing being so positive, that they will not admit an overcharge. In the newer models, however, with their large valves and proportionately light springs; the engine is very sensitive to over-acceleration. To prevent the choking up of the motor when the throttle is opened too suddenly, small port area and a perfectly adjusted carbureter are essential, and this result, if attained, is of doubtful value, as a fully opened throttle should deliver a high-speed mixture, and if the mixture delivered with a wide-open throttle is used in a slow-running motor without misfiring, it does not speak well for the high-speed mixture, and it is doubtful if full efficiency is being obtained from the engine. The cam construction can have no possible effect on this behavior. Such an idea is an absurdity.

The Reac

Historical Notes of Former Speed Monsters and Freedom of Early Haynes Models from Cho Valve and Not Cam Construction—Sprin

Roadside Sp

How a Clever Dri Mended Br Suspe

SAUK CENTER, Age—I was calle broken spring the ot broken off in the bol being broken. The at the place mentione as is possible with get a chance to wrap it, but this could not now under treatmen I patched it up: I 4-inch oak and saw length to go on the leaves which were n der the break, boring end of the spring ha was not broken and rested under the bro bored a ½-inch hole 2 by 4 through the t a piece of telepho sides of each end and passed it thro making it fast by the wire onto the s not broken, and wh clamps which held clip. We then raise car up sufficiently t to their normal po was made fast to around the axle of ends as with the o the parts rested, m job which would any distance. As there was not muc rangement but a jar over rough plac a moment's trouble traveled—33 miles— out at the end of t

The trick of the get the 2 by 4 the to allow the broken rated and pull out them when unbroke let the whole side c chassis to list so other springs to bre perhaps part of th able or possibly in sketch of the way which may be of us

Clearing House

Question of Power and Economy of Two-Stroke Principle Taken up by Readers—Value of Crankcase Compression in Four-Cycle Motor—Engine Will Not Throttle Down

Cause of Inflexibility

Carbureter Adjustment at Fault—Mixture Is Too Weak for Running on Low Speeds

CENTRALIA, MO.—Editor Motor Age—What is the matter with an engine that misses on low speed and works fine on high and intermediate? Change the carbureter and it will work perfectly on low but not on high. Have used both the models E and L, Schebler carbureter, and results are the same. I use a battery and Splitdorf magneto and the spark is fine. The spark is always hot and perfect, whether running on battery or magneto. The engine is Jackson 5 by 5 inch cylinder with 1¼-inch Schebler carbureter. Is this carbureter large enough?—O. B. Mayes.

1—Your trouble is with your carbureter adjustment as you have guessed, the mixture being correct for intermediate to high speeds, but too lean for low speeds. In your readjustments you have probably enriched the mixture at all speeds, spoiling your high-speed mixture by making it over rich. The Schebler model L is recommended for this size of motor, and with at least a 1½ inch outlet. Your carbureter shows lack of flexibility which may be the result of: 1—Too small size, giving an insufficient volume of air at high speeds, when properly adjusted for low; 2—Improper adjustment of air, the spring being too weak, allowing an excessive opening at low speeds; or your spring may be stiff, allowing insufficient air at high speeds when right for low; 3—Your nozzle opening may be too small, giving the proper proportion of gasoline for high speeds, but insufficient for low speeds, when properly adjusted for high and intermediate.

The best guide to determine which of these faults obtains is to adjust the motor for the best performance at high speeds, throttling down to medium, then adjusting it to the notches on the adjustments which previous experiment determined as best for low speeds, noting if any difference in the performance takes place in the speed of the motor at the fixed throttle and spark position for medium speed. If the motor shows better speed in the first position, you may know that this is the normal adjustment, and that your trouble is with the low-speed adjustment. If, to the contrary, intermediate speeds are improved by the change to low speed adjustment, your high-speed adjustment is wrong. The medium speed is the criterion at all times, and what is best for normal running is best for the whole range. It being determined that the low speed is at fault, place the hand partially over the air intake and observe whether there is any improvement in the behavior of the motor. If so, be assured that your air valve opens too far on low speeds. If not, your nozzle must be too small. If the medium speeds favor the low-speed adjustment, on the other hand, try forcibly opening the air valve at high speeds. If this improves the speed, the air valve is too tight, or the carbureter is too small. If the former, on medium speeds, opening the air valve should cause it to speed up. If the latter, the motor must show a deficiency of power on an open throttle. There is no way to positively determine this trouble but careful experiment, supplemented by the advice of the maker.

CADILLAC QUERIES

Wilmington, N. C.—Editor Motor Age—What is the gear ratio of the 1912 Cadillac on high?

2—What is the speed of the car?

3—The weight fully equipped?—W. E. W.

1—The 1912 Cadillac is geared 3.66 to 1, on high.

2—Fifty to 55 miles per hour, with standard gearing and equipment is claimed for this car by the maker.

3—The weight of this car is approximately 3,500 pounds with full equipment and full tanks.

Two or Four Cycles?

New Yorker Disagrees With C. E. Duryea as to Relative Merits of Types of Engines

NEW YORK—Editor Motor Age—In reply to Mr. Duryea in regard to two-cycle engines, Mr. Duryea says, "Assuming that the ignition begins at the dead center, although in many cases the heat has not developed nor the pressure risen until somewhat later——" I would like to know, asking as one who looks for the better vision, whether, if the ignition occurs at any other point than the center, as Mr. Duryea here asserts, the maximum compression pressure and the maximum heat wave do not coincide? I would appreciate a little more detail on that matter. I have never even suspected that there was a lag or lead considering the compression and heat development phenomena. I have observed, however, as I have mentioned elsewhere, that the maximum compression pressure does not coincide with the smallest volume—topmost piston position—but on a very slow speed. I have invited discussion on that point, but, to my chagrin, not one picked up the gauntlet.

I must say here that, unfortunately, the same tendency which permits the American to sit down and enjoy a game played by others—say baseball—instead of participating, taking his enjoyment as a player and not as a fan, makes him sit back, waiting for someone else but himself to do the fighting, the arguing about the correctness of this or that view. What are Mr. Duryea's actual observations on the reported difference between heat and compression? Are his conclusions theoretical, or have they been original deductions, but later verified? What permitted him to form his original deduction, if such is the case? What led up to it? or, to say it in a more homely manner—which the straws indicating the direction of the wind?

At this moment my observations are based upon the four-cycle engine, although

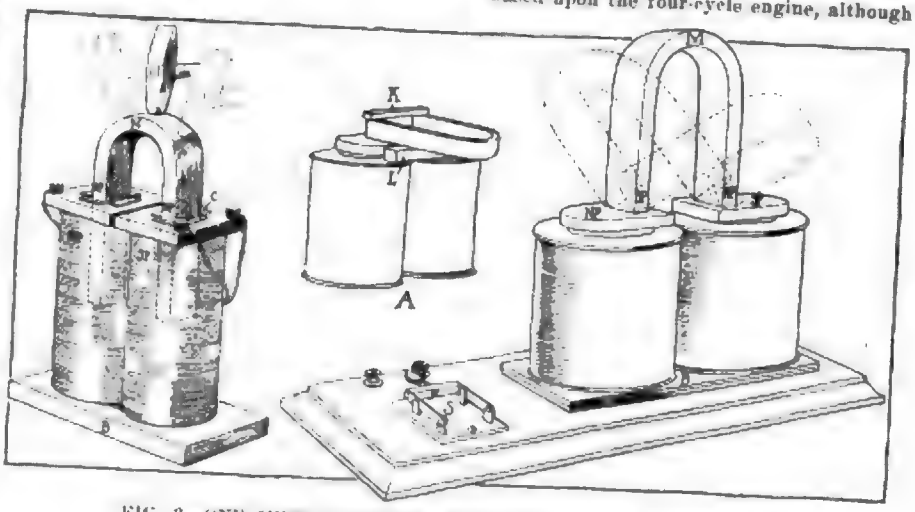


FIG. 2—ONE METHOD OF RECHARGING MAGNETO MAGNETS

my engine differs from his in several things. As far as compression is concerned, there ought to be very little difference in phenomena. Indicator cards do not show a lagging compression wave; but I do not think the indicator a very reliable instrument; I think it too slow. I believe a fast moving film, a ray of light and a deflector would give us some insight and permit us some checking up of our several views on the cycle.

For Mr. Duryea to say, in speaking of the four-cycle engine, that "this is not a real good pump," leaves me wondering whether he takes the public seriously when he so says. Can he point to a better one, even in theory? All suction pumps of the highest order are piston pumps, the only exception being "mercury pumps used for very high vacua." For him to say that those fill not at high speed, tempts me to ask him if he expects a 100 per cent efficiency. What I do believe he calls for, although he does not say so, is that designers ought to produce engines with a greater volumetric efficiency than heretofore obtained. That this is easily done I have observed when dispensing with manifold and carbureter. Add to this greater valve area—theoretically the piston and valve diameter ought to be the same—by using but one valve; then leave the incoming fluid cool, and no further increase in volumetric efficiency can be had in a conventional four-cycle engine at this writing.

But how about the two-cycle, Mr. Duryea—the engine of your choosing When you assert that a cylinder and piston device, such as any of the mentioned engines are, cannot pump as well below the piston as above, you, a designer, do not mean to tell me that you could not at a moment's notice produce an engine that does have, say, 50 pounds compression below the piston—in the crankcase, for example?

As I stated before, all my observations are based upon the four-cycle, and I therefore do not know whether or not 50 pounds precompression is advisable; but, little hampered by orthodox views, upon first blush I say it is feasible. It is surely so if the action of the exhaust is similar to that of the four-cycle, an action which I cannot yet fully understand, for the reason that my conclusions differ a great deal for accepted views. So much so, indeed, that a new class of engines whose action is based upon a cycle not yet known will appear in the near future. I will not predict that I will bring it forth, although I am striving now to get enough clearness of vision to allow me to proceed; but I know that many others are now working on similar lines and but one will be heralded the winner.

Judging from this angle, I do appreciate the condemnation of Mr. Wall; we want better engines, not more gears. A few months ago I went with a customer to buy a pipe-threading machine, and, describing the virtues of his machines, the master mechanic pointed with pride to the change-gear device he had. He explained that this was the source of his power. When I attempted to show him the error of his way, that gears made not for power, it took all my ingenuity to withdraw in good standing. My client was a listener to the dispute and was tempted to throw me over as an ass—so he admitted later. But a week later my man asked me for the loan of a 15-horsepower motor to drive a pump. "Sorry," I said, "but the largest I have is a 10-horsepower." "No," came back his reply, "that will not do; it is not powerful enough." "Why, that is easy; borrow a few of those gears of your friend who makes pipe machines," I said. Mr. Wall is right when he says that although several sets of gears are there, the average man does not use them. We want better engines, and that is the sole purpose of my lines.

Addressing, as I am, "an old-timer," and speaking of a subject bearing on engines, can Mr. Duryea tell me why the hot tube in universal use a little over 10 years ago has fallen into disuse? At that time all engines fired by means of the hot tube. I have lately returned to it, to find it superior to the electric ignition devices of all kinds. What I cannot do with the spark plug I can do with the hot tube, and, what is more, it is simplicity itself.

At this writing, I take a common four-cycle engine provided with a hot tube, and use crude oil as a fuel and start the engine cold at ½ minute's notice. The engine runs well, controls well. A single-cylinder engine I run as low as 190 revolutions per minute and as fast as 1,500 revolutions per minute, and could run it faster if necessary. I am using an open flame at this writing for the first 5 minutes only; after that the engine will take care of itself. Of course, it can be done better without an open flame, using a hot tube, but—Rome was not built in a day. In conclusion, I will say that my engine is not cooled, but is insulated by the air in the empty waterjacket; that although its running temperature perhaps is twice as high as that of other engines, no troubles have developed.—P. G. Tismer.

Duryea Idea

Value of Crankcas as Cushion to Red Blow of P

DETROIT, Mich.—Ec I would like to giv little experience I had a support of what Charles say in Motor Age, July value of crankcase comp of balance or cushion t mer-blow effect of the in an internal combusti

I was testing out a c without passengers, equ cylinder four-cycle mot inches, but which use pression of air to swee their burned gases af and also to augment th

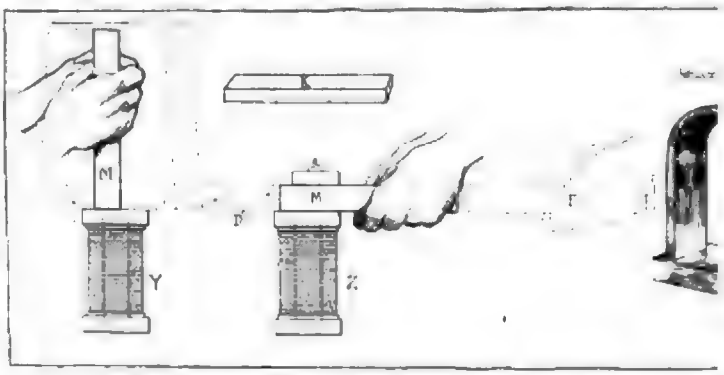


FIG. 3—TWO ARRANGEMENTS FOR MAGNETO RECHA

an auxiliary means t power of the motor fro better than 80 H. P. it was discovered all car shot over the crest power shut off, it soun would surely go to pie who had charge of the have to ship the car ba it was an experimental it would be impossibl in that condition. H gave in to what he tho about the floating pis rod and which was I myself, but just as soo applied there was no k to his surprise, we co in very fast time, tr miles per hour wherev permit, and when th newed, the shaft had at all, though the b play.

This to me was co the value of cranke used for no other pur the hammer-blow of parts, it would be well ever, there are other tures about the use of sion in combination w gine other than the which it gives.—M. C.

Recharge the Magnets

·ation Not Recommended for y but Experts—Outfit Is lustrated and Described

LBY, Mont.—Editor, Motor Age—ow may a magneto magnet be remag- ? How strong a current should be Explain fully whether current goes h magnet or whether the latter is with wire.—Tobias Johnson.

process has been fully explained in Age four or five times in previous but as it is so frequently asked, it e of general interest. In Fig. 3 n the simplest way in which to tize a magnet, which will do very torily if only one or two jobs are ne. This method consists of wind- leg of the magnet with insulated vire, the strength of the magnet- depending upon the number of assing a strong direct current it. The best source of current dinary ignition storage cell. A t connection should be made to of the battery and the other bed over the opposite terminal, No permanent connection should with this wire because of the the battery in short circuiting 't iron keeper placed across the the magnet will determine the of the magnetization.

more exact energizing of the s desired, special devices may f which there are two types in e, shown in Fig. 2. They are hat both use two cores of und with insulated wire in directons, to differentiate by the different direction of per ends of the winding are some source of direct cur- the lighting circuit. The ire and the number of turns urse, on the size and resist- ore, and on the strength of For 110 volt direct currents, ed turns of No. 18 wire is ved. The two types differ constructed with a project- which the magnet is rocked magnetization, the other inding extend above the core, the magnet being set down within it a distance of about 2 inches, through a copper cap, C.

In operation, the most important step, and the first, is common to both instruments. It consists of determining that the north pole of the magnet is placed over the south pole of the core, as, if this relation is reversed, the time of charging will be greatly lengthened, due to the opposition of the magnetism in the magnet to that of the core. It is of prime importance that the polarity of the magnet be retained as it was originally. To this end, in removing the magnet from the machine, the polarity should be definitely determined, and the pole ends properly marked. The polarity of the coil may be determined by the use of a compass or by holding the magnet over one of its pole-pieces. Positive poles repel positives, and attract negatives.

The next step in using the device with the hollow core is to place the legs of the magnet in the device as shown, gently tapping the magnet with a hammer in each hand. This tapping should be continued for about 1½ minutes, after which the magnet is left in position for another ½ minute, the magnet removed, and a soft iron keeper placed over it immediately.

In using the other outfit, the magnet is placed with the poles opposed and rocked as shown for about 1 minute. It is then laid upon its side, pointing away from the operator, then reversed to point towards the operator. The final operation is shown in A, of Fig. 2, the keeper, K, being placed across the poles, and the magnet withdrawn. This operation requires about 1½ minutes. Another method consists, as shown in Fig. 3, of first, placing the poles of the magnet in proper relation to the poles of the electro-magnets, and brushing it across the latter from five to twenty times. Then the magnet is placed across the coils, with the bend close to the magnets, and the ends protruding beyond the pole-pieces. It should then be rocked over until the pole-pieces are in the position Y, and swung right over until the magnet assumes the position D. This will bring the opposite edges of the magnet M into contact with the electromagnet. In this position it should be rubbed back and forth until this side of the magnet is thoroughly saturated, when it is again rocked over the position D to position Z, the rubbing operation being repeated. This should thoroughly magnetize the magnet, and, after resting in position Z for a few minutes, should be bridged with the keeper K, and slid off the coils as in E. The keeper should be retained on the magnet until it is in contact with the pole-pieces which constitute the base of the magneto.

This is no job for a novice, however, and should not be attempted without experience in this kind of work. The best way is to send the magneto to the factory or a branch.

NOTICE TO READERS

Motor Age has received communications addressed to the Readers' Clearing House from the following named towns and nom de plumes:

Buffalo, N. Y.—F. L.
New Bremen, O.—Subscriber.
West Alexandria, O.—Reader.
Hicksville, O.—Reader.
Deer Creek, Ill.—Reader.
Appleton, Wis.—Reader.
————Reader.
Missouri Valley, Ia.—Subscriber.
Chicago—B. H. B., M. D.
Independence, Wis.— ————
Shelby, Neb.—Reader.
Talmage, Neb.—J. F. B.
Little Rock, Ark.—Reader.
Hutchinson, Kan.—W. L. J.
Adair, Ill.—F. P. M.
Freeport, Ill.—C. W.
Dayton, O.—Subscriber.
————Subscriber.
————Subscriber.
————Constant Reader.
Lake Arthur, La.—Subscriber.
St. Charles, Ark.—Subscriber.
Mt. Vernon, O.—Reader.
Brookings, S. D.—Tumtacks.
Columbia, Mo.—Subscriber.
Hugo, Okla.—J. H. M.
Tulsa, Okla.—Reader.
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Los Angeles, Cal.—Subscriber.
Two Rivers, Wis.—W. E. S.
Dexter, Ia.—G. W. M.
Crab Orchard, Neb.—Subscriber.

These communications will be held until the proper signatures have been received. All communications written over a nom de plume must bear the writer's signature, otherwise such communications will not be answered. These signatures are wanted as proof of the authenticity of the inquiries.—Editor Motor Age.

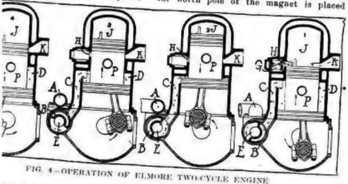


FIG. 4—OPERATION OF ELMORE TWO-CYCLE ENGINE

TERM CYCLE MISUSED

Edina, Mo.—Editor Motor Age—Please give me the meaning of the term cycle as applied to a two or four-cycle engine. Taking the word at its literal meaning, a gasoline engine would have but one cycle. Looking up the word in the dictionary, I found that the definition was given as a series of events or a revolution of events; therefore the explosion and the strokes that precede and follow it would be the cycle. Were the terms two and four-cycle merely applied to distinguish the difference between the two?

2—In what way does the carbureter on the Elmore two-cycle car distribute the gas to the cylinders. Is it through the crankcase, or have they a different arrangement?—Motorist.

1—The terms two-cycle and four-cycle are, strictly speaking, misapplications of the term cycle. A cycle is, as you say, a sequence or series of events. The cycle

of a gasoline motor are inspiration, compression, combustion and exhaustion, and hence no engine of any type can have more than one cycle.

The use of the term cycle is an erroneous but general contraction from the original term, stroke cycle, the word stroke being dropped for brevity. A two-stroke-cycle, meaning an arrangement of motor operation wherein the complete cycle of four functions, is accomplished in two strokes of the piston. A four-stroke-cycle is an arrangement which requires four piston strokes to accomplish one cycle of action.

2—The Elmore carbureter does no distributing. The gas is drawn from the carbureter by the suction of the air pump, which is the chamber at the lower end of the cylinder, in which the enlarged piston-end reciprocates. In their passage to fill the vacuum in the pump the gases are led through a rotary sleeve distributor, actuated at crankshaft speed by silent chains. This distributor is made in two parts, an outer and an inner, the intake of gases being through the outer part. On being compressed the gas is led through the inner portion of the distributor to the inlet of another cylinder. This arrangement does away with crankcase compression. Fig. 4 shows the operation.

CLOSE VALVES CARBONIZE

Ipava, Ill.—Editor Motor Age—I have a model 19 Haynes car equipped with a Splitdorf low-tension magneto. It is set so that the armature leaves the field ¼-inch with cylinder No. 1 on the upper dead center on full retard. Is this correct?

2—With this car after running 400 or 500 miles the valves carbonize so that they have to be taken out, cleaned and ground. Then the compression is good. I use medium oil, ordinary commercial gasoline in the model L Schebler carbureter. Would a different oil prevent the engine from fouling so badly?

3—Where is this engine manufactured? —Albert Shields.

1—Your magneto, if set as above, is right.

2—Your valves are set too close; lower the adjusting screw on the push-rods. There should be the thickness of an ordinary business card of play in your push-rod. The oil you mention is recommended by the manufacturer.

3—The Haynes company manufactures its own motors at its Kokomo factory.

SPRING CHANGES ON BRUSH

New Boston, Texas—Editor Motor Age—Please advise me as to whether elliptical springs could be substituted on a Brush car in place of the spiral springs. —Gordon McCullough.

Yes; but it is probable that if the change would make the riding enough easier to justify the additional cost, the maker would incorporate that style of spring in the design. The cooling system of the Brush is very satisfactory as it is.

What Kills the T

Tire Life Depends on Care—Large Tires More Than Small—Dealers Carelessness Responsible to New Tire—Non-Skids Last Longes

NEW YORK—Editor Motor Age—The manufacturers of pneumatic tires have exhausted nearly all of their resources in producing a good article that will stand up under hard service with a reasonable amount of success; but the owner still regards his tires as the chief source of weakness and trouble, and he blames the manufacturers for every puncture, blowout and general breakdown. The tire problem is today the most momentous one that engages the attention of car owners and makers, and judging from the number and kind of patents applied for it would seem that inventors were fully alive to their chance of making a fortune through a substitute device for the inflated rubber tires, or at least some improvement that will greatly lengthen their life-time of work.

Tire troubles are today considered to be due to the following causes, and their percentages will indicate what the owner can do toward lessening his expenses in keeping his car properly shod:

TUBE TROUBLE	Per cent
Normal wear	40.0
Pinched or nipped in mounting	15.5
Valve defects	12.5
Defective mounting	12.0
Sand and dirt in casing when mounting	8.0
Running on deflated tubes	6.8
Wrong cover holders	5.2
CASINGS TROUBLE	
Normal wear and tear	36.0
Perforation by nails, etc	25.5
Insufficient inflation	16.5
Cuts easily repaired	5.8
Outer damages, layers destroyed	5.6
Damaged by oil or fatty substances	3.8
Rusty and dented rims	3.8
Sudden braking	1.5
Shifting on rim	1.5

From a study of these percentages, which are the result of carefully collected data by authorities, one may get a fair idea of the chances an owner has of increasing the life of his tires. In the casings it will be noticed that outside of perforations and insufficient inflation the chances of a tire lasting a normal lifetime are good. In the matter of tubes, the life depends a good deal upon making perfect mountings and avoiding pinching or nipping and defective valves. With these causes removed or reduced to a minimum, the tire stands a fair chance of lasting until normally worn out.

Careful car owners are beginning to realize that the life of tires depends a good deal upon their use under proper conditions, and their responsibility in the matter must be shouldered properly before they can blame the manufacturers. The makers of tires are today conducting an educational campaign in the interests of both the users and producers.

Naturally there is a tendency on the part of users to choose small rather than large tires. The small ones cost less in the beginning, but if th one the cost in the end proportion of the tire t matter that can best be tire makers. Experiment made to ascertain the e for certain loads, and wh worked out mathematics results will be obtained i

An overloaded tire h There is no reasonable a puting this. A small t heavy car lasts from one the time a larger one wil proved in any number of poorly inflated tire like years of usefulness. It this practically means it ment to the junk heap.

There is no standard o how much air a tire need way is to pump it up round under the load. W a car may thus have a t air in it than when runni two people aboard the t fectly round and hard, b additional people are tal be too flat. A rule that served is to load the car number of passengers an tires until they stand per hard. They are then pro all emergencies.

Besides the car makers right sizes for the cars a must exercise judgment are the tire dealers who in the work. When the from the factory to the in perfect condition, but care in the dealer's ha teriorate greatly. It ma light, heat and oil in the carelessly kept in some where other articles fall per cent of new tires is of these ways. The user see to it that they get a their dealer, and not on held for a long time in t jected to deteriorating c times dealers realizing th gain prices on tires, wish their old stock which ha their hands.

No matter how good t rubber tire may be at th facture, it deteriorates w posure to light, heat an tube of rubber may be manufacture and its life of it. The desirable qua

Causes of Short Tire Service

Wear and Tear Only Contributory to Tire Destruction—Majority of Casings Are Discarded Before Worn Out—Owners Should Understand Manufacture

tube is elasticity. Without this it quickly breaks under the pressure of the air. Some inner tubes are of unusual thickness, but this does not always mean a stronger tire. The more inferior the material used in their manufacture, the thicker the walls of the tube must be to resist a given pressure.

The casing, on the other hand, which confines the inner tube within certain limits, is built up of different materials to make it answer the purposes of hard use. The casing has as its foundation a fabric composed of closely spun cotton, which is protected by the overstock of rubber. The material and its manufacture must determine to a large extent the value of the casing. Sea Island cotton makes the best foundation for the covering and Egyptian cotton comes next, but in some of the cheaper tires short staple cotton of an ordinary nature is used. Unless the cotton threads are long, tough and compactly woven, the strain on the casing will not be uniform and steady. The result is the casing splits at its weakest point and permits the inner tube to wear through at this point.

Usually three plies or layers of cotton fabric are used for the standard road tire. A specially prepared cement is forced through the meshes of the cotton fabric, and the layers vulcanized together by being passed between hot rollers. Finally the "overstock" of rubber is put on and the whole mass vulcanized in one roll. The overstock of rubber is intended to act as a cushion to protect the tire from severe blows. If this rubber is too hard it fails to act as a perfect cushion, and if too soft it will wear away quickly and expose the inner cotton fabric to road friction.

In the whole process of tire making, whether we consider the inner tube and casing separately or together, there are chances of defective workmanship creeping in. Some manufacturers claim that it is impossible to lay down inflexible rules whereby perfect tires can be turned out without a sign of defects. The best that can be done is to follow certain rules and then ultimately determine the results in each individual case by testing. Even then some defective tire will escape the vigilance of the experts and find its way on the market. But for the protection of the users the makers guarantee all their tires against defects of material and workmanship. Little more could be asked when we consider the delicacy of manufacture and the ease with which defects may creep in.

Understanding the intricate nature of the tire manufacture, the average car user is in a better position to conserve the lasting qualities of the article. The casing and tire are made to withstand a certain strain, and this strain should not be greatly exceeded by overloading. The rubber overstock of the casing is intended to protect the cotton fabric and to act as a cushion. Anything which cuts or unduly wears off this overstock must of necessity weaken the inner fabric. With the latter properly covered and protected, there is little danger of its breaking or tearing unless there is a defect in the material.

Oil, heat and sunlight injure the inner tube much quicker than they do the rubber of the casing. For this reason they should be amply protected. Sand, grit or foreign substances that work in through the casing scour and ruin the inflated inner tube. There is nothing which will cause a quicker deterioration. On hot days the use of a little non-friction powder inside of the casing will tend to reduce the heat that attacks the inner tube.

The general use of non-skidding tires today is for two purposes. Originally adopted simply to keep the tires from slipping or skidding, it has been found that the protuberances, whether of rubber, metal or other substances, protect the casings from wear and tend to prolong their life of usefulness. In some cases when the protuberances have all been worn off, the casing is practically as good as new, for it has not been worn down any by use. One practically has a new tire then equal to any plain tread shoe. While no guarantee is made by manufacturers as to the mileage before the protuberances of the non-skidding tires are worn off, it is generally estimated that they last for something like 1,500 miles.

The average cost of the non-skidding tires is from 18 to 20 per cent higher than the plain tread tires. Today about 40 per cent of the output of tires are of the anti-skid type. It is a question whether the owner of a car prefers to pay the extra cost for the non-skidding tires, and obtaining thereby the increased mileage from them, or to purchase the plain treads and depend upon the thicker overstock used on some of them.

The tire problem is thus one that is involved in many perplexing uncertainties both to the users and manufacturers. Many new devices are constantly being tried to give greater mileage to the tires. Some of these are abandoned within a short time and others are permanently adopted. Users differ in their opinion almost as much as the makers as to the relative value of the different varieties of tires. An unfortunate experience with one type will often prejudice a user forever against it, and another man with just the contrary experience will declare his faith in it. There can, of course, be no entire agreement on tires any more than there can be on cars. It is better that it should be so for the interests of the trade. Competition is thus stimulated, and the man with a new idea may place his article on the market and attract buyers. But whatever the value of the various types of tires, there is no question about the necessity of owners using cars, intelligence and knowledge in handling and buying the tires if they would get the best service.—A. S. Atkinson.

Some interesting figures have been given out by the Continental Tire Co. of Germany on tire wear and troubles. This concern has made many experiments on the subject of pneumatic tires, and the following tabulations summarize the defects in tubes and casings, which figures offer interesting comparisons with those of Mr. Atkinson:

DEFECTIVE COVERS

17.3%	by reason of running slow with too little air in the tire.
3.5%	because of rusty and battered felloes.
1.5%	by cutting of the cover strip through insufficient screwing up of the wing nut or screw, so that the cover can slip round the felloe.
1.8%	on account of too sudden braking, rubbing the tire through in some place.
0.2%	by contact with oil and other fatty substances, which, as is well known, will spoil rubber.
24.3%	

Of the other 75.7 per cent we have as follows:

29.4%	were punctured by nails, stones and pieces of iron.
4.3%	showed only slight injuries and cuts, which were readily mended.
4.0%	had severe injuries ruining the upper linen inlay.
38.0%	

The last 37.1 per cent of tires were simply worn out or rendered useless by normal causes.

The entire number thereof may be considered as having failed for the following reasons:

24.3%	by fault of the owner of the car.
38.6%	from abnormal causes.
37.1%	from normal wear and tear.
100%	

This shows about one-quarter of the entire number of failures of tire covers are due to the fault of the owner or his chauffeur.

In regard to the inner tube, the following has been shown to be the cause:

DEFECTIVE TUBES

13.0%	crushed in assembling.
7.2%	rubbed through by improper assembling, or by sand or small stones in the tire.
9.5%	by faults in assembling.
6.8%	from driving without sufficiently filling with air.
5.8%	by injury from rusty and deformed felloes.
4.0%	by injury from defective valves and improper handling of the valve.
56.3%	from fault of the owner or his employee.

The other 43.7 per cent defects were owing to normal and external conditions, such as: wear on casing from road friction, decay of fabric and rubber from age, and gradual weakening due to constant pressure.

The Mathematics of Motorin

METRIC TIRES AND EQUIVALENTS

Metric Sizes	Approximate Size in Inches
650x 65	26x2½
700x 65	28x2½
750x 65	30x2½
800x 65	32x2½
830x 65	33x2½
860x 65	34x2½
700x 85	28x3¼
750x 85	30x3¼
800x 85	32x3¼
860x 85	34x3¼
760x 90	30x3½
810x 90	32x3½
840x 90	32x3½
870x 90	34x3½
910x 90	36x3½
960x 90	38x3½
1010x 90	40x3½
815x105	32x4
875x105	34x4
915x105	36x4
820x120	32x4½—5
850x120	33x4½—5
880x120	34x4½—5
920x120	36x4½—5
1020x120	40x4½—5
1080x120	42x4½—5

FROM the number of inquiries received from motor car owners as to whether or not the particular tires on their cars are large enough and to what pressure they should be inflated, it seems that there is need for a method by which the motorist can find out for himself. All the tire makers supply tables showing what weights their tires are designed to carry and what pressure they should have, but with one or two notable exceptions they neglect to state how to find the axle or wheel load for any particular car.

It is necessary that the weight of the car be known to determine the proper size of tire for it, and the car maker's judgment in fitting a particular size of tire as regular equipment is not in every instance to be taken as final. Some of them are prone to undertire their cars from a false idea of economy. To obtain the exact weight of a car it is necessary to use a platform scale; that is, any scale that has a platform large enough to take the entire weight of the car. Know the weight of the car when it is loaded with all the passengers and accessories, water and gasoline tanks filled, luggage, etc., on board. In other words the car should be weighed when it is loaded with the maximum weight it is to carry. Proceed as follows:

1—Weigh the whole car.

2—Weigh the back of the car. To do this the middle of the step of the car should be over the edge of the platform scale.

3—Weigh the front of the car in the same way, the middle of the step being over the other end of the platform.

If this has been carefully done, the last two weights when added together should give within 20 pounds the total weight of the car found in the first position. Of course the wheel loads are one-half of the respective axle loads as found in this way.

In the tables herewith are shown the average tire sizes recommended by American tire makers as well as the inflation pressures. It is well to see that the tires are of the size specified and kept pumped up to the required pressure. In the matter of oversizes, all the tire makers agree that a larger tire, giving a larger air cushion, is better than a smaller tire with a smaller air cushion. They all recommend the oversize tire as a means to increase tire mileage.

The figures given by tire manufacturers as the most suitable for initial inflation generally take into account the increase in temperature and pressure created by prolonged running. It, however, is useful to know what this increase is. The figures shown in an accompanying table are given by a French authority and are averages computed on tires from 3 to 4½ inches diameter under usual touring car weight and speed conditions. For larger tires the increase is greater on account of the greater rigidity of the cover walls, resulting in greater internal strains in the fabric at the points of bending.

Another tabulation shows what may be termed the standard oversizes made by American tire manufacturers. Ex-

STANDARD OVER

Standard Tire Sizes	
28x3	takes.....
28x3	takes.....
30x3	takes.....
30x3	takes.....
32x3	takes.....
34x3	takes.....
36x3	takes.....
30x3½	takes.....
32x3½	takes.....
34x3½	takes.....
36x3½	takes.....
32x4	takes.....
34x4	..takes.....
36x4	takes.....
34x4½	takes.....
36x4½	takes.....
38x4½	takes.....
40x4½	takes.....
42x4½	takes.....
36x5	takes.....
36x5½	takes.....
38x5½	takes.....
40x5½	takes.....

cept for the first and t show an increase of only ness over the regular sto tires are 1 full inch wi tread and ½ inch wid rim than the regular s with them. The two si for tires of the Fisk t felloes.

TIRE AVERAGES GIVEN BY FRENCH AUTHORIT

Initial Pressure In Tire, Cold Lbs. per Sq. In.	Working Pressure In Tire, Warm Lbs. per Sq. In.	Increase from Lbs. p
71.116	88.183	
85.339	105.750	
99.562	123.546	
113.785	141.920	
128.008	158.588	
142.232	176.368	

AIR PRESSURES FOR PNEUMATIC TIRES

Diameter of Tire, Inches	Maximum Weight on Wheel, lbs.	Air Press per S
2½	225	
3	350	
3½	600	
4	750	
4½	1,000	
5	1,000	

PROPORTIONS BETWEEN AXLE LOADS AND TIRE

2 ½-inch tires, all diameters	225 pc
3. inch tires, all diameters	350
3 ½x28-inch tires	400
3 ½x30-inch tires	450
3 ½x32-inch tires	565
3 ½x34-inch tires	600
3 ½x36-inch tires	800
4 x30-inch tires	550
4 x32-inch tires	650
4 x34-inch tires	700
4 x36-inch tires	750
4 ½x32-inch tires	700
4 ½x34-inch tires	800
4 ½x36-inch tires	930

For weights in excess of 1,000 pounds per wheel, 5-inch tires and mended. Weights given apply to car without passengers

The Motor Car Repair Shop

FIG. 1—SHOWING HOW TO USE A JACK

ORDINARILY in jacking up a car the jacks are placed under the axles, but when the latter must be removed for some reason or other the jacks must be placed under the side frame members, which position is more precarious and less to be trusted. It is a good idea in such cases to make use of additional supports besides the jacks, as shown in Fig. 1. In this case the front axle of the car had to be taken off, and to make doubly sure of the frame's support after the wheels were relieved of the load, boxes or pieces of wood A were pressed into service.

First the jacks D, one at either side, were used to raise the frame slightly higher than the wooden supports A; then the latter were placed in position, as shown, and the jacks slowly let down until the car's weight rested on the wooden supports. The jacks could then be removed entirely. Such wooden or other supports are less liable to be tipped over than the jacks, which have much smaller bases. This is especially desirable in such a case as that shown here in Fig. 1, since in taking off the old member and replacing it with another much side jar is given the chassis, due to one cause or another. The supports with large bases give a much firmer support.

The illustration also brings out two useful and easily made accessories for the repair man. These are small stools, such as seen at B, which have many uses, one of which is brought out. The jack was too short to raise the frame to the desired height, hence the small bench or stool was pressed into service. Such wooden stools should be made of strong material, the one here shown having a height of 6 inches and a top measuring a foot square. It is made of 1½-inch material. Small horses C also have many uses in the garage and should not be overlooked. The most convenient size for the repairman is that which measures about 18 inches in height.

Repair Shop in Basement

Many a motor car dealer who establishes a sales agency gives up the quest for a place already built and decides that the only way to get the room he needs is to build a complete garage and sales room. This is most costly, and many dealers are resorting to the use of the basements under their sales rooms as garages and repair shops.

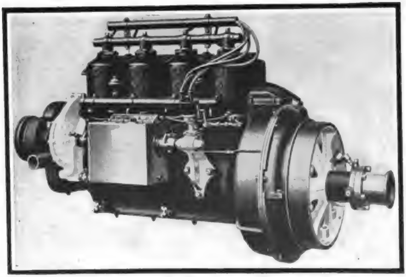
One city motor car selling company has remodeled the basement of its salesroom into a very good garage, where the maximum possible daylight is afforded. The basement has been continued out under the sidewalks on two sides—the salesroom is located on a corner—and sidewalk transoms send much of the daylight below. All delicate repair jobs are conducted as near as possible to these sidewalk lights, thus doing away with artificial illumination for the finer work and adjustments and increasing the workmen's efficiency. A view within this garage is shown in Fig. 2, which shows a car which has been run as near to the daylight as possible. Its hood is partly under the sidewalk windows, and sufficient light is afforded for carbureter adjusting, for magneto timing ,etc.

Under the sidewalk at the other side the workbenches are located, thus affording them the best possible light under the circumstances. Back in the shop, away from the sidewalk lights, jobs which can be readily carried on by the aid of portable electric lights is carried on. Such operations as that shown in Fig. 1 are conducted here. Should the repair man need more light than here afforded, he takes the piece on which he is working over to the workbenches under the sidewalk for more light.

FIG. 2—ILLUSTRATING A BASEMENT REPAIR SHOP

Rambler Line Reduced to One C

Cross-Country M
Offering fo
Considerat



RAMBLER UNIT GASOLINE AND ELECTRIC MOTOR WITH CLUTCH

RAMBLER cars for 1913 are marked by several departures from previous practice of the Thomas B. Jeffery Co. The most important of these departures is in the adoption of a single chassis model instead of the three different chassis employed heretofore. The larger motor of 5 by 5½ inches bore and stroke employed in 1912 with its two chassis of different wheelbase has been discontinued, leaving the Cross-Country model, which was the feature of this year's line, with its 4½ inch square motor. The Cross-Country model has been continued as the sole chassis model for 1913 with minor refinements throughout and some mechanical changes in the construction of motor and gearset.

The most radical change for the new season is in the adoption of a combination electric starting, lighting, and ignition system, which is an integral part of the motor construction; in fact, so much so is this the case that the maker prefers to call the engine a unit gasoline—electric motor. Inasmuch as the electrical system is a part of the chassis construction and design, and not the afterthought of additional equipment so often the case, it deserves special treatment.

The Electrical Changes

Starting, lighting, and ignition are all obtained from a single system, which is the design known as the U. S. L. type. The chief portion of the system is the motor generator. This system comprises: 1—a dynamo, which performs the functions of both motor and generator and replaces the flywheel of the gasoline engine; 2—a storage battery; 3
ated by a foot pedal an
which is located upon th
tom view of the chassis
elements as they are ins
The chief portion of th
course, the combinatio
tric motor and generato
one of the illustrations,
ing also has the funct
frame, the eight field
on cores which are bolte
Within this frame rota
of the dynamo, taking
usual flywheel and being
crankshaft of the engine
as the flywheel is attac
shaft also carries the
brushes of which are
just behind the armatur
place by bolts that pas
attachment of the rear
housing. The fact that
done away with permits
taken up in that of the
the different parts can
size without increasing
system unduly. Consequ
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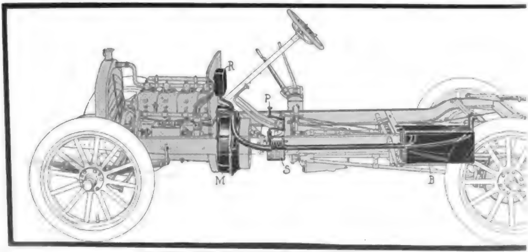


PHANTOM VIEW OF RAMBLER CHASSIS SHOWING ELECTRIC SYSTEM

Motor Big Feature of the New Model

Electric Starting, Lighting and Ignition Adopted for Next Year

PARTS OF RAMBLER MOTOR GENERATOR UNIT

of from 8 to 10 miles per hour. To start, a foot button is pressed, permitting current from the battery to run the motor generator as a motor at a voltage of 24 volts. The armature is rotated at 200 revolutions per minute and as the crankshaft of the gasoline engine is an integral part of the armature shaft, the engine is turning over at the same speed. Should the weather be cold and carburation pure, the heat created by the friction of the moving parts, it is said, will warm them sufficiently to give the initial explosions. When the engine is running on its own power, the electric motor automatically changes into an electric generator to charge the battery. Lights are supplied with current from the battery at pressure of 6 volts and ignition at 12 volts, the electric system displacing a magneto as a source of ignition current. The generator charges the battery at the rate of 30 amperes, while the current required for ignition and lighting, is together 9 amperes, while, it is stated, that the amount usually required for starting is replenished within 2 minutes after the motor has attained a speed of from 10 to 15 miles per hour. The controller is designed to automatically disconnect the storage battery and generator when the speed of the motor drops below that sufficient to charge, so that there is no opportunity for the battery to discharge through the motor except for starting purposes. The starting button operates an oil switch on the chassis frame side member and the storage battery is hung between two cross members of the frame below the tonneau.

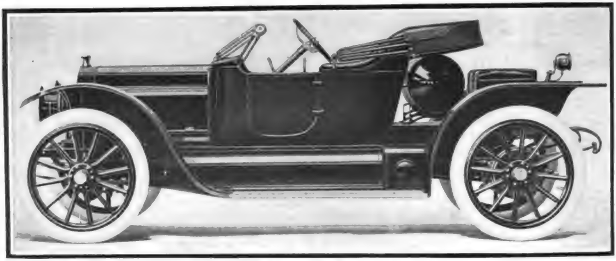
To take up the rest of the power plant, it may be said that the gasoline engine is four cylinders of the L-head type with valves on the right-hand side. The cylinders are cast separately and are 4½ inches bore and stroke through the motor and has three bearings; the use of the self starter has not necessitated the addition of another bearing between motor and flywheel.

Offset Crankshaft Continued

The offset crankshaft which has been a feature of Rambler construction for many years is continued, but the connecting rods have been lengthened slightly to give less wear between pistons and cylinders. Both intake and exhaust valves have been increased to 2¼ inches in diameter and are interchangeable. The only other alteration in the motor is in the use of a Detroit mechanical oiler of 2 gallons capacity, located on the motor base at the left of the cylinder. The oiler is a seven-feed type with four oil tubes leading to the cylinders and the remaining three to the crankshaft bearings. A splash is contained within the crankcase. The motor suspension is continued as a three-point support, a tubular cross piece, 2 inches in diameter, forming the front supporting members. The entire motor is mounted at a slight rearward slope.

Another change is in the use of a Stromberg carbureter with a hot-air jacket from the exhaust manifold on the footboard. Immediately in front of the steering post is a push button by which the air intake may be closed to give a richer mixture on starting. The new type of radiator which

CROSS-COUNTRY RAMBLER IN ITS 1913 DRESS



CROSS-COUNTRY RAMBLER ROADSTER FOR 1913

appeared for the first time in the 1912 cars is continued in the 1913 Cross-Country. A belt-driven fan immediately behind the radiator is driven from the shaft which drives the pump and assists the latter in maintaining the cylinder cooling. Ignition wiring has been changed from position at the right side of the cylinder to a point immediately above the water manifold, where it is incased in a waterproof tube, as is shown in one of the motor illustrations.

Cone Clutch for 1913

Immediately behind the motor-generator-flywheel, and partially within its housing, is the clutch. The latter embodies a decided alteration from previous Rambler design in that for next year it is of the cone type instead of the internal expanding type which has been heretofore one of the features of this product. The new clutch is shown in one of the illustrations and is a direct-acting cone in which gradual engagement is obtained by springs under the leather facing.

Located amidships of the chassis frame is the three-speed selective gearset, which also embodies a slight change in design for 1913. The arrangement of the gears and control connections have been altered slightly, in order to decrease the movement of the hand required in changing speeds; heretofore, it has necessitated a movement of the top of the gearset lever of nearly 1 foot, whereas, in the new arrangement the total movement is but 6 inches. There has been no change in the propeller shaft or rear axle, the latter being rigidly connected to the gearset by means of a torsion tube surrounding the propeller shaft. On each side of the propeller shaft tube are the torsion rods which, as for the past year, are in V form, the spreading arms attaching to vertical arms on the rear axle housing. The rear axle is of the floating type with roller bearings, drive axle shafts and gears forged integral and the wheels secured to the square taper axle end. The front axle is a drop forged I-beam with an adjustable taper roller bearing.

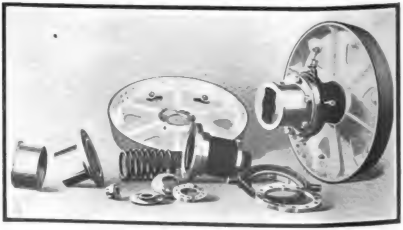
The brakes are internal expanding and external contracting on the rear wheel drums, which are 14 inches in diameter and 2½ inches in width. There has been a slight alteration in the brake connections which makes for simplicity in the new models. The countershafts for the two brakes which formerly were separated, are now combined in one; one being located within the other, the outer one being in the form of a tube.

The frame construction is the same as that of the present model, a tapering straight-line channel to just forward of the rear axle where there is a kick-up to clear the latter. Wide gusset plates are provided at the corners to prevent distortion. Springs are continued as semi-elliptic in front and three-quarter elliptic in the rear. The wheelbase is continued at 120 inches and the tires on all but one of the models—the Gotham—are 36 by 4 inches in size; with the latter body the tires are 37 by 4½ inches in size.

Another one of the recent improvements which has been continued in the new model is in the adjustable steering pillar. The steering column is hinged to the frame and the column rises through a slot in the floor. A metal plate through which this column passes covers this slot. The under side of the slot is serrated and these serrations mesh with others on the floor boards. Clamping bolts hold the plate in any desired position and by loosening the bolts the plate may be moved forward or aft, giving the steering column any tilt desired by the driver of the car.

Five Body Models

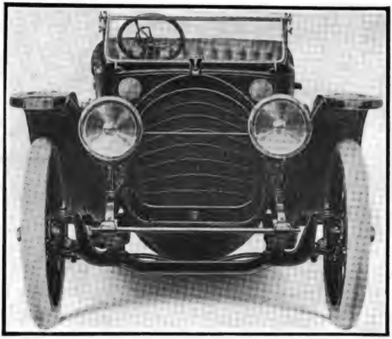
Five different bodies are fitted to the Cross-Country chassis. These include a four-passenger touring, a five-passenger touring, a two-passenger roadster, a Sedan body with inside drive and seating four passengers and a Gotham or limousine body with inside drive, seating seven. The bodies are trimmed in nickel with body fenders and fillers of black enamel. The upholstering has been increased from 8 to 10 inches depth and a bumper has



RAMBLER CLUTCH PARTS AND ASSEMBLY

been fitted on the forward ends of the front springs. The electric lighting equipment includes 9¼ inch headlamps with port dashlamps flush with the dash line. The rear lamp is mounted on the fender and has a twist switch so that it will comply with local city ordinances.

Aside from standard equipment, the features of the Cross-Country roadster, in the matter of accessories, are that of the trunk with two suit cases; the two closed bodies are trimmed in gray bedford cord with electric pillar lights between driver's seat and rear compartment in the case of the Gotham body and electric dome light in case of the Sedan.



FRONT VIEW OF CROSS-COUNTRY RAMBLER SHOWING LAMP EQUIPMENT

The Motorists' Bookman

Analytical Advertising

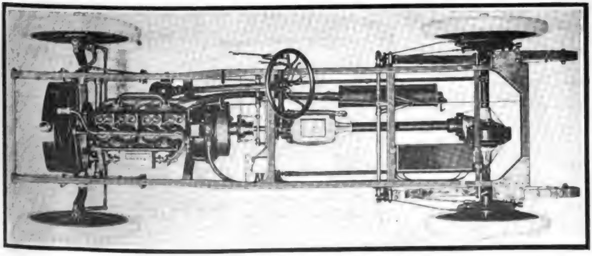
WILLIAM A. Schryer has prepared a work on "Analytical Advertising" which is the result of extended experience in practical work in this line. The subject is entered into in a very thorough manner. The principal of analysis as applied to advertising is very well expressed in Mr. Schryer's words:

"The concern of every intelligent advertiser should be to discover principles, that he may work in accord with them to his greatest profit. This premise assumes that advertising, in conection with any business, is for the sole purpose of selling at the greatest profit."

The matter is so composed as to bring out the inter-dependence of even the smallest details of advertising copy. The psychology of salesmanship through written copy is well covered, with its bearing on efficient publicity. The value of definite records is strongly emphasized, many interesting examples of experience being cited to bring out the principles requisite to good results. A successful plan of motor car advertising is described, which is well worth the earnest study of every motor car advertiser. The book is attractively bound in cloth, contains 288 pages well illustrated with diagrams, facsimiles, etc. The Business Service Corporation of Detroit, Mich., is the publisher.

Elements of Statistical Method

For use as a text for students of statistics, and for statisticians generally, "Elements of Statistical Method" by Wilford I. King, M. A,, instructor in statistics in the University of Wisconsin, is published by the Macmillan Co., of New York. The author has avoided complicated mathematics in the belief that statisticians as a rule are not expert mathematicians. Such a work is unique in its scope in this country, and should prove valuable to any who have statistical work to do. The volume treats comprehensively of the origin and use of statistics and their definition and limitations. The reader is next given an exhaustive treatise on methods of compilation, analysis, and the mathematics of statistical research. The work concludes with an interesting study of the comparison, correlation, and ratio of variation of statistics. A useful appendix supplements the work, containing tables of logarithms and squares. The book sells for $1.50 net.



VIEW OF THE RAMBLER CROSS COUNTRY CHASSIS FOR 1913

Halladay in the Six-Cylinder

One of the Ne Marked by T of Constr

HALLADAY 32 TOURING CAR AS IT APPEARS FOR 1913

ANOTHER maker has joined the six-cylinder ranks. This time it is the Halladay that comes out with the increased number of cylinders in one of its models for 1913. With the one exception of the change from four to six cylinders in the model 50, there is practically no mechanical difference from the three chassis of the present season. Model 50 will have six cylinders of 4⅛-inch bore and 5¼-inch stroke instead of the four cylinders of 4¾ by 5-inch bore and stroke employed this year. The other two models are the 32, which is mechanically the same as this year's model 30, and the model 40, continued with minor refinements from this season.

The model 50 has the six-cylinder Rutenber motor, the latest product of the Western Motor Co. The cylinders are cast separately, of the L-head type with the valves inclosed in an easily removable cover plate. Both the camshaft and the crankshaft are in the same horizontal plane and can be removed or adjusted from below after the lower half of the crankcase has been taken down. Both inlet and exhaust valve have a lift of 2 inches. The valve pushrods are lifted by a lever and roller combination, comprising a rocker arm pivoted at one end on a lug dropped from the motor base, the upper portion of the other end bearing on the bottom of the pushrod. At the middle of the rocker arm is a roller of comparatively large diameter which bears upon the valve cam on the camshaft, thus the lift of the valve is almost double that of the cam and the roller prevents excessive wear of the cam.

Valve Operation

These roller and lever combinations are mounted in pairs and are readily removable as units. Fans are provided with a spring support for maintaining proper tension on the valve. The water manifold has brazed joints. The magneto is driven from a shaft that drives and pierces the water pump so that intermittent strains on the magneto shaft are not transmitted to the gear but are cushioned by the water in circulation.

The waterjackets and valve chambers are cast integrally and the pistons are cast of the same materials as the cylinders. Piston rings have square lap joints and are four to a piston, three above the pin and one opposite the pin, so as to prevent it from working out and scoring the cylinder. Piston pins are made from steel tubing which is hardened and ground; and the piston pin bushings are made from phosphor bronze pressed into the pistons and reamed.

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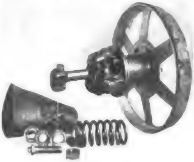
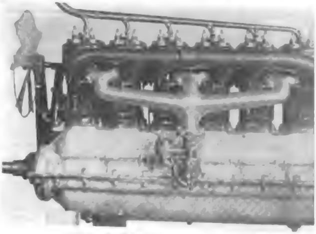


HALLADAY CONE CLUTCH



INTAKE SIDE OF HALLADAY 1913 SIX-CYLINDER MO

Few Changes Made in Models for 1913

Minor Refinements Mark Product for Next Year of the Streator Company

are all chrome vanadium steel. The universal between clutch and gearset is liberal in proportion with hardened and ground surface. It is entirely inclosed so that it may be packed in grease.

The gearset has four forward speeds with direct drive on third. The total gear reduction on the fourth is 2¾ to 1 and on the third or direct drive is 3½ to 1. The drive to the rear axle is through a torque tube integral with the axle and the car is driven through a pair of radius rods, a spring seat on the axle being free to swivel. The frame is a double drop with a 5-inch pickup in the rear. The rear axle has a pressed steel housing so that by removing several cap screws, the entire mechanism can be withdrawn as a unit. Three-quarter elliptic springs are employed in the rear.

Rear Axle Construction

The rear axle is of a very rigid pressed steel cone construction and is of the floating type. It is equipped with annular ball bearings throughout with internal service and emergency brakes. All brake connections and brake eveners are made of drop forgings. The front axle is a heavy one-piece drop forging with a steering cross rod carried to the rear. This model is made in two wheelbases, 134 inches on a seven-passenger body and 128 on the four-passenger. Tires are 36 by 4½ inches.

Model 40 of the Halladay line begins its third season without constructive change but with several refinements in details of body and equipment for 1913. In it is used the same size of motor as in the 50 except that there are four cylinders instead of six. Aside from dimensions of the parts, the construction is almost the same as that of the six-cylinder car. The wheelbase is 118½ inches and the tires are 36 by 4 inches.

Model 32 is almost the same as this year's model 30. Either a Rutenber or Continental motor is supplied. The motor is of the long-stroke type with a bore of 3¾ inches and a stroke of 5¼ inches. The details of construction of the Rutenber motor of this size are the same as those of the larger model already described, while the construction of the Continental motor is similar in many respects. Except for dual instead of double ignition, the general design of the car is the same as that of the larger model.

There is one point about the construction of the 32 motor that is worth emphasizing and that is the size of the camshaft bearings. These are so large that the entire camshaft, cams and all, can be withdrawn through the bearing without removing the latter. The cylinders are offset ½ inch from the crankshaft to give maximum torque with minimum friction. The Briggs dual magneto is used. The wheelbase is 112 inches and tires are 34 by 3½ inches front and rear.

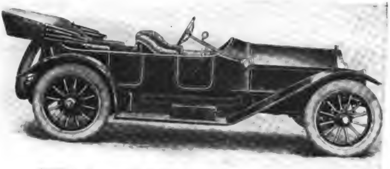
Halladay Body Types

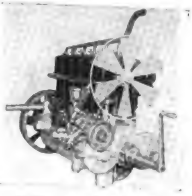
The types of bodies are supplied on the model 32, a five-passenger touring and two-passenger roadster with trunk and gasoline tank on the rear deck. A neat arrangement is used for carrying a spare demountable rim and tire at the rear of the car. Three rigidly-supported brackets from the body and frame grip the rim so that no straps are necessary, and the rim and tire are held rigid with no chance for the tire to chafe, as there is nothing with which it can come in contact except the rim on which it is inflated. The cars are all equipped with a provision for adjusting the carbureter from the seat and with ventilators in the dash.

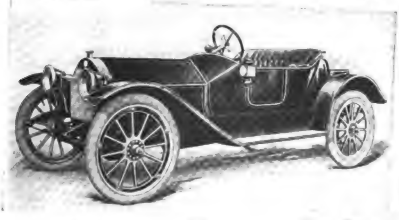
Three bodies are fitted to the Halladay 40, a five-passenger touring, a four-passenger toy tonneau and two-passenger roadster. The car also is electric lighted throughout, the current being supplied by silent chain-driven generator when the car is in motion, and by storage battery when the car is standing still.

The two bodies fitted on the model 50 include a seven-passenger touring car and four-passenger toy tonneau; the equipment is the same as that on the 40.

The body lines and details have undergone minor refinements with a view too improving their appearance and comfort.


HALLADAY 6-50 TOY TONNEAU MODEL AS DESIGNED FOR 1913


FRONT OF HALLADAY MOTOR


HALLADAY 40 ROADSTER OFFERED FOR 1913 CONSIDERATION

Hudson Company Also Offering a Six

HUDSON 54 SIX-CYLINDER MOTOR

THE number of six-cylinder motor car manufacturers have been augmented by the Hudson Motor Car Co., which has just announced a model of this type. The new six is to be known as model 54, the figure representing the developed horsepower of the engine on block tests. The wheelbase of this new model 54 is 127 inches, which is 9 inches greater than that of the recently-announced model 37, the company's four-cylinder offering for 1913.

Mechanically, the newest addition to the line is an exact counterpart of the four, except that its proportions are larger to be consistent with the greater weight and size. In fact, it is nothing more nor less than a bigger edition of the four-cylinder machine. The motor is made for the Hudson company by the Continental concern according to the former's own design, and is not a stock product of the latter; the frame construction and its method of bracing is the same for both cars; the gasoline tank is placed in the rear under the frame, necessitating the use of a small air pressure to force the fuel to the carbureter, a feature which is found this year for the first time in the Hudson design; the Delco combination ignition, lighting and starting system, also new to Hudson cars, appears on the six; the rear axle is of the same type as used on the four; the method of bolting the gearbox to the rear of the motor, making a unit power plant construction, is identical on both models.

Hudson Six Motor

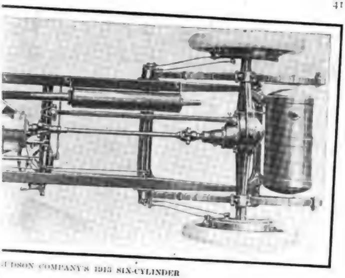
The 54 motor has a cylinder diameter of 4⅛ and a stroke of 5¼ inches, giving it a stroke-bore ratio of 1.27. This accounts for the fact that, while the S. A. E. formula gives the motor a rating of only 40.8 horsepower, the actual horsepower developed on the block when running at 1,500 revolutions per minute is 54, according to the Hudson engineers. The motor being an L-head type, the valves are all on one side, the left. The cylinders are cast in blocks of three, which fact has been taken advantage of to lessen as far as possible the number of manifold connections with the cylinders, the distribution to the ports from the central openings into the manifolds being taken care of within the castings themselves. There are two intake manifold connections, one for each block. The water outlets present a peculiar form, in that they are large and extend over the entire top of each block, the two connections being joined together by rubber tubing. There also is one connection with the water outlet manifold for each block of three. However, this does not apply to the exhaust manifold, which connects individually with each cylinder. These connections are uniform up to the rear two, these being of peculiar design due to the downward slope of the manifold at this point, so that it will pass under the floor of the car and clear the floor boards.

The motor supports are cast integrally with the upper half of the crankcase. There are four of them, one on either side in front, and one also at either side opposite the flywheel and just to the front of the point where the gearbox members bolt to the motor. The valves are all inclosed, each block of three cylinders being fitted with a cover plate. This feature tends to increase the motor silence and to protect the valve stems, tappets and springs against foreign matter. The valves are interchangeable and have nickel-steel heads. The diameter is 2 inches, and the clear opening 1¾ inch, as on the four-cylinder engine. The valve stems are long, and are fitted with conically-wound springs, which have their smaller diameters at their lower ends. The tappets are of mushroom type and bear on the cams at all times.

Pistons Are Extra Long

Pistons are of gray iron and extra long, this latter feature being incorporated to aid in distributing the side thrust to as much of the cylinder wall as possible and thus to reduce the wear on both cylinder wall and piston. The wrist pins are pressed into the piston bosses very tightly, and are prevented from working loose by means of nickel-steel studs, locked by cotters. The bearings within the upper ends of the connecting rods are also pressed into place. They are of hard phosphor bronze and have a diameter of 1 1-16 inch and length of 1⅞ inch. A large hole is drilled through the top of each rod's upper end so that the lubricant splashed up may enter the bearing and effectively lubricate it. Like the four, the six-cylinder motor has a three-bearing crankshaft, the bearing sizes being 2 inches in diameter by 2 9-16 inches in length for the front, 2 by 3 inches for the center and 2¼ by 2 13/16.

HUDSON TORPEDO 54 SIX-CYLINDER MOTOR



UDSON COMPANY'S 1913 SIX-CYLINDER

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he shaft to slide back and forth, due to differences of the relative position of the rear axle, on account of unevenness of road surface. The sliding square has a width of 1⅝ inch and measures 5½ inches in length, making it amply strong. From a cross brace of the frame a tapering torque rod passes parallel to the drive shaft back to the rear axle. The front end of this arm, which is the smallest, is fixed in a buffer which has a double spring construction.

Pressed-Steel Type Rear Axle

The rear axle is of pressed-steel type and floating, all the car weight being carried on the tubing and none on the axle shafts. The driving gears and differential are mounted as one unit and can be removed without dismantling the entire axle. Pinion and differential gears are mounted on large roller and thrust gearings, the whole running continuously in an oil bath. The driving shafts connect with flanges which bolt to the rear wheels for transmitting the power to the latter.

Brakes are of the conventional internal emergency and external service types. The drums are 16 inches in diameter by 2 inches in width. Twelve bolts fasten each drum to the spokes. The drums are of one-piece pressed-steel construction. Wheels themselves are of artillery type, having ten and twelve spokes, front and rear, respectively, all of which spokes have a diameter of 1¾ inches.

Like the dashes fitted to the 37, those of the 54 are leather-covered, and the various instruments are arranged with the idea of making those which are most important most easily reached. The dash equipment consists of switches, operating lights, self-starter and ignition circuits, magnetic gasoline gauge, gasoline pressure gauge, speedometer, oil-flow gauge and horn bulb. There also is a small dash light which is in circuit with the tail lamp. Should the latter go out for any reason, the fact will be indicated by the dash light being dark also.

The Realm of the

ing the Truth About Motor Trucks

I know that motor trucks will money?

find out if I can use motored or delivery work in my busi-

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questions which are in the any business men just at this o many others and some maybe titors are taking up the motor elivery and distribution work. y know? Where can they get tion?

truck salesman—now, it is to the past—has abused the con- h prospective customers have s word in many cases, and in estimates has manipulated fig- advantage of the trucks.

vertising

since the writer sought operat- in regard to motor trucks in ice in one of our large cities, omised a complete account of ned with one local firm. Much de over the great showing of figures at last presented under , "Actual Cost of Operating Truck," and ending with the eferring to "the above figures, the actual cost of operating ——— cars. These figures rything but the insurance":

ebruary	March	April	May
$21.30	$23.79	$24.16	$20.00
2.36	3.32	2.80	3.32
2.60	3.00	2.60	7.35
42.50	42.50	42.50	42.50
$68.75	$72.61	$72.06	$72.97

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50 item is a maintenance guar- uding garaging, washing, re- of parts and use of extra truck aine is laid up, on a 5-year

se figures are all well and good they go, but to say that they but insurance is misleading. ould be included the following, insurance only has been men- he agent:

	Per year	Per month
$2,500 at 6 per annum..........	$150.00	$12.50
at 20 per cent n...............	500.00	41.67
tax..............	12.00	1.00
....	200.00	16.67
....	$862.00	$71.84

Salesmen Should Be Able to Fully Advise Prospective Buyers

Adding this amount of fixed charges to the above monthly amounts, the monthly cost is seen to be in fact about two times what the agent quoted as being the "actual cost of operating except insurance." Instead of $72.06 as the cost for April, the cost is more nearly $143.90 for 4,731 miles, thus bringing the actual expense of the truck to $5.53 per day, not counting the driver, which adds $2.50 to this table of expenses.

Cost of Operating

Driver and all included, it costs the firm operating this truck $8.03 for the day's work—26 days per month—yet at this the machine is making a fine showing and needs no excuses from the salesman for boosting of figures. A daily average of 45½ miles is shown for the machine, which at this works out to a cost of 18 cents per mile. This is better than any horse outfit can accomplish, for at a cost of $6 per day, contract rate for teams which have a maximum daily mileage of 15, the cost per mile for a smaller load than the motor truck can carry is 40 cents. The truck, therefore, even under present conditions, shows a saving of 22 cents per mile over horse installations for a distance of 45½ miles, or $10.01 per day, this with a load probably 20 per cent greater than the horses would draw.

It would seem that the salesman in this case had not grasped the significance of the figures he had in hand rather than attempting to mislead in his report, and it is surprising how few of the salesmen who are attempting to handle motor trucks know the basic principles of truck operation or of cost figuring.

The first type of salesman to approach the prospective buyer is the touring-car type of agent, who has all the data concerning his machine at his tongue's end. He can tell you the advantages and disadvantages of worm gear or side-chain drive with all the volubility of a book agent; he can quote all authorities on every point of motor design which proves his machine the best. He does not know, perhaps, the body size of the machine, but he can tell you what load it will carry and all about how much overload it will carry and "not hurt it at all." Ask him about service and he is dumb. As to business methods and delivery systems he

VICTOR SHOWS HILL-CLIMBING ABILITY FOR FIRE CHIEFS

Commer

[illegible] nothing. Talk of loading and un[illegible] systems and he is entirely at sea. This man can only sell trucks to corner [illegible]. When they have bought, too, the [illegible] takes other territory and leaves the buyer to sink or swim by himself.

Second comes the man with a mass of figures of truck operation in other fields such as I have just been given, presenting a long list of what his make of machine is doing here and there. If the buyer be new at the game, he may fall for the talk. Many do and for some classes of service where trucks are being put in it is efficient.

"We are doing so and so with what's [illegible]," says the salesman. "Now, you [illegible] one of our machines and do the same." And the buyer thinks, as the salesman has said, that all he has to do is to buy a truck and put it to work.

Not True Salesmanship

This type of salesmanship does not get orders from big jobs. His figures may be correct, though they are not always, but the fault in the system is that when the man has sold the truck the buyer is no further along toward the successful use of a motor truck than is a man learning to swim toward actual swimming who has just bought a bathing suit. It is not the [illegible] that counts, or the bathing suit—which is a mere adjunct to the real business [illegible]. If the buyer fails to make the machine pay he blames the motor truck, but if a bather can't learn to swim he rarely blames his bathing suit.

The mass-of-figures type of salesman will [illegible] land an order with the up-to-date man who knows his business.

Finally appears a more businesslike type of man, who looks in the first place as though he had a degree of brains to apply to the question in hand. This man hardly mentions motor trucks, but starts off a [illegible] of questions which show at the start that he has had some knowledge of up-to-date method of handling goods. He knows [illegible] and proper systematizing. [illegible] questions something like [illegible]:

How many horse vehicles have you and what [illegible] and type?
What are your average loads?
What is the average length of a delivery [illegible]?
What kind of loads do you have, package or [illegible]?
What kinds of roads do you operate over?
[illegible] necessity for extra heavy loads at [illegible]?
[illegible] object in your delivery work?
What is the average two-horse load in your [illegible]?
[illegible] thinking of motor trucks to increase [illegible] or to save money over horse equip[illegible]?
How many stops do your wagons make per [illegible]?
[illegible]
[illegible]
What is the nature of the stores [illegible]. Are

ommercial Car

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r routing maps.

nature of the stops made? Are they long? Are they house to house or apartment? Are they to stores or factories?

Are conditions such that you can change the system to facilitate loading?

Can you hasten the unloading over the present time?

What is the labor situation in this territory? Are drivers hard to get?

Is knowledge of delivery system now used important in drivers?

Are your present drivers intelligent enough to operate motor trucks?

Will the driver need a helper in unloading or in sorting packages?

These and a mass of other questions which strike deeper and more intimately into the business of the prospect as they proceed are asked by the new man, and the business man answers them because he feels that at last someone is on the job who is competent to handle his proposition.

Following the questions, the salesman goes out to verify the figures given him by the manager or prospect. First he checks up the horse equipment, and figures costs anew, generally finding that this system is costing far more per delivery than the business man has figured. In few cases does he find correct and complete cost figures on horse equipment.

Then follow trips with the wagons, checking up routes, sounding the ideas of drivers and other employes, poring over city maps and planning route changes to fit new conditions if motor trucks are put in.

''It would be foolish,'' says the salesman, ''to throw away the horse equipment at this time and put in trucks entirely. Let's see where a truck will fit in best as a start, and with that beginning and the lessons learned there let the proposition grow, adding to the truck fleet as the indications of business and the loss of horses demand.''

Beginning to Talk Car

And so, after weeks of figuring, planning and study, all of which is greatly facilitated by the knowledge of the salesman obtained in similar work elsewhere, a plan is arrived at. Then and then only does the salesman begin to talk his car.

''Hauls here are short and in a congested district, so for that service my 1-ton electrics are just what you want,'' he is told; or, if he be a gasoline car salesman, after explaining about the electrics, he turns to another part of the system and says: ''On this long haul of bulk loads you will need a 5-ton gasoline car.'' With this beginning he starts in where the other salesman began his argument, explaining what his particular make of truck has done in other places under almost similar conditions and perhaps obtaining letters from the users in corroboration of his statements. After this comes the detailed and mechanical description of

FORWARDING BUSINESS REVOLUTION

TO buy a touring car is to boost good roads. The motor pleasure car has revolutionized the nation's idea of what a good highway is, and lifted road transportation to new possibilities.

To buy a motor truck is to promote a business revolution.

The motor delivery vehicle will revolutionize the business man's idea of what efficient service and traffic can be, and give to the local distribution of freight and commodities a higher standing than it has heretofore possessed.

As every touring car sold in the past has been but another unit of a vast influence toward bettered road conditions and efficiency in inter-city touring, so every motor truck being sold is but an added influence toward the betterment of conditions in delivery and hauling work at present far from ideal.

Delivery work has too long been considered an adjunct to business, a mere side line, and yet with methods of today service is on par with cost if not in advance of it as a business-getter. A great part of business service depends on the delivery system. It is time to take this part of the commercial system seriously, to work it out systematically and to eliminate all waste from its operation. The cost of distribution of products in our larger cities is a considerable item and yet old-fashioned, slip-shod methods entailing long waits and many idle hours a day are still in vogue.

The greatest bugbear of the horse system is idle time made necessary by the rest periods demanded by the horse. This idleness of equipment induces idleness of the driver and so on to influence the whole system of goods handling; keeping down the mental standard of the men employed through lack of incentive to better efforts and hindering materially.

The motor truck stimulates the men handling it to a maximum effort. If they are not mentally advanced enough to appreciate and take advantage of the new condition they are eliminated and brighter men put in their places. Wages are increased to those who make good according to their increased earning capacity. The motor truck demands quick, effective and thoughtful effort to make it pay its best. This demand by the vehicle must be met by the men. Those satisfied with loose methods in delivery at present will in the future call for efficient system and the whole world of delivery work in all our cities will at once step up to a higher plane in business life, and receive the attention it has long deserved.

To buy a motor truck is to forward a business revolution.

SAMPSON TRUCK WHICH DISPLACES SIXTEEN MULES

the truck, if wanted. The first man on the job selling trucks began his talk with this part.

In this case the truck firm, through the sales agent, has done the buyer—for he has bought a truck by now—a real service. It has shown him how to use his machine to make it pay, before selling it, and as a result, after it is in service and making good, the truck gets the credit, the firm gets reorders, and the agent—who spent so much time on the job that he probably lost money on the first sale—reaps a golden harvest from the unsolicited reorders later on. He has built on a solid foundation.

Firms furnishing this kind of salesmanship are working along the right lines.

The day of the transportation engineer is at hand, of the man with brains and the willingness to use them in working out real problems—not wasting his breath on promises, but marshaling facts for the prospect to base a sound judgment upon—and the man who is thinking of equipping with motor trucks for delivery work would do well to look him up.

Motor truck installation is no longer guesswork.

NEW KIND OF WATER WAGON

American municipalities have been comparatively slow in taking up motor truck apparatus in their street and sanitary engineering departments, primarily because the motor manufacturers have not in very recent years devoted attention to the development of body designs suitable for municipal service. In Europe the motor-driven road sprinkler, road-oiling machine and motor garbage wagons have been in service for several years and European municipalities have developed the use of motor truck apparatus to a high degree of efficiency. For instance, in Rouen, France, all street cleaning apparatus is of motor-driven type and economies as great as 150 per cent over former horse equipment are reported. In New York city, Commissioner Edwards is now experimenting with motor garbage carts and reports that the cost by former equipment was as much as 80 per cent per ton of garbage removed, whereas the motor trucks have shown cost of but 23 per cent per ton.

The International Motor Co. has begun the developments of municipal apparatus and recently sold to the city of St. Louis a motor street sprinkler of unique design, built on a 6½-ton standard Saurer chassis. The water tank has a capacity of 1400 gallons, or 231 cubic inches. It is double riveted longitudinal and transverse seams. The water tank is fitted with three baffle plates and four bilge angles so placed as to prevent any circular motion of water. The pump equipment consists of a Gould fire pump with a capacity of 400 gallons per minute against a pressure of 30 pounds of the pump circuit, and 10 to 12 pounds at the nozzle. The pump is geared at 400 revolutions per minute at a truck speed of 6 miles per hour which gives a water distribution of 1 gallon per 45 square feet.

Control of the sprinkler is effected by two levers, the first one throwing in and out of gear a jaw clutch operating the pump from a driving sprocket secured to a differential housing. Lever No. 2 operates on an inter-locking quadrant independently and together, the gate valves governing the two nozzles. The nozzles are easily adjusted to the full limit of useful nozzle pressure, in addition to an adjustment by a single ring nut which permits the throw of the water from the nozzles to be regulated for varying widths of streets. When the two gate valves leading to the nozzles are closed, pressure is obtained by an adjustable by-pass valve on a closed pump circuit. This pressure can be varied from 0 to 50 pounds pressure per square inch. The tank is equipped with a 10-foot hose, fitted with a standard hydrant connection at its end. This hose is connected to an automatic spring pressure check valve which permits the filling of the tank, and when full, automatically closes, thus necessitating no further attention from the operator other than that of disconnecting the hose from the hydrant. A ball float is fitted to the top of the tank, in addition to a small manhole, which permits the operator to judge the height of water in tank.

OILING MARYLAND ROADS

Roads in the various sections of Maryland are being kept in up-to-date condition by oil applications, which are distributed from a tank on a motor truck chassis. The combination is operated by the Standard Oil Co., and is the property of that company. The company also has several of these tanks operated on motor trucks in service in other sections of the country. The chassis of the truck was built by the Metzger Motor Car Co., while the tank, pipe work and sprinklers were arranged and put together by the Standard Oil Co. at its plant at Bayonne, N. J. The entire combination, excluding the chassis, was invented by George M. Saybolt, after whom it is named, and who is an employe of the Standard Oil Co. The machine is driven by a Hewitt 30-horsepower engine.

A three-cylinder Gould pump is used to force the oil through sprays in the rear of the tank at the bottom and injects the oil

NEW INTERNATIONAL MOTOR CO. SPRINKLING CART

into the surface of the road at an average of 100 pounds to the square yard. These sprays or spigots are arranged so that they can turn down toward the road and throw out as much or as little oil as is desired. The sprays can throw out a quantity of oil ranging from 1-6 to 1-3 gallon to the square yard, according to the amount needed on different sections of the road being treated. These oil applications keep the road dustless and at the same time cause the thoroughfares to retain their smooth covering.

The vehicle used for this road oil treatment makes a speed varying from 2 to 12 miles an hour. The speed used depends upon the oil coating necessary at the different sections of the roads. As a general average, 7 miles of road of a width of 12 feet is given the treatment during a day. In addition to distributing the oil mechanically from the tank, the pump also pumps oil into the tank by means of a hose attached to the tank cars.

FEDERAL MOTOR TRUCK CO.'S FIRE APPARATUS WAGON

HOUSE-MOVING BY TRUCK

Every day sees new uses for the motor truck. The latest is house moving as practiced by the Krueger House Moving Co. of Chicago. This firm in a very enterprising manner uses a 6-ton Mogul truck to haul houses, first mounting the house on three heavy four-wheel trucks. When all is set, the Mogul is loaded to give it plenty of traction and hitched to the job. With this arrangement there is no difficulty in hauling the houses over hard roads, as Chicago is almost entirely level. Much better speed is obtained in this way than is possible with horse and windlass systems.

USES TRUCK FOR TOURING

One of the most unique vacation stunts reported this summer was that of Frank M. Miller of the Buick truck department, Chicago branch, who has proved that the two cylinder Buick truck also is a pleasure car. Taking Mrs. Miller, his small daughter Dorothy and another family of three members, Mr. Miller hit the trail with a complete camping outfit. For 8 days this land cruising of the Buick with its party of six, flags fluttering in the breezes, and camping outfit indicating its plan, surprised and pleased the populace in the cities, country side and resorts of northern Indiana. In spite of rain, heat and bad roads, the trip was continued, and only twice were hotels sought for refuge. Everybody was delighted and wanted another week in this modern prairie schooner. The last day of the trip Mr. Miller drove the truck from Lafayette, Ind., the women and children of the party returning on the train.

BIG SAVING IN FERRY TOLLS

Owing to its ability to carry heavy loads over steep grades in much less time than horses, the 5-ton Peerless truck operated by the Howell Condensed Milk and Cream Co. of Jersey City, N. J. is reported to be saving its owners over $3,000 a year in ferry tolls alone, in addition to all the usual savings that result from successful motor truck operation.

The company hauls every night a large quantity of milk from Jersey City to a point 2 miles in the interior of Staten Island. The truck makes two trips with 100 forty-quart cans each weighing 110. The present route covers a run of 8 miles from the distributing station at 144 Provost street, Jersey City to the Bergen Point ferry and a run of 2 miles after reaching Staten Island, making a round trip of 20 miles or 40 miles for the night's work. The ferry tolls that are charged against the company are 35 cents for each passage or $1.40 per night.

It was impossible for the teams which formerly did the work to take this route because they could not cover the 10 miles over steep grades fast enough to deliver the milk on time. Two teams used to leave the distributing station and proceed via the Erie Railroad ferry to New York. The toll for this trip was $1 for each team. Across Manhattan it was 1 mile to South Ferry, and the ferry toll from South Ferry to Staten Island was $1.50 for each team. This amounted to $10 per night for two round trips for two teams as against $1.40 for the truck. As the truck works every night in the year the saving is $3,139. The Howell company recently put the truck into double service working it night and day and besides saving these fees, has been doing excellent work.

ALBANY IN MARKET

Fire Chief Bridgeford of the Albany, N. Y. department is planning to purchase within a few months several motor tractors similar to the one now in use in the Schenectady, N. Y., department. Instead of purchasing new motor-driven fire apparatus, Chief Bridgeford figures that two tractors can be bought for the price of one motor wagon and these tractors could be used to draw to fires the present horse-driven chemical wagons and steamers. Chief Bridgeford intends to motorize the Albany department later on but for the present he believes the tractors ought to increase materially the efficiency of Albany's fire system.

MOGUL TRUCK THAT MOVES HOUSES

Current Motor Car Patents

PATENTS ISSUED JULY 23, 1912
(CONTINUED)

1,033,429—Vehicle Spring. Thomas J. Magner, Olean, N. Y.; George A. Larkin, administrator of said Magner, deceased. Filed October 12, 1910. Serial No. 586,778.

1,033,434—Spring Construction. McClellan McIntosh, Allegan, Mich., assignor of two-thirds to Frank A. Ewer and John T. Cloney, Allegan, Mich. Filed January 10, 1912. Serial No. 670,533.

1,033,443—Carbureter. Charles A. Morris and Walter H. Merritt, Red Bank, N. J. Filed March 27, 1911. Serial No. 617,058.

1,033,442—Steering Gear. VanZandt M. Moore, Cleveland, Ohio. Filed March 15, 1911. Serial No. 614,542.

1,033,449—Spark Plug. James E. Murray, Brooklyn, N. Y., assignor to Arthur R. Mosler, New York, N. Y. Filed February 23, 1907. Serial No. 358,803.

1,033,498—Spark Plug Tester. Joseph Valois, Alphonse Groise and Armand Groise, Holyoke, Mass. Filed February 9, 1912. Serial No. 676,523.

1,033,504—Internal Combustion Engine. Morris C. White and Otho C. C. Duryea, Los Angeles, Cal., assignors of one-tenth to James R. Townsend, Los Angeles, Cal. Filed October 20, 1908. Serial No. 458,705.

1,033,508—Apparatus for Controlling the Charge of Storage Batteries. Joseph L. Woodbridge, Philadelphia, Pa. Filed October 11, 1909.

1,033,511—Power Transmission for Motor Cars. Clinton Zimmerman, Worthington, Minn., assignor of one-third to Christ Zimmerman, Worthington, Minn. Filed April 6, 1911. Serial No. 619,391.

1,033,513—Vehicle Tire. Anton Aebli, Milwaukee, Wis. Filed October 6, 1909. Serial No. 521,319.

1,033,514—Rotary Engine. Isaac Alford, Peru, Kan. Filed November 15, 1911. Serial No. 660,477.

1,033,521—Variable Speed Driving Mechanism for Motor Cars. Henry G. Beguelin, St. Louis, Mo. Filed July 24, 1911. Serial No. 640,312.

1,033,556—Motor Truck. Frank H. Doane, San Francisco, Cal. Filed February 23, 1912. Serial No. 679,238.

1,033,560—Lighting System for Vehicles. Louis R. Duval, New York, N. Y., assignor of one-half to Giles C. Gardiner, Weehawken, N. Y., and Lucien Knapp, New York, N. Y. Filed June 1, 1910. Serial No. 564,385.

1,033,572—Signaling Device. Gustave Fortman, Philadelphia, Pa., assignor of one-half to George W. Cook, Philadelphia, Pa. Filed December 14, 1911. Serial No. 665,633.

1,033,599—Variable Speed Transmission Gearing. Charles M. Leech, Lima, Ohio. Filed July 19, 1911. Serial No. 639,328.

1,033,618—Transmission Gearing. Louis Renault, Billaincourt, France. Filed July 20, 1910. Serial No. 572,842.

1,033,635—Tire. William LeRoy Sweeney, Spartansburg, S. C., assignor to Margaret S. M. Sweeney, Spartansburg, S. C. Filed November 7, 1911. Serial No. 659,011.

1,033,645—Spring Wheel. Alfred Strover Williams, London England. Filed August 28, 1911. Serial No. 646,343.

1,033,657—Combined Spring and Shock Absorber for Vehicles. Julian Seay Bashaw, Gainesville, Fla. Filed April 11, 1912. Serial No. 690,079.

1,033,664—Elastic Wheel. Nestor Braibant, Brussels, Belgium. Filed September 25, 1909. Serial No. 519,635.

1,033,665—Wheel. Nestor Braibant, Brussels, Belgium. Filed November 21, 1910. Serial No. 593,536.

1,033,701—Rotary Explosion Engine. Gabriel Iochum, Paris, France, assignor of one-half to Leon Joseph Guitard, Paris, France. Filed October 30, 1911. Serial No. 657,625.

1,033,739—Vehicle Wheel. William C. Sellers, Carlsbad, N. Mex. Filed July 12, 1911. Serial No. 638,196.

1,033,741—Armored Tread for Pneumatic Tires. Bona Sims, Valley Springs, Texas. Filed February 8, 1911. Serial No. 607,325.

1,033,748—Rotary Explosion Engine. Edward K. Standish, Waltham, Mass. Filed November 9, 1907. Serial No. 401,402.

1,033,760—Internal Combustion Engine. George William Hutchinson, Walton, New Zealand. Filed April 9, 1912. Serial No. 689,673.

PATENTS ISSUED JULY 30, 1912.

1,033,783—Gasoline Engine. Henry Collinet, Chicago, Ill. Filed August 6, 1909. Serial No. 511,610.

1,033,786—Magneto Battery Switch. Henry G. Cox, Detroit, Mich. Filed March 16, 1911. Serial No. 614,764.

1,033,886—Carbureter. William M. Gentle, Greenwood, Ind. Filed December 1, 1910. Serial No. 595,137.

1,033,828—Compression Locking Grease Cup. Omer E. Risser and Peter E. McSweeney, Springfield, Mo. Filed October 18, 1910. Serial No. 587,731.

1,033,840—Magnetic Speedometer. John K. Stewart, Chicago, Ill. Filed May 13, 1911. Serial No. 627,069.

1,033,861—Acetylene Gas Lamp. Charles W. Beck, Rockville Center, N. Y., assignor, by mesne assignments, to Oxweld Acetylene Co., a corporation of West Virginia. Filed March 4, 1907. Serial No. 360,332.

1,033,862—Acetylene Gas Generator. Charles W. Beck, Rockville Center, N. Y., assignor, by mesne assignments, to Oxweld Acetylene Co., a corporation of West Virginia. Filed November 4, 1907. Serial No. 400,480.

1,033,863—Acetylene Gas Generator. Charles W. Beck, Rockville Center, N. Y., assignor, by mesne assignments, to Oxweld Acetylene Co., a corporation of West Virginia. Filed February 17, 1908. Serial No. 416,252.

1,033,864—Acetylene Generator. Charles W. Beck, Rockville Center, N. Y., assigor, by mesne assignments, to Oxweld Acetylene Co., a corporation of West Virginia. Original application filed October 23, 1901. Serial No. 79,626. Divided and this application filed December 22,1908. Serial No. 468,830.

1,033,870—Shock Absorber. Ernest S. Bullard, Wheeling, W. Va. Filed August 4, 1911. Serial No. 642,397.

1,033,882—Automatic Starting Device for Internal Combustion Engines. John Desmond, Chicago, Ill., assignor to William S. Potwin, Chicago, Ill. Filed June 15, 1911. Serial No. 633,272.

1,033,886—Carbureter. William M. Gentle, Greenwood, Ind. Filed December 1, 1910. Serial No. 595,137.

1,033,900—Motor-Controling Device. John T. Janette, Chicago, Ill. Filed November 7, 1910. Serial No. 590,968.

1,033,911—Explosion Engine. William S. Lee, Detroit, Mich. Filed January 26, 1911. Serial No. 604,724.

1,033,939—Internal Combustion Engine. William John Robb and Walter Henry Welch, Bristol, England, assignors to Banner Motors Limited, Bristol, England. 1910. Serial No. 558,661.

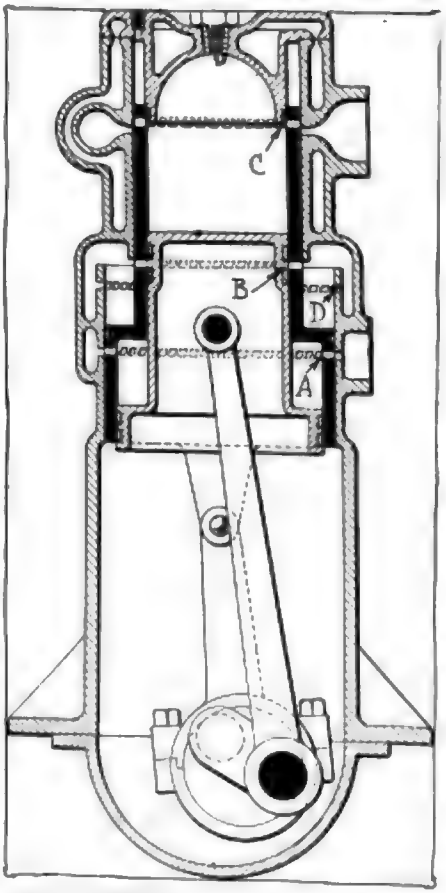

FIG. 1—SLEEVE-VALVE TWO-CYCLE MOTOR

1,033,944—Vehicle Wheel. Rushton, Grimsby, England. 16, 1911. Serial No. 649,68

1,033,976—Agricultural T Zock, Toledo, Ohio, assignor ments, to Archibald B. Cre Filed May 23, 1908. Serial

1,033,978—Automatic St Vehicles. Myron T. Bair Filed May 27, 1911. Serial

1,033,985—Rotary Motor. Washington, D. C. Filed Serial No. 658,818.

1,033,991—Variable Speed ism. Antonio Cotoli, Hab September 18, 1911. Serial

1,034,023—Shock Absorb Mullen and Thomas F. Brent N. Y. Filed July 19, 1911. 316.

1,034,046—Spring Wheel. Spencer, N. C., assignor of o L. Kiser, Spencer, N. C. F 1911. Serial No. 651,659.

1,034,108—Device for Cha teries. Edward A. Halbleib, assignor to Northeast Elect N. Y., a corporation. Fil Serial No. 560,387.

1,034,115—Recoil Check. son, Chicago, Ill. Filed Serial No. 615,212.

1,034,125—Rear End Buff Moise J. Leclerc and Will York, N. Y., assignors to Frederick W. Darnstaedt, Filed September 14, 1910.

1,034,133—Rotary Engin Donald, Swansea, England. 1912. Serial No. 676,140.

1,034,145—Gearing. Arth cinnati, and Oscar Schni Ohio. Filed May 1, 1911.

1,034,146—Gearing. Arth cinnati, and Oscar Schni Ohio. Filed May 17, 1911. 805.

1,034,156—Storage Batter Chicago, Ill. Filed July 2, 505,571.

1,034,157—Storage Batter Chicago, Ill. Filed July 2, 505,572.

1,034,186—Garment. Sa Flushing, N. Y. Filed D Serial No. 599,917.

1,034,190—Tachometer. V Waterbury, Conn., assignor Waterbury, Conn., a corpor cut. Filed May 20, 1912.

1,034,204—Purifier for Ac B. Cobb, Waterbury, Conn. Serial No. 695,164.

1,034,213—Rotary Interna gine. Raymond S. Dickin Cal. Filed September 8, 648,299.

1,034,220—Spring Wheel. Drummond and Austin D Gustine, Cal. Filed Sept Serial No. 649,004.

1,034,231—Shock Absorber Haugh, Millvale, Pa. Filed Serial No. 678,034.

1,034,271—Vehicle Wheel. lop, Alleghany, Cal., assigno Francis Bordiner De Lanne Filed July 25, 1911. Serial

1,034,273—Gasoline Spra Valve, John T. Metcalfe and Quincy, Pa., assignors to Q Quincy, Pa., a corporation Filed March 31, 1911. Seri

1,034,274—Gas Engine St Miller, Oakland, Cal. Filed Serial No. 659,331.

1,034,280—Curtain for V liam T. Murray, Baldwin, K ber 9, 1910. Serial No. 591

1,034,317—Pneumatic Wh man Smith, Topton, Pa. 1911. Serial No. 653,982.

1,034,325—Starting Devi John W. Tudor, Boston, M 14, 1910. Serial No. 549,18

1,034,327—Resilient Wheel Raymond, Minn. Filed Marc No. 687,060.

1,034,349—Transmission Eckhard, Boston, Mass., as Motor Truck Co., Boston, M of Massachusetts. Filed Serial No. 588,237.

1,034,372—Apparatus for Charles H. Semple, Trent March 7, 1911. Serial No. 6

1,034,378—Motor Car V Charles Henry Willard, P

ne-half to Dora Rowley, Gila Bend,
Filed February 11, 1911. Serial No

—Vehicle Wheel. Charles Whitfield
an Jose, Cal. Filed July 8, 1911.
637,445.
—Detachable Rim for Carriage
ouis Jean Claude Guillaume Debais,
nce. Filed June 20, 1908. Serial
9.
—Vehicle Wheel. McClellan Mc-
legan, Mich., assignor of one-fourth
, Cloney, and one-fourth to Charles
le, Allegan, Mich. Filed May 10,
ial No. 626,891.
—Vehicle Spring. Henry Sterling
ckville Center, N. Y. Filed Septem-
11. Serial No. 648,744.
13,450—Starter for Internal Com-
gines. Luther V. Moulton and Pal-
ces, Grand Rapids, Mich. Filed De-
1911. Serial No. 663,876. Original
.061, dated September 26, 1911.
393,671.

ission-Gearing. No. 1,034,349—
hart, Boston, Mass., assignor to
Motor Truck Co., Boston, Mass.
ober 21, 1910, dated July 30,
mprising a selective-type sliding
ncorporated with a differential
haft, this change-gear consists of
shaft mounted with a brake, and
with a master gear which drives
shaft, which is provided with
various sizes, selectively mesh-
corresponding reduction gears
iveshaft by means of two shifter
corporating with shifter yokes
on the drive shaft, with con-
o a manually-operated lever. A
age is arranged to automatically
rake, preventing spinning of the
he time of changing gears. This
f an actuating arm connected to
band, which is controlled by
e shifter rods, any movement of
plies the brake, holding it in
n until its movement has been
, and the gear actuated by the
l in mesh. A bevel gear differ-
r is driven by the driveshaft,
turn drives the divided jack-
whole device, including the
nge-gear and differential being
one case.

Combustion Engine—No. 1,033,-
m S. Lee, Detroit, Mich. Filed
, 1911, dated July 30, 1912.
a two-stroke action with a sleeve-valve port system, this motor is of the double-bore type, having a cylinder of two superimposed bores, lined with a sliding sleeve of the same shape, and a piston of the same form, reciprocating within the sleeve, as in Fig. 1. The two chambers thus divided are respectively a combustion chamber and an auxiliary compression pump. The combustion chamber is provided with a true dome head, in the center of which is the spark plug, the casting being separate from the cylinder body, and cored for the reception of the upper portion of the sleeve and for water jackets.

Cast integrally with the cylinder are water jackets and exhaust passages, provided with slots communicating with the interior of the combustion chamber, above the stroke of the piston. Corresponding slots are cut in the sleeve.

At the center of the stroke of the enlarged portion of the piston are intake passages communicating with the interior of the compression pump through registration with corresponding slots in the sleeve, and connected with the intake manifold. At the top are like ports which admit the gas when compressed to like ports at the bottom of the stroke of the piston proper, which form the inlet valves. The cylinder is connected to the crankshaft by the customary crank and connecting rod action, and the sleeve is operated by an eccentric on the crankshaft which is operated a connecting rod, pinned to the lower portion of the sleeve.

In operation, starting at top dead center, and with a compressed charge in the cylinder, the piston is driven downward by the ignition of the charge by the sparkplug. On the down stroke the sleeve is moved to a point where the intake ports A are opened, and the gases from the carbureter are drawn into the pump by the down stroke of the piston. At the bottom of the stroke these ports are closed and the inlet ports B and exhaust ports C opened by the continued reciprocation of the sleeve, the exhaust gases escaping through the upper ports, being further impelled by the inrush of gas from the inlet ports, under pressure from the corresponding compression in the pump of the mate to the cylinder. The new charge is then compressed in the combustion chamber by the up stroke of the piston, the exhaust ports being closed, and the raw gas in the pump being compressed by the corresponding upstroke of the enlarged end of the piston, the pump exhaust ports D, admitting gas to the adjacent cylinder.

Internal Combustion Motor—No. 1,033,-939—William John Robb and Walter Henry Welch, Bristol, Eng., assignors to the Banner Motors, Ltd., Bristol, Eng. Filed April 30, 1910, dated July 30, 1912. This is a four-cylinder motor, the cylinders of which are set approximately on the four corners of a square, being of the four-stroke type, with valves in the head, and provided with pistons and connecting rods, the latter of which do not connect with the crankshaft. Running longitudinally of the motor, equidistant from the two pairs of cylinders, is a stationary shaft, upon which two walking beams rock. These walking beams are connected at their ends with one each of the connecting rods of the pairs of cylinders, at an angle of 180 degrees. To the center of one side of each walking beam are pivoted other connecting rods which connect in turn with the cranks of a two throw crankshaft.

Magnetic Speedometer—No. 1,033,840—John K. Stewart, Chicago, Ill. Filed May 13, 1911, dated July 30, 1912. In conjunction with a magnetic speedometer of the familiar revolving magnet type, this invention relates mainly to a thermostatic compensator. This consists of constructing the magnetic pole-piece in the form of a split ring, composed of two metals of unequal expansive properties, so linked as to vary the relation between the pole-pieces, for the purpose of correcting the reading as affected by changes in size due to expansion and contraction as induced by changes in temperature.

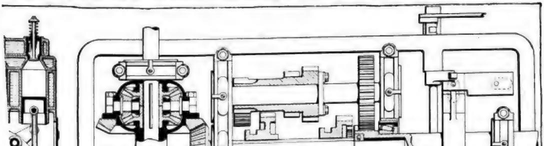

FIG. 2—BRITISH WALKING BEAM MOTOR AND HERCULES GEARSET

From the Four Winds

R. C. H. TESTERS PLOW THROUGH SAND

LAC in Long Race—The 1913 illac was the first car to be en the Los Angeles-Phoenix road Don Lee belongs the honor of he first entrance fee in the hands S. Mitchell.

d to a Sociability Run—The an of the Automobile Manufactur Dealers' Association of St. Louis a sociability event instead of a . Owners will be invited to party on the tour, which proba be August 22, 23 and 24. The l likely be from St. Louis to and return.

League Growing—The Ontario ague of Canada is organizing for cial educational campaign for ds. During the past year the ip of this organization is in at the rate of 40 per cent, and pected that 2,000 motorists will rolled before the expiration of nt season.

in New York Tags—License plates issued by New York state will be different than those now d. Besides the figures "1913," g the year in which they are he new plates will have the word rcial" on plates intended for ial motor vehicles. The state's or a commercial license is $5, om $5 to $25 is charged for pleas cles, according to horsepower of Heretofore owners are said to ured pleasure plates at commer rates, thereby saving many dollars. Manufacturers' plates used by dealers will continue to bear the letter "M." The 1913 contract calls for a supply of 90,500 pairs of license number plates.

Penn Busy Building Roads—One thousand miles of highway built since the state began its present road improvement system will be what Pennsylvania can show as the progress in highway work made by the Keystone state at the end of this year.

Cincinnati Chosen—The invitation extended by the mayor and the Commercial Association of the city of Cincinnati to the American Road Builders' Association to hold its ninth annual convention in that city has been accepted. The convention and the good roads congress, which is always held in connection with the convention, will therefore be held in Music hall, Cincinnati, December 3, 4, 5 and 6. This convention will bring together the leading road builders of United States and Canada.

Want Money for Roads—Members of the Indianapolis city council have been asked by the board of park commissioners to increase the tax levy for park and boulevard purposes from 7 to 9 cents on each $100, in order to hasten the completion of the board's boulevard scheme. The increase would amount to about $120,000 a year. The boulevard scheme outlined by the board includes about 200 miles of paved driveways, mostly along the stream banks of the city. One scheme now under way is widening Thirty-eighth street for a distance of 3 miles to a uniform width of 100 feet. This will cost about $500,000. About half of the work on Thirty-eighth street is now under way.

Would Use Motor Sprinklers—The city authorities of Indianapolis have under consideration the adoption of motor equipment in the street cleaning department, to include several motor-driven sweepers and sprinklers. Owing to the large amount of improved streets, the street cleaning is becoming a serious problem, considering the limited amount of money at hand. Experiments have recently been made with a motor sweeper with fairly satisfactory results. Concerns manufacturing such apparatus are being communicated with by the board of public works.

Ultimation by Uncle Sam—Rural mail delivery service has been temporarily suspended in a portion of York township, near York, because of the unsafe condition of the road which route No. 12 from the York office traverses. Postmaster S. S. Lewis, of York, Pa., has been advised by Fourth Assistant Postmaster General P. V. DeGraw that the rural service of this section of the county be discontinued, and steps will be taken by the department to permanently discontinue the service in all sections of the county where the highways are not kept in repair for travel.

Rochester Wants Parking Square—Rochester, N. Y., business men are trying to arouse official action in the matter of providing for motorists a public parking place for cars, or they declare the city ought to secure a block of property in the downtown section of Rochester, pave it with asphalt and in the center of the block form a lawn or miniature park with cars to be ranged along each side. The protest is a direct outgrowth of the recent ordinance enacted at Rochester forbidding motorists to leave their cars standing in busy streets or in front of offices for more than 10 or 15 minutes, 5 minutes being the limit in the busiest sections.

Slowing Milwaukee Motorists—To stop speeding on the famous Blue Mound road, running westerly from Milwaukee and the principal western exit from the city, the Milwaukee county board of supervisors has adopted a resolution making a speed limit of 20 miles per hour on all roads in the county, excepting within the limits of cities and villages. The county ordinance is claimed to be illegal by well versed attorneys, who point out that the state law fixing the limit of speed on country highways at 25 miles per hour cannot be superseded by any local enactment whatever. The law states specifically that no unit of the government may enact any ordinance or law which interferes with the state law on this question.

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is expected that the Milwaukee Auto obile Club will invite test suits. Its ubhouse is situated on the Blue Mound ad.

nnesotans on Run—The St. Cloud utomobile Club, of St. Cloud, Minn., had reliability run August 7-8, spending the ight at Glenwood and returning through lexandria and the lake park region of Minnesota. Short stops were made at ld Spring and Richmond, arriving at aynesville and running over to Lake oronis for luncheon. In the afternoon ops were made at Brooten and Belgrade. he second day stops were made at Osakis nd Sauk Centre, Melrose and St. Joe.

ong Tour Completed—Dr. S. S. Crow nd A. Faulkner, of Los Angeles, have ust completed a motor car trip from that ity to New York. The two men took the rip as a vacation in Dr. Crow's 48-horsepower Pierce-Arrow runabout. They made o attempt to establish any records, but topped at several places for visits with riends and relatives and for sightseeing. hey left Los Angeles on June 5 and arrived in New York on July 8. Of this ime they spent 17 days on the road.

ortland-Seattle Record Broken—First [illegible] by George Johnson with a adillac then won by R. P. Rice, with a [illegible] again taken with a Ford by Leon McIntire, all three motors being of [illegible] the Chanslor & Lyon trophy has [illegible] farewell to Seattle during the past [illegible] and became the temporary property [illegible] Baldwin, of Tacoma. Baldwin [illegible] at 4:15 a. m. and arrived in [illegible] at 11:40, having knocked just 41 [illegible] of the schedule.

isconsin Road Report—Incomplete re [illegible] by the Wisconsin Highway [illegible] from counties throughout the [illegible] that [illegible] will be ex [illegible] highway improvement of a [illegible] nature during 1912. The state [illegible] requires all counties to make re [illegible] for the following year's work by [illegible] in order to draw state aid. [illegible] approximately $1,[illegible] is [illegible] expended, and this amount is re [illegible] as immense when it is considered [illegible] is the first year of the opera [illegible] of the state aid law which allows [illegible] state aid annually.

isconsin Registrations—The total reg [illegible] of motor cars in Wisconsin on [illegible] 1912, was 21,194, not including [illegible] issued to dealers. The total [illegible] of the registration department [illegible] secretary of state's office were [illegible] which besides [illegible] motor cycle [illegible] at $2 each. Motor car registra [illegible] made at the rate of $5 each. The [illegible] of administration was $15,[illegible] a balance of $[illegible]. Of this [illegible] 75 per cent, or $79,164.35, is re [illegible] pro rata to the various counties in [illegible] and the remaining 25 per cent, [illegible] is placed into the good [illegible] state aid for highway improve

ment fund. Milwaukee county will profit most, receiving $17,420.82 of the 75 per cent return distribution.

Club Working on Road—The Burlington Automobile Association of Wisconsin has elected these officers: President, Benjamin Holmes; vice-president, Dr. W. A. Fulton; secretary, C. E. Partee; treasurer, Dr. F. Meinhardt; director, Henry Wehmhoff. The association has decided to take up highway improvement of its own accord and appropriated $1,000 for the work. A team of horses and two men are now going over all of the roads leading out of Burlington, for a distance of 5 miles, to rake loose stones from the roadway, fill chuck holes and line up approaches to bridges and culverts.

Defendants Must Appear — Judge Bruce, of the Malden, Mass., district court, has read a lecture to the police of that city for assuming to tell motorists arrested for speeding that they could enter an appearance through their attorneys, instead of appearing themselves and plead nono nolo contendre. The men so notified were ordered to appear before the judge so that he could hear what they had to say, as he believes that in making them come into a court of justice the seriousness of their offense will be impressed upon them more forcibly and they may be more careful in future.

Blue Books for President Taft—It is not likely that President Taft will be lost during his numerous motor car trips around the country. Last week he was presented with a full set of Blue Book routes by LeRoy Mark, vice-president of the southeastern division of the Touring Club of America, President Taft being an honorary member of the organization. The president informed Mr. Mark he would turn the books over to his son, Charlie, who takes a great interest in motor car touring, and the president will depend upon his judgment in laying out some interesting trips. President Taft informed Mr. Mark he had found the 1911 Blue Book routes of much value and that the 1912 editions would be carried in the White House motor cars whenever he was making a tour.

Bars Ex-Convicts as Chauffeurs—In his next annual report, Secretary of State Lazansky, of New York, will suggest that ex-convicts be barred from securing licenses to drive motor cars, as several crimes have resulted by the chauffeur's co-operation with criminals.

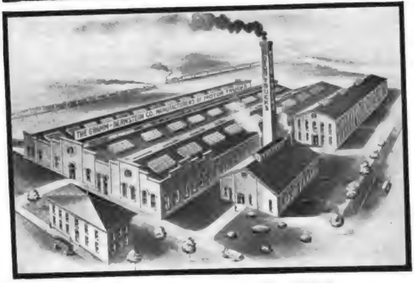
Park Still Closed—Despite the requests of several California congressmen that motor cars be allowed in Yosemite park this year, Secretary of the Interior Fisher has ordered that motor cars be not allowed in the park. The action was taken because the superintendent of the park reported that it would be dangerous for cars to use the narrow and deep roads.

Woman Building Roads—Miss Eva Cressy, daughter of Walter Cressy, a Gloucester, Mass., contractor, enjoys the distinction of being the only woman road builder in New England. Miss Cressy has just had completed, under her direction, one of the finest pieces of highways in the Bay state. She has been on the job every day in all kinds of weather, directing the work of thirty-five men while her father has been absent.

Buffalo Counts Cars—Statistics just issued by the bureau of engineering of Buffalo, N. Y., show that at the corner of Main and Tupper streets, which corner has the greatest traffic in Buffalo, 4,451 motor cars and motor trucks each day passed this corner during the month of June, while during the same time 1,262 horse-drawn vehicles passed the same point. During the month of June 2 years ago at the same corner the average number of motor cars passing every day was 2,247, while 1,353 horse-drawn vehicles were checked up daily at this busy corner, which figures indicate the increasing popularity of the motor in Buffalo.

J. J. HOBERG'S PRIZE-WINNING PIERCE IN GREEN BAY, WIS., PARADE

Among the Makers and Dealers



NEW FACTORY OF GRAMM-BERNSTEIN CO. AT LIMA, O.

NYBERG Gives a Banquet—To celebrate the return of the Nyberg truck from the four-state tour, a banquet was given the employes of the Nyberg company at Anderson, Ind.

Add to Stock—Increases in the capital stock of two Detroit concerns were recorded during the past week. The capital stock of the Detroit Body Co. was increased from $1,000 to $1,000,000, while that of the Wolverine Motor Supplies Co. was raised from $25,000 to $50,000.

Anderson Makes a Change—R. C. Anderson, vice-president of the J. I. Case Plow Co., of Racine, Wis., has resigned to assume the position of general manager of the reorganized Simms Magneto Co., of New York. Mr. Anderson has been associated with the Racine concern for many years.

Keeton Invades Canada—The Keeton Motor Co., of Detroit, Mich., announces the formation of the Keeton Motors, Ltd., of Canada, with headquarters and factory at Brantford, Ontario. The Keeton Motors, Ltd., is incorporated at $200,000 all paid up and has secured a plant at Brantford, Ont., with 30,000 square feet of floor space. It will manufacture 350 cars for this season's requirements, taking care of the Canadian, English, and colonial business. The officers of the company are: F. M. Keeton, president; J. B. Detwieller, of the Canadian Steel Co., vice-president and treasurer; W. G. Houck, vice-president and sales director; E. Sweet, of Brantford, secretary. W. J. Verity, president of the Verity Plow Co., and Percy E. Verity, also of the Verity Plow Co., are large stockholders and directors. The company will manufacture a six-cylinder 48-horsepower French-type car, following the Renault lines.

Unique Underslung Demonstration—An accompanying illustration shows the display used by the St. Louis agents of the American Motors Co., of Indianapolis, to demonstrate just how far the American underslung can be tipped without turning turtle. The car as it stands is tilted to an angle of 55 degrees. In placing this car in the position shown, it was raised to an angle of 60 degrees and still did not turn turtle, it is declared.

To Make Foreign Machine—The Sheboygan Machine Co., recently organized by former associates of the Falls Machine Co., of Sheboygan Falls, Wis., has been granted the American rights to the manufacture of a bronzing machine patented in Germany. The latest model of the machine has been received at Sheboygan and will serve as the pattern for the large number of machines which the new company intends to build for the American trade.

Starting New Engine Company—The Leech Automobile Co., of Lima, O., which was incorporated 3 years ago for the purpose of carrying on experiments with a new style of gasoline engine, is now ready to erect a plant for the manufacture of the engine. In the past 3 years the concern has secured patents on fifteen different devices. The capitalization has been fixed at $100,000. The officers of the company are Charles M. Leech, president; H. H. Hughes, vice-president; Frank Leech, secretary; A. M. Kelchner, treasurer, and H. W. Allen, general manager. In addition to manufacturing engines, the company will also make a line of parts for motor cars and commercial vehicles. It is believed the plant will be located at Lima.

Swinehart Has a Picnic.—The Swinehart Tire and Rubber Co., of Akron, O., gave its annual outing to its employes at Cedar Point, August 3. A special train carried thousands of employes to the point.

Making the Shur-Go Self-Starter—Announcement has been made by the Shur-Go Starter Co. that it has purchased the patents and equipment required in the manufacture of starters, and contemplates the manufacture of the device in New York. It is stated by the company that deliveries will be made by September 1. The officers of the new organization are: James E. Taylor, president; W. G. Rand, vice-president and general manager, and E. Chamberlain, secretary and treasurer.

Hawkeyes Ready for Show—Iowa's big summer motor show is only 2 weeks away. The show, which is to be one of the features of the Iowa state fair, will be held the last week in August under the great steel amphitheater at the fair grounds at Des Moines. The space has been entirely sold for weeks, and the biggest show in the history of the state fair is expected. W. E. Moyer, president of the Des Moines Dealers' Association, who is one of the managers of the state fair show, has been dangerously ill the past 2 weeks with typhoid fever, but his associates have carried on the work preliminary to the opening of the show.

To Call Them Studebakers—The Studebaker Corporation of Detroit has sent notice to its dealers all over the country that, in the future, all the motor cars built at its Detroit plants will be known as Studebaker cars. The change went into effect with the opening of the current month. A big battery of machine tools is now engaged in turning out the initial lot of 100,000 Studebaker script radiator name plates which will replace those at present in use, not only on the cars now being marketed, but also on all cars sold by the Studebakers and their predecessors, the E-M-F Co., which was merged into the Studebaker Corporation some time ago. As soon as it is possible to supply the monograms to Studebaker dealers, all cars now in use will be equipped with them. The change is declared to be logical. Since the beginning of the motor plants around which the present Studebaker system has been built, members of the Studebaker family have been heavy stockholders. Two years ago they acquired a controlling interest. The motor plants are now owned outright by the Studebaker Corporation. Practically

blocks of the main part of the city, the real estate itself being very valuable. The machinery will be installed the coming month, and the factory will be in full operation by October 1.

Packard's Big Shipments—The Packard Motor Car Co. in the 2 weeks ending July 31, shipped 255 cars whose total value was $1,275,000, cars leaving the factory at the rate of twenty a day. Fifty-six trucks were sent out in the same time, their value being $196,000.

Increasing Aluminum Plant — The American Castings Co., of Mishawaka, Ind., has just installed new equipment, including moulding machinery, pneumatic tools and other apparatus. It is also erecting an addition to its plant and has taken on a number of men in the mechanical department. The company manufactures aluminum castings.

Plan to Show at Fair—Dealers in Columbus, O., and some of the manufacturers of both pleasure cars and motor trucks are preparing to have a large exhibit at the Ohio state fair and Columbus centennial celebration, which will be combined and will take place August 26 to 31. At the Ohio state fair in 1911 the motor display was especially large and results secured were very gratifying. It is believed a large number of cars will be on display at the coming fair.

Akron Day Carded.—One of the features of the international rubber and allied trades exposition which will be held in New York city September 23 to October 3, inclusive, will be Akron day, which will be devoted exclusively to exploiting the rubber industries of Akron, O. All of the leading rubber manufacturers of Akron will be represented upon that day by a special display. Some of the Akron concerns plan to send several hundreds of their employes to the show to study the various methods of manufacturing and machinery used. The exposition is to be given under the auspices of the rubber-producing countries of the world, manufacturers, makers of machinery and allied trades.

Considering La Crosse—W. L. Tust, of Dubuque, Ia., president of a new independent oil company, has been inspecting sites at La Crosse, Wis., for the $25,000 plant which the company proposes to establish. The new concern looks with favor upon La Crosse and it is taken as a certainty that the headquarters will be established here.

Atlanta Talking Show.—The success of the November show of the Atlanta Automobile Association is assured, it is declared. The show dates—November 16 to 23—are the best that could possibly be arranged for Atlanta, for at that time the weather is at its best. November has been declared by scientists to be the best month in the year.

Addition to Rambler Plant—Nine acres of ground adjoining the present holdings have been purchased by the Thomas B. Jeffery Co., manufacturing Rambler cars, at Kenosha, Wis., to provide for future extensions. The increased output planned for 1913 will necessitate several enlargements, which will be made in the course of the coming six months.

United States Tire Co. Moves—The general offices of the United States Tire Co. have been moved to the new United States Rubber building, Broadway and Fifty-eighth street, New York. The building is twenty stories high. The United States Tire Co. will occupy the basement and sub-basement as a stock room; the ground floor for its New York branch and the fifteenth, sixteenth and seventeenth floors as general offices. The company has over 400 employes in its general offices. The New York branch store will be moved into the new quarters soon.

AMERICAN DEMONSTRATION OF UNDERSLUNG PRINCIPLES

Development Briefs in Accessory Field

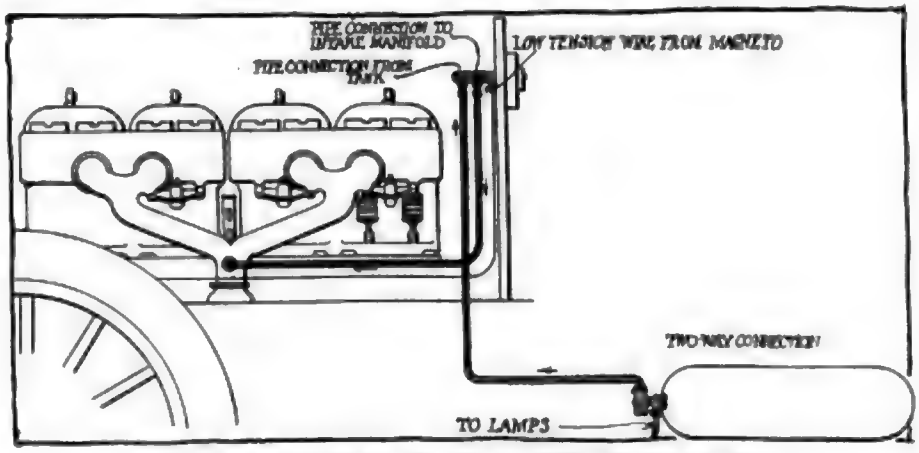


FIG. 1—COMBINATIONS OF THE BLITZEN ENGINE-STARTER

Taximeter Cash Register

TAXIMETERS that automatically print and hand out a slip showing the fare is the invention of Walter Lewin, a California man. The device is known as the Columbia taximeter, and is being marketed by the Columbia Taximeter Co., San Francisco, Cal.

The instrument is entirely automatic, and no reading is possible save from a printed ticket, similar to a cash register receipt, which is presented the passenger at the end of the ride. The machine is simple in construction, being built in two units, viz., the registering device and the recording device. The registering unit is controlled only by the tariff lever, every movement of which leaves a printed record on a duplicate tape, and discharges a ticket through a small chute. The record is accessible only to the proper authorities, showing time, distance, and fare due. The machine may be made to record single tariff, double tariff, and on the $3.50 and $4.00 per hour basis.

The duplicate ticket device contains two rollers, one for the blank ticket and duplicate strips, and the other for the duplicate record. The figures to be printed are in relief type on the registering wheels, the blank strips and ribbon being stretched parallel to them and brought into contact at the movement of the tariff lever, by a set of blank hammers. A facsimile of the ticket discharged appears herewith, the passenger pays what appears as the total fare, and an accurate and unalterable record is retained as a check on the chauffeur's honesty.

The entire device is enclosed and is extremely simple, with no delicate parts. The only controls are the tariff handle and the dating knobs. An accurate and unalterable record is thus kept of the cab's performance, showing plainly the time consumed in trips, empty returns, and on stand; the number of productive and unproductive miles traveled; and the correct total of fares received. This protects the owner of the cab, and the printed receipt protects the patron, and raises the chauffeur above suspicion. The meter is driven by the customary flexible shaft.

Bayne Sleeve-Valve Motor

External sleeves are the feature of the Bayne valve mechanism. The valves are located in side pockets on either side of the cylinder, similar to the T-head type

H M	
3 45	*Time—Cab Dismissed*
3 20	*Time—Cab Hired*
1 29 12	*Date—Month, Day, Year*
MILES TRAVLD.	
6 6 5 2/5	*Mileage—Cab Dismissed*
6 6 0	*Mileage—Cab Hired*
TOTAL FARE	
0 3 0 0	*Amt. to be Collected*
0 0 4 0	*Initial Fare*

FIG. 2 SAMPLE RECEIPT FROM TAXIMETER

of motor, except that the pockets are shorter and wider, permitting a dome-shaped cylinder head, whose advantages are well known. The water jacket is situated between the sleeve and the cylinder wall, and is enclosed in an outside hood, to which the manifolds are bolted. Unlike the Knight engine, it employs but one sleeve, made of seamless drawn pipe, turned to ⅛-inch thickness, and actuated by a cam and rocker mechanism, on a half-time cam-shaft, instead of by an auxiliary crank-shaft, as are the Knight sleeves.

Referring to Fig. 4, showing a section through the crankshaft and cylinder, D is the sliding valve, sliding in space B, outside of the cylinder casting proper C, and slotted on the right for the inlet and on the left for the exhaust. This sleeve is actuated by the levers J and E, which are acted on by the eccentric I. The lever E rocks on a bearing at E, and is jointed to

Taximeter Which Gives Fare Receipt—Blitzen Single-Sleeve-Valve Motor

J at its opposite extremity, which in turn is coupled to the sleeve. A roller on lever E is pressed against cam I by a heavy coiled spring. The shape of the cam is such that on the exhaust stroke the sleeve is raised until the exhaust slot comes opposite the exhaust port in the cylinder, and during the suction stroke, it is dropped until the inlet slot registers with the inlet port, and holding the sleeve midway between these positions during the compression and combustion strokes.

Due to the generous size and relatively slow action of the spring, there should be no lag in its action, and consequent faulty timing, as with the springs of poppet valves. The outside location of the sleeve offers the advantages of improved cooling, of both cylinder and valves, a minimum of friction, and the elimination of uneven expansion and contraction of parts within the cylinder. The design shows simplicity and accessibility, all

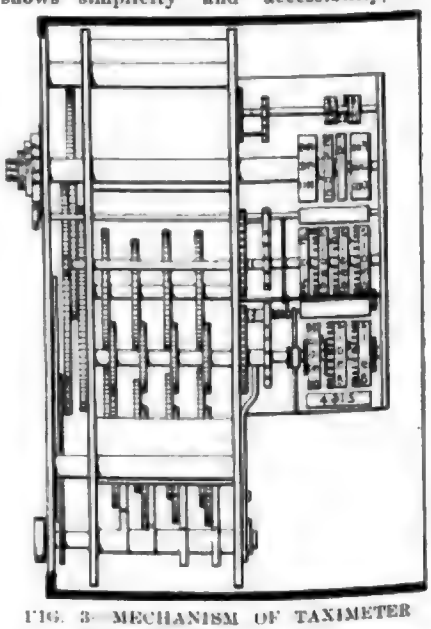


FIG. 3—MECHANISM OF TAXIMETER

working parts being completely enclosed and lubricated. John Bayne, of Wheeling W. Va., is the inventor.

Blitzen Self Starter

In Fig. 1 is illustrated the Blitzen starter which is of the manifold type, drawing in a charge of acetylene gas on the dying revolutions of the motor, and starting on the spark. It is one of the simplest starters that has yet appeared, consisting of two lines of tubing, one leading from the gas tank to a small starter handle on the dash, the other, from thence to the manifold; and a short-circuiting wire to the low-tension wire of the mag-

Vovelties for Use of the Motoring Public

proved Steam Vulcanizer—'wo-Point Spark Plugs—New Exhaust Horn

FIG. 5—PLAN VIEW OF BAYNE ENGINE

In operation, the engine, when ıed is short-circuited by a turn of the er handle, and a charge of gas is n into the engine through the mani- pipe on its dying revolutions. In ng, the battery switch is closed, and ıgine starts as on compression. There hing in sight except the small brass r handle, and no moving parts. 'e to start can only result from poor ' faulty ignition.

Spark Plug

'burg Brothers, of New York, are im- ; the Lodge spark plug of English acture. These are made in both and double-pole type. With double- ugs connected in series with stand- ıgs of any make it is stated that a nt ignition may be obtained by of the standard Mea magneto.

ed Steam Vulcanizer

nproved steam vulcanizer is being l by the Meili-Blumberg Co., New ı, Wis., the principal features of onsist of an attached sliding hinge nd a solid pad, instead of the usual

The clamps are made of a stiffer han the ordinary malleable type, s claimed that they are superior reason. They are permanently at- ɔ the frame of the plant, and be- this fact and their convenient ınd hinged features, they should 'h time where time is most valu- ıe solid pad is also a good fea- here is no tiresome pumping up re to be done, and there is no ' bursting, with resultant ruin of

The boilers are tested to 150 ressure, and it is claimed that rate very quickly.

These plants appear in two models, known as BB and EE. The former of which has a capacity of ten tubes at a time, and five casings, while the latter can

FIG. 6—MEILI-BLUMBERG VULCANIZER

accommodate one casing and one tube at a time.

New Exhaust Horn

Latest among motor car signals is the exhaust horn recently designed by A. Williamson, Atlantic, Iowa. Its chief feature is that the gas pressure from the exhaust is made uniform so that a continuous uniform sound may be produced by the horn and the same result is accomplished when the engine is running slow or high speed. The feature of the device consists of a storage tank 30 inches long and 6 inches in diameter which acts as a pressure equalizer to give the continuous blast. The tank is not intended to enable the operator to blow the horn when the engine is not running but merely to equalize the gas pressure.

High-Grade Brake Lining

Multibestes is the name of a brake-lining manufactured by the Standard Woven Fabric Co., of Worcester, Mass. It is composed of woven asbestos, interwoven with brass wires, and is so woven on special looms that there are no threads or layers. It is treated with an original compound, which completely saturates and impregnates every interstice of the material. It is put through a special process to provide a perfectly true and even surface and thickness, and is said to take hold gently but with a steady, even pressure that is very positive. It is said to be heat, water, dust and oilproof and to possess great wearing qualities. It is said to be non-glazing and easily machined. It is adaptable not only as a brake lining, but may also be used as a clutch facing.

Green's Acetylene Condenser

One of the frequent causes of trouble with acetylene lights is the carrying over of water from generator or tank to the burners. This results in flickering lights and choked tubes. The Alexander Motor Supply Co., San Francisco, is marketing an arrangement called Green's condenser and light intensifier which is designed to be interposed between generator and tank or gasoline piping to remove the water and other impurities from the gas and at the same time act to a certain extent as a pressure regulator. It is made in two different forms, one for attachment to the generator and the other to gas storage tanks.

FIG. 4—CONSTRUCTION OF BAYNE SLEEVE-VALVE MOTOR

Brief Business Announcements

Recent Agencies Appointed by Pleasure Car Manufacturers

Town—	Agent	Make
Albany, N. Y.	James N. Kemp Mach. Works	R. C. H.
Almont, Mich.	Charles B. Scully	R. C. H.
Atchinson, Kan.	George E. King	R. C. H.
Bessie, Okla.	Bessie Mercantile Co.	R. C. H.
Bloomington, Ill.	J. E. Hatfield	R. C. H.
Booneville, Mo.	H. E. Sombert & Son	R. C. H.
Boston, Mass.	Roberts & Sherborne	American
Brockton, Mass.	William F. Holmes	R. C. H.
Brookhaven, Miss.	J. W. Day	R. C. H.
Buffalo, N. Y.	A. Judson Wells	R. C. H.
Buffalo, N. Y.	Barrett Motor Car Co.	Paige
California, Mo.	O. E. Houser	R. C. H.
Caseville, Mich.	C. Crawford & Son	R. C. H.
Center City, Minn.	G. Lorens	R. C. H.
Chagrin Falls, O.	Carl W. Patch	R. C. H.
Chicago	Hustis Brothers	Borland
Chicago	A. Vincent & Son Co.	R. C. H.
Chicago	John Rehm	R. C. H.
Cleveland, O.	Eiseman Automobile Co.	Apperson
Cleveland, O.	Western Reserve Motor Car Co.	Standard electrique
Crown Point, Ind.	Meeker & Clausesen	R. C. H.
Colo. Springs, Col.	Russel Gate Mercantile Co.	R. C. H.
Des Moines, Ia.	Independent Auto Co.	Locomobile
Des Moines, Ia.	George F. Lichty	Petrel
Fort Plains, N. Y.	Philip Marsh	R. C. H.
Fort Wayne, Ind.	Randall Motor Car Co.	R. C. H.
Greencastle, Pa.	Petrie & Morganthall	R. C. H.
Hugo, Okla.	George W. Chandler	R. C. H.
Kansas City, Kan.	A. Garnier	R. C. H.
LeSueur Cr., Minn.	Louis Prchal	R. C. H.
Lumberton, Miss.	Hinton & Byrd	R. C. H.
Lynn, Mass.	C. E. Whitten	R. C. H.
McCool, Ind.	Robbins & Johnson	R. C. H.
Macon, Ga.	Macon Garage Co.	Moon
Milbank, S. D.	Farley Auto Co.	R. C. H.
Minerva, O.	Minerva Hdw. Mfg. Co.	R. C. H.
Moline, Ill.	Ferdinand Crosby	Velie
Morgan, Minn.	George H. Thompson	R. C. H.
New Orleans, La.	H. A. Testard	Hudson
New Richm'd, Wis.	Bell & Webster	R. C. H.
New Ulm, Minn.	Meuller & Aab	R. C. H.
Peotone, Ill.	Henry Koenning	R. C. H.
Pittsburg, Pa.	James Jepson	R. C. H.
Pittsfield, Mass.	Louis L. Larrouche	R. C. H.
Pleasanton, Kan.	Arthur L. Thomas	R. C. H.
Pomona, Cal.	T. Clark	R. C. H.
Plymouth, Pa.	Frank Martz	R. C. H.
Red Lake Falls, Minn.	Findeisen Auto Co.	R. C. H.
Richmond, Va.	W. C. Smith & Co.	R. C. H.
Rosenberg, Tex.	Rosenberg Motor Car Co.	Moon
Salem, Va.	M. L. Shanks	R. C. H.
Salem, Mass.	Motor Sales and Service Co.	R. C. H.
Seattle, Wash.	W. A. Wicks	Franklin
Seattle, Wash.	Olympic Motor Car Co.	Detroiter
Sioux City, Ia.	Bennett Auto Supply Co.	Moon
Shreveport, La.	Orme Motor and Transfer Co.	R. C. H.
St. Clair, Pa.	S. H. Daddow	R. C. H.
St. Louis, Mo.	Cochrane Motor Sales Co.	Cartercar
Watertown, N. Y.	Wolf Auto Co.	R. C. H.
Webb City, Mo.	M. H. Wood & Co.	R. C. H.
West Chester, Pa.	George J. Moses	R. C. H.
Wheaton, Ill.	E. M. Ferry	R. C. H.

PLAISTOW, N. H.—The garage built for J. W. Peaslee at Plaistow, N. H., has just been finished.

Methuen, Mass.—The garage built for Philip Le Page on Lowell street, was opened for business last week.

Cleveland, O.—W. H. Atkinson, of the Windermere garage, 13560 Euclid avenue, has closed for the agency of the Sanford truck.

Philadelphia, Pa.—In addition to maintaining a shop at 1331 Mount Vernon street, George Meeley has established a tire sales office at 702 North Broad street.

Dallas, Tex.—The Studebaker Automobile Dealers of Texas have organized with the following officers: B. C. Nettles, Waco, president; A. P. Mitchell, Ft. Worth, secretary and treasurer; H. C. Mosehart, Houston; R. C. Flick, Cuero, and J. W. Collins, San Antonio, trustees. The stated object of this organization is that the Studebaker dealers of Texas may co-operate for the further distribution of the cars in the state.

Detroit, Mich.—H. L. Keats, formerly with the Chalmers company, has just been allotted the last large territory of the Briggs-Detroiter Co., with headquarters at Portland, Oregon. The Briggs-Detroiter concern is also extending its field to South America, a number of representatives on that continent being already chosen. The Brazil territory has recently been closed with Stephen Schaefer of Rio de Janeiro, who will be known as manufacturer's representative. Gilbert Livingston, formerly connected with the Cleveland sales branch of the Packard Motor Car Co., has been made assistant to Mr. Briggs of the Briggs-Detroiter Co. in the sales department.

New Bedford, Mass.—Murray O'Neil has sold his interest in the Knickerbocker garage on County street, New Bedford, Mass., to Mark E. Sullivan, of the firm of J. B. Sullivan & Son.

Syracuse, N. Y.—Ferd Crosby, who now owns the garage at South State and Cedar streets formerly occupied by the Kerr-Doane Motor Co., and the American Sales Motor Co., is to build a three-story addition to the structure, installing an elevator of 10 tons capacity.

Syracuse, N. Y.—Arthur E. Wheeler, formerly employed by the Franklin Automobile Co., has opened a garage and salesroom in the building formerly occupied by A. M. Zimbrich. He will handle the Stoddard-Dayton and Haynes pleasure cars and a line of trucks.

New Orleans, La.—H. A. Testard, who for 7 years has handled the Cadillac line in New Orleans, has now taken on the Hudson and on account of the increase in business has made a long term lease of a new building at the corner of 353 Baronne to 901-915 Perdido street.

Hartford, Conn.—The Stevens-Duryea line will be represented at Hartford, Conn., beginning about October 1, by H. M. Parsons, who will go there direct from the factory at Springfield, Mass. Fred W. Dart, of the Palace Auto Station, has given up the Thomas agency and will confine his efforts to the E-M-F and Flanders and the Waverley electric. George D. Knox at 210 Pearl street, has discontinued his agency for the Hudson and will give all his time to the Peerless and the Broc electric.

Syracuse, N. Y.—The James Automobile Co., of which Fred Benson is manager, has taken the agency of the Little Four.

Sanford, Me.—Charles Lord, who has taken on the agency at Sanford, Me., for the Peerless, Pope-Hartford, Stevens-Duryea, Chalmers and Paige-Detroit cars, has opened salesrooms and a service station on Mechanic street.

Indianapolis, Ind.—After 4 years with the Indianapolis sales branch of the Buick Motor Co., L. H. Conde has resigned to become associated with R. H. Losey, general sales manager of the Republic Motor Car Co., with headquarters in New York city. Mr. Losey formerly was identified as general manager with the Indianapolis Buick sales branch.

Indianapolis, Ind.—Capitol avenue is rapidly becoming a motor row, due to Carl G. Fisher having built several handsome salesrooms and garages on this avenue. These buildings are all of modern structure. Nine buildings have been built and another is under construction. Sixteen motor firms are housed on this row in Fisher's buildings besides other companies that have structures of their own. The National branch there has just been remodeled and refinished. The total floor space occupied by these sixteen firms amounts to 180,000 square feet. Six tire companies are on this row occupying 53,000 square feet of space. One top company, one carbureter factory, one

battery factory, and several agencies for carbureters, speedometers, shock absorbers, magnetos, self-starters, etc., have offices along this avenue.

Worcester, Mass.—The executors of the Thomas Tracey estate have been granted permission to build a garage on a part of the property on Mayfield street.

Hudson, N. Y.—The Warren Street Garage Co. has incorporated with capital of $3,000, directors being John T. and Henry B. Hester and Dennis Hester, Jr.

St. Louis, Mo.—The 'Detroit Electric Car Co. has been formed in St. Louis to take over the business of the branch, which has been discontinued. W. F. Siegmund, former branch manager, is at the head of the new concern which is located at 5191 Delmar boulevard.

South Bend, Ind.—V. E. Paxson, S. W. Nicholson and J. C. Paxson have organized the South Bend Auto Body Co. here, and a factory will be established immediately for the manufacture of motor car parts and bodies. The concern has been incorporated with an authorized capitalization of $20,000.

Dallas, Tex.—G. A. C. Halff, of San Antonio, former manager for the Stoddard-Dayton Automobile Co. in Texas, announces the organization of a company to handle the Chalmers, Flanders electric, Mack, Sauer and Federal trucks, operating under the name of the Halff company. Headquarters for Texas have been established at Dallas.

Indianapolis, Ind.—The Indianapolis sales and Indiana distributing branch of the Diamond Tire Co. has moved to 431-433 North Capitol avenue, Motor Row, Indianapolis. A new three-story building has also been completed at Capitol avenue and Michigan streets, and has been occupied by the sales branch of the Goodyear Tire Co.; the Carl Fisher Co., which has the agency for the Stutz and Packard; the Archey-Atkins Co., distributor of the Pierce-Arrow, Detroit electric and Hudson and the Ideal Motor Car Co.

Cleveland, O.—The Eiseman Automobile Co., 2025 Euclid avenue, distributor for the Imperial, has taken the agency for this district of the Apperson.

Center City, Minn.—G. Lorens has closed a contract with the White Bear Auto Co., St. Paul, to handle the R. C. H. cars in the southern half of Chicago county.

Philadelphia, Pa.—J. G. Satterthwaite has been appointed manager of the Whiting Motor Co., of New York, local Mercer distributor, northwest corner of Broad and Green streets.

San Francisco, Cal.—T. J. Beaudet, former Cadillac racing driver, has abandoned racing to take the position of mechanical superintendent of the San Francisco agency of the Cadillac.

Syracuse, N. Y.—Frank P. Anderson, Syracuse agent for Hupmobile cars, has removed to his new quarters at 600 Salina street, taking the garage formerly occupied by the Joseph J. McCarthy Taxicab Co.

Indianapolis, Ind.—The Goodyear Tire and Rubber Co. has employed James T. Kennedy of Indianapolis in its truck tire sales department and has assigned Mr. Kennedy territory including Indiana, Pennsylvania, Kentucky and Tennessee. Mr. Kennedy will make his headquarters at Akron, O.

Detroit, Mich.—A. H. Brown has been made branch manager for the entire northwest territory for the Studebaker Corporation and will hereafter be located at Portland, Ore. He formerly represented the company at Spokane, Wash. C. W. Hartman, branch manager for the Studebaker Corporation at Dallas, Texas, has had his territory extended somewhat. A subsidiary distributing point to this branch has been opened ato San Antonio, of which Hartman is in charge.

Asbury Grove, Mass.—A new garage is being erected near the old depot grounds for John Mason.

Cleveland, O.—The A. W. Hall Automobile Co., 6119 Euclid avenue, has been organized to handle the Hatfield truck here.

Lancaster, N. H.—The owners of the Mansion house, one of the large hotels at Lancaster, are building a big garage to accommodate touring parties visiting that section.

Toledo, O.—The Willys-Overland Automobile Co., of Toledo, Ohio, has filed papers with the secretary of state, increasing its capital stock from $6,000,000 to $15,000,000.

Lansing, Mich.—L. Clyde Smith, assistant to the director of advertising of General Motors Co., Detroit, has been appointed advertising manager of the Olds Motor Works.

Syracuse, N. Y.—The J. I. Case Threshing Machine Co. plans to erect a modern garage and distributing depot within the next 12 months that will make Syracuse the central distributing point for the entire state instead of merely central New York for the Case.

Toledo, O.—Extensive improvements are being planned by C. B. Sage and H. P. Hall, the new managers of the Standard garage at Toledo. A large amount of additional space will be added, and a department will be established to meet the requirements of tourists.

Toledo, O.—The W. H. McIntyre Co. of Toledo has been incorporated by W. H. McIntyre, William Vollmayer, Frank Carabin, Edward Laskey and Frank Kelly. The concern, which is capitalized at $10,000, will take over the business of the United Motor Co., of which McIntyre has been manager for several years. The

Recent Incorporations

Brooklyn, N. Y.—Penn Auto Co., capital stock, $5,000; incorporators, Louis J. Wendell, Harry C. Partridge, Morris Wolf.

Buffalo, N. Y.—Mutual Motor Car Co., capital stock, $125,000; to manufacture motors; incorporators A. Poppenberg, F. C. Carter, O. E. Yeager.

Camden, N. J.—Garrison Gasoline Engine Specialties Co., capital stock, $125,000; to manufacture devices for engines, motor cars, etc.; incorporators, F. A. Kuntz, F. S. Saurman, F. S. Mussey.

Camden, N. J.—Service Motor Truck Co., capital stock, $50,000; general motor car business; incorporators, R. L. Smith, C. D. Hackett, E. J. Eldridge.

Cincinnati, O.—Swing Wheel Co., capital stock, $50,000; to manufacture motor car wheels; incorporators, A. J. Swing, Richard E. Werner, Rupert H. Landale, C. A. Bickett, Richard A. Bickett.

Cincinnati, O.—Victor Auto Parts Co., capital stock, $20,000; to sell motor cars, motorcycles and carriage accessories; incorporators, William J. Corcoran, Edward B. Corcoran, John L. Corcoran, Harvey R. Corcoran, H. R. Kerans.

Cincinnati, O.—Oil Industrial Co., capital stock, $10,000; to deal in oils, greases and belt dressings of all kinds; incorporators, E. G. Holden, John C. Rogers, Earl H. Passel, George C. Schmidt, Jr., E. R. Helsel.

Cleveland, O.—Knox Rubber and Supply Co., capital stock, $10,000; to manufacture and sell rubber goods; incorporators, R. A. Lang, C. S. Wachner, H. H. Burton, A. S. Dale, P. F. Blaine.

Columbia, S. C.—Consolidated Auto Co., capital stock, $5,000; to sell motor cars and supplies; incorporators, J. B. Roddey, John J. Cain, J. P. Matthews.

Detroit, Mich.—Michigan Motor Specialties Co., capital stock, $20,000; to manufacture, motor car devices; stockholders, Nellie M. Beck, Charles W. Beck, Charles Wright, Jr.

Detroit, Mich.—Hercules Motor Truck Selling Co., capital stock, $50,000; stockholders, Angus Smith, James O. Murfin, W. F. Webb.

Hudson, N. Y.—Warren Street Garage Co., capital stock, $6,000; incorporators, John F. Hester, Henry B. Hester, Dennis Hester.

Jamesburg, N. Y.—Ex-Cel Motor Truck Co., capital stock, $250,000; general motor car business; incorporators, T. C. Corwin, A. Englehart, A. K. Kelley.

Nashville, Tenn.—City Taxicab Co., capital stock, $3,500; incorporators, E. D. Dakin, T. O. Perkins, J. D. Andrews, W. V. Andrews, F. M. Swann.

Newark, N. J.—Barlow's Electric Garage Co., capital stock, $20,000; incorporators, W. W. Scofield, D. A. Barlow, William T. Benjamin.

New York—Wadsworth Garage, Inc., capital stock, $9,000; incorporators, William Daly, Albert C. Christian, George A. Boyd.

New York—McGraw Tire and Rubber Co., capital stock, $100,000; to manufacture and deal in tires and rubber goods.

Paterson, N. J.—Paterson and New York Motor Express Co., capital stock, $50,000; general transfer and express business; incorporators, J. M. Simpson, M. Brooks, H. Smith.

Philadelphia, Pa.—L-M-S Motor Co., capital stock, $10,000; to manufacture motors, etc.; incorporators, H. Cohen, Emil Adler, J. J. Baker.

Pittsburgh, Pa.—Pittsburgh Motor Service Corporation, capital stock, $60,000.

Reno, Nev.—Mack Auto Co., capital stock, $50,000; incorporators, M. J. Mack, E. D. Mack.

Seattle, Wash.—Dahl Punctureless Tire Co., capital stock, $60,000.

Trenton, N. J.—M. and M. Tire Co., capital stock, $20,000; incorporators, William McGinnis, Edgar W. Cresse, Walter A. Wood.

Washington, D. C.—Automobile Engineering College, Inc., capital stock, $5,000; instruction to chauffeurs; incorporators, Frank N. Justice, Garfield H. Street, Edgar L. Turner, Thomas W. Smithfield.

Wilmington, Del.—Wallace Automobile Co., capital stock, $300,000; incorporators, Clarence Jacobs, S. E. Roberson.

Wilmington, Del.—Protective Auto League, Inc., capital stock, $1,000,000; incorporators, Isaac Fogg, George D. Hopkins, George W. Dillman.

Wilmington, Del.—Wallace Automobile Co., capital stock, $300,000.

company will retain the location at the corner of Madison avenue and Tenth street.

Boston, Mass.—W. E. Taylor, sales manager of the Lansden Electric Motor Co., of Boston, has leased salesrooms at 242 Columbus avenue.

Boston, Mass.—The Lexington company of New England has leased the building on Northampton street, Boston, formerly occupied by the Premier branch as a service station, the former company using it for the same purpose.

Bridgewater, Mass.—Because additions were being made to the Bassett garage at Bridgewater, Mass., and that the owner was one of the stockholders in the Lenox Automobile Co., of Boston, there was some talk of having the Lenox cars assembled at the Bridgewater plant. Mr. Bassett says this will not be done, as he needs all the room for his general garage business.

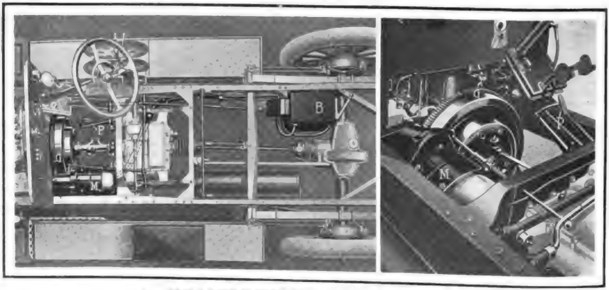
Boston, Mass.—H. M. Groff has been sent to Boston to take charge of the New England branch of the Paige-Detroit car. He will make his headquarters in Boston at the local agency on Hereford street.

Boston, Mass.—A change has been effected in the agency for the American car in Boston. The Essex Automobile Co., that has handled the car for some years, relinquished the agency August 1 to a new firm, comprising Frank L. Roberts and Edward R. Sherbourne, who take it on as a side line. Temporary salesrooms have been opened at 121 Massachusetts avenue, the place just vacated by the Stutz, and a service station has been secured on Bickerstaff street. Later on salesrooms will be secured on Boylston street.

Milford, Mass.—Nelson L. Huff, whose garage was burned with five cars recently, has arranged with the owners of the property to rebuild the structure and he will begin business again. He had no insurance and his loss will be very large.

Vancouver, B. C.—Two large motor garages were almost burned to the ground in the fire which raged for several hours on Main street August 12. The destruction of the cars stored in the garage of the Commercial Motor, Ltd., caused a loss of between $150,000 and $200,000, while the garage of the Tudhope Motors, Ltd., sustained a loss of about $1,500. Neither of these firms has as yet decided whether it will rebuild.

Peerless Using Gray & Davis Electric Self-Starter for 1913



GRAY & DAVIS ELECTRIC STARTER ON 1913 PEERLESS

SIX-CYLINDER cars made by the Peerless Motor Car Co. are hereafter to be equipped with an electric starting device. This starter is the design of Gray & Davis and is declared to be exceptional in its power and simplicity. The starter is installed in connection with the lighting system. It consists of an electric motor M carried on the frame just behind the engine, a 120-ampere hour storage battery B of special construction, and a constant speed dynamo for automatic charging. Pressure on a pedal P in the driver's compartment engages a gear on the motor with a gear ring G around the flywheel and turns the electric current into the motor. The flywheel is rotated rapidly. The device is capable of spinning the motor for ½ hour, it is asserted by the Peerless company. When the engine begins to run on its own power the starter is automatically disconnected.

This electric starter differs from most of the others which employ electricity, in the fact that it has three chief units—dynamo, battery and motor. A more important difference is that the motor is operated by the 6-volt current which has become standard for lighting systems. The voltage required by most other electric starting systems is higher than 6. This requires that transformers be installed between the battery and the motor, and greatly complicates the device. In the Peerless starter the motor is connected to the rest of the system by a simple switch.

The device in tests by Peerless engineers has shown, it is said, sufficient power to get the largest Peerless car under way with high gear engaged and clutch set. It has propelled the Peerless 48-Six ½ mile on the high gear and then there was sufficient power left to make hundreds of ordinary starts with clutch released. It has driven the 48-Six on second speed up a 7 per cent grade ¼ mile long and again there was ample power for many starts. Under such circumstances cold weather hardly can prevent a suitable mixture being raised in the cylinder. But to quicken the process a priming pump is attached to the dash for use when conditions are especially unfavorable to carburetion. The starter operates at high efficiency, it is declared, owing to the fact that exceptionally large cables are used for connections and weight in battery generator and motor have been reduced as far as possible by the special designing.

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MOTOR AGE

VOLUME XXII

CHICAGO, AUGUST 15, 1912

NUMBER 7

HAYNES The Newest Model—Electric Starting and Electric Lighting **HAYNES**

Here's the Car that Has Taken the Country by Storm

WE wish we could tell you all the good things that have been said—by trade and public alike—about the newest Haynes, Model 22.

There is no end to the praise. Everybody seems agreed that Model 22 is just what we said when we announced it last week—America's *first car* in point of perfect, efficient completeness.

This splendid new Haynes — electric starting, electric lighting and wonderfully complete in its appointments—is now on display at Haynes branches and at Haynes dealers' show rooms. Nineteen years of intelligent motor car development has made the Haynes a ready seller for years, but no Haynes model has ever before met such an *instantaneous demand* as Model 22.

See the new Haynes at once, or write for catalog and full information. At the price, $2250, there is no other car that *approaches* it in the perfection of its design, excellence of workmanship, comfort and roominess, and complete equipment. Haynes T-head motor, 4½"x5½", 40 h. p.; wheel base, 120 inches; fine hair upholstery 12 inches deep; tires 36x4½ inches; absolutely 100 per cent efficient electric starting equipment of utmost simplicity; Eisemann dual magneto, Stromberg carburetor, Warner autometer, demountable rims, top, windshield, electric signal horn, electric cowl lamp, standard bumper, etc., etc.

Haynes Automobile Company
501 Union Street Kokomo, Indiana

1715 Broadway, New York
1702 Michigan Ave., Chicago

510-512 N. Capitol Blvd., Indianapolis
Van Ness Avenue, at Turk St., San Francisco

MOTOR AGE

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Contents

DEPARTMENTS

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MOTOR AGE

STARTING OF A 50-MILE EVENT IN GALVESTON BEACH MEET

Fast Cars Race Over Galveston Beach

Annual Meet of Texans Attracts Large Crowds—Sport Is Exciting, Louis Disbrow Being Individual Star—Case, Mason, National and Studebaker Among Winners—Simplex Does Mile in :31.11 Over the Sand

By W. D. Hornaday

GALVESTON, Texas, Aug. 10—Signal success marked the fourth annual meet which came to a close here today. It was conducted, like its predecessors, under the auspices of the Galveston Racing Association and as one of the attractions of the Galveston cotton carnival.

The fame of the Galveston beach course has been well spread abroad during the last 2 or 3 years and as a result of this better knowledge of the perfect condition of this stretch of sand speedway there were attracted here for the meet just closed many veteran devotees of the sport.

Big Causeway an Attraction

One thing that contributed very much to the size of the crowds here this year was the completion of the giant concrete causeway across Galveston bay, connecting the city and island with the mainland, and making it possible for cars to enter the city without being ferried across the 2-mile stretch of water. As a direct result of this important improvement motor car parties from Dallas, Fort Worth, Houston, Waco, San Antonio, Austin and other towns in the state made the trip to Galveston during the week. Hundreds of these privately-owned motor cars crossed the causeway and the pleasure-seekers were able to enjoy to the full limit the 3 days' festivities. The mainland end of the causeway connects with a fine system of highway that leads to the more interior portions of the state.

The Galveston beach course is on the gulf side of the island. It is a straight and ideal course of 2½ miles, and according to the statements of experienced drivers it has no superior in the country. The turns are all that could be desired. The fact that the hard sand beach is subjected to tidal inundation keeps it packed and smooth. The course is so laid out that the cars pass the grandstand twice in making each lap. The grandstand itself is a new structure with a seating capacity of 10,000 people. It was comfortably filled at each day's events, and besides this crowd thousands of spectators viewed the racing from the open space along the course. Each afternoon several hundred motor cars were packed closely along the whole 2½ miles of track and from the different vantage points the occupants were able to view the sport. It would be difficult to imagine more ideal conditions for motor racing. The water of the Gulf of Mexico laps at the side of the course, while as far as the eye can reach over the vast expanse of water may be seen the whitecaps as they race in angry mood hither and thither. Flowing inland constantly is a salt-laden breeze that serves as additional tonic for the seeker for pleasure.

As an evidence of the national popularity of the Galveston beach course among devotees of the sport it is pointed out that there were more entrants to this season's 3 days' events than of that of any other race meet this year. The entrants to the different events and classes numbered seventy-three. While a number of these failed to start they were all here and were deterred from participating in the sport by unlooked for happenings and circumstances.

Officials Work Hard

The program for the 3 days was made up of ten events. Through the efforts of Captain J. W. Munn, chairman of the local racing committee, everything at the track was in trim shape. Fred J. Wagner was official starter, F. E. Edwards, chairman of the technical committee of the A. A. A., besides performing the work of inspecting the mechanism of the different cars and putting his official stamp of approval upon the entries and classes, also had charge of the electrical timing machine, and was one of the hardest worked men on the course. The referee was Mayor Lewis Fisher, of Galveston.

TYPICAL FIELD LINED UP FOR START ON GALVESTON BEACH

The judges were G. W. Baker, of Dallas, G. A. Halff, of San Antonia and J. S. Bonner, of Houston. A. E. McPherson, of Indianapolis, was assistant starter. The chief scorer was C. H. Verschoyle, of Dallas. He was assisted by Mr. Korbel.

The mechanical organization, as it might be called, was perfect. The pits for the drivers and mechanicians were well equipped and conveniently located. Everything was systematized so that no time was lost in making the necessary repairs and readjustments.

While from a speed standpoint the meet was not up to the expectations of some of the spectators as well as the entrants and drivers themselves, the exhibition was on the whole very creditable. The showing made by the different cars came up to the usual performances on beach tracks and established the Galveston course as being equal to others of its kind. The high tide had somewhat marred the smoothness of the course on the first day, but the condition of the sand improved each succeeding day of the races. The turns were sufficiently wide as to enable the cars to make them without material loss of time.

Minor Mishap in Race

What might have been a serious mishap occurred in the second event, yesterday —a 25-mile race—when two National cars had a minor collision on the first turn at the east stake on the first lap. Ralph Plummer was driving car No. 11 which was struck, the injury to the latter being the springing of the fore axle. National No. 12 also suffered a sprung axle. The two cars continued in the running, however, Plummer taking first money.

Another mishap feature of the second day was when Case Bullet No. 5, driven by Joe Nikrent, threw a tire in the first lap of the second 25-mile race. It was not called in and the run was finished on the rim, the car taking second money.

Mercer No. 20, driver, A. Ferguson, was put out of commission temporarily on the second day by fire damage while on the first lap of the second 25-mile race.

Representatives of nearly all the larger motor car manufacturers were here and witnessed the different events. Several of these concerns established headquarters here during the meet and it is stated that many sales were made. The fact that the meet was attended by people from all over the state and that many of the visitors came here for the purpose of satisfying themselves as far as possible as to the merits of the respective cars offered an exceptionally good opportunity for sales. Among the visitors were scores of prosperous farmers. Motor car dealers in Texas are finding that the best field for sales is among the farmers and the horny-handed son of toil was a welcome visitor to the different headquarters during the week.

Disbrow Throws a Tire

No untoward accident occurred during the whole 3 days' meet. The nearest approach to it was when L. Disbrow's Simplex Zip threw a tire in the 200-mile race on the last day and the whirling broken piece inflicted slight injuries to his face. The meet was, on the whole, one of the most delightful in many respects that has been given this season, so far. The big crowd was at all times good humored and showed a keen appreciation of the work of the drivers. From a financial standpoint it is understood the promoters of the meet came out on the right side of the ledger. In practically all of the events the Case team clearly had the best of it and it carried away a big share of the $7,000 of prizes.

First Day's Racing

Galveston, Texas, August 8—The program of the first day was made up of five events. Interest was centered in the last one on the list—a 75-mile race, open to class E nonstock cars of 600 cubic inches displacement and under. Disbrow, driving his Simplex Zip, easily took first money in this event. He started at a clip that quickly placed him in the lead and during the entire 75 miles he retained first position, but was closely pressed at different times by Clark, driving a Mercedes. The exhibition made by the Mercedes was but little short of that of the Simplex, the former coming in a close second and never once losing its position of next to the winning car. Disbrow also took second money in the second race, driving the Case White Streak. These two successes made him clearly the hero of the day in the eyes of the spectators.

The first event of the afternoon was a

STARTER WAGNER TELLING DRIVERS TO GET READY

CARS GOING TO THE TAPE FOR START OF A LONG RACE

15-mile race open to class C non-stock cars of division 3-C. The winner was the Case Bullet, driven by Nikrent. His time was 15:04.52. Disbrow, driving his Case White Streak, was a close second; time 15:05.

A Mason Special, Endicott, driver, won the second race of 15 miles. This was a class C nonstock. Two Flanders Specials came in second and third. The third event was devoted to class C nonstock, division 4-C, distance 20 miles. It was won by a National, with Plummer driver, in 20:05. A Stutz, driven by Stolz, was second.

Cleanup for Studebaker

In each of the first four races there were only three cars starting. The entries in the fourth event were all Studebaker 20's, and they finished with Evans, driver, winner of the 10-mile run; time 11:07.9. This race was open to Class C cars nonstock.

In the 75-mile race eleven cars were entered and only five of the number completed the fifteen laps. As stated above, Disbrow, driving his Simplex Zip, won this event. His time was 1:09:16.72.

The time of the Mercedes was 1:09:42.66. A Mason Special was third. Case White Streak and Mercer finished fourth and fifth, respectively. Summaries:

FIRST DAY

Event No. 1, class C nonstock, division 3-C, 15 miles. Prizes: First, $100; second, $25; third, $10.

Car	Bore	Stroke	Driver	Time
Case Bullet	4⅝	5	Nikrent	15:04.62
Case White Streak	4⅝	5	Disbrow	15:05.00
Mercer	4⅝	5	Ferguson	15:09.70

Event No. 2, class C nonstock, division 2-C, 15 miles. Prizes: First, $100; second, $25; third, $10.

Car	Bore	Stroke	Driver	Time
Mason Special	3 11/16	5	Endicott	15:27.75
Flanders Special	4	4½	Tower	15:57.55
Flanders Special	4	4½	Evans	16:09.89

Event No. 3, class C nonstock, division 4-C, 20 miles. Prizes: First, $150; second, $50; third, $25.

Car	Bore	Stroke	Driver	Time
National	5	5 11/16	Plummer	20:05.00
Stutz	4¼	6½	Stolz	22:01.36
National	5	5 11/16	Melaun	Flagged off

Event No. 4, class C nonstock, division 1-C, 10 miles. Prizes: First, $75; second, $20; third, $10.

Car	Bore	Stroke	Driver	Time
Studebaker 20	3⅝	3⅝	Evans	11:07.09
Studebaker 20	3⅝	3⅝	Tower	11:11.91
Studebaker 20	3⅝	3⅝	Finch	Distanced

Event No. 5, class E nonstock, 75 miles. Prizes: $400, $200, $100 and $50 each to cars finishing first in classes 1-C, 2-C, 3-C, 4-C and 5-C.

Car	Bore	Stroke	Driver	Time
Simplex	5	5¾	Disbrow	1:09:16.72
Mercedes	5	7⅛	Clark	1:09:42.66
Mason Special	3 11/16	5	Endicott	1:12:16.92
Case White Streak	4⅝	5	Ulbrecht	1:58:49.70
Mercer	4⅝	5	Fergus'n	2:00:20.00
National	5	5 11/16	Plummer	
Lozier	5⅜	6	Horan	
Flanders Special	4	4½	Evans	
Flanders Special	4	4½	Tower	
Case Bullet	4⅝	5	Nikrent	
National	5	5 11/16	Melaun	

PUSHING OUT THE BIG JAY-EYE-SEE

So good was the sport today, that it was predicted that there will be huge crowds out for the next two sessions of the meet.

Second Day's Racing

Galveston, Texas, Aug. 9—There was a good program of events for the second day of the meet. The crowd was almost as large as on the opening day, and interest in the different races was not lacking. No accident occurred to mar the different events until the last on the list—that of the flying start for beach record—was reached. It was discovered when the first car went over the wire the 200-horsepower Jay-Eye-See, which was entered and driven by L. Disbrow, that the grounding of the timing wire prevented any time being taken. There were five other entrants to this event and the contest was the subject of much interest on the part of the spectators. Particular disappointment was felt over the cancelled opportunity for the speedy little Simplex Zip which Disbrow also entered and was the driver to show what it could do.

The Zip won its way to popular favor on the first day and it received the plaudits of the grandstand in all of its other notable performances. It easily won first place in the class D free-for-all, covering the distance of 50 miles well ahead of its nearest competitor on every lap. This event was the fourth on the second day's program. The time of Simplex Zip was 46:18.89. The other feature of this race was the unusually large field of entries. Seventeen cars lined up for the start. They filled the entire beach course from side to side, and the get-away was exciting enough for the devotees of the sport.

With the speed which Simplex Zip showed from the beginning it was clear that it was destined to carry off first money, amounting to $350. The second prize of $100 went to the Mercedes. This car showed better speed in the second day's events than in those of the opening day. Third place was won by the Case Bullet, Joe Nikrent, driver. The Case Special, Endicott, driver, came in fourth in this race.

CLARK'S MERCEDES, WHICH WAS A PROMINENT FACTOR

It is worthy of note that in this race Douglas Christie, the driver of Studebaker 20, continued through it notwithstanding the fact he had not been out of his seat during the two previous 25 mile races. It was a trial of endurance that he came through with in good shape.

There were only three starters in the first event of the second day's program. It was for class E non-stock, special cars of 230 cubic inches displacement and under. The first prize of $250 went to the Mason Special in 23:25.76. The Mason was in the lead at the end of every lap of this 15-mile race. The second prize of $100 was won by the Flanders Special, driven by Evans. The fourth car, which was also a Flanders Special, with Tower for driver, dropped out during the fourth lap.

The second event of the day was class E, special for cars of 450 cubic inches and under piston displacement; distance 25 miles. The National, with P. Plummer driver, took first money, its time being 23:54.69. The Case White Streak, with L. Disbrow driver, came in second, and Case Bullet, Joe Nikrent driver, third.

The third race on the program also was for a distance of 25 miles and open to class E non-stock special cars of 300 cubic inches and under piston displacement. The Case Bullet, with Nikrent entrant and driver, won this race in 23:29.9.

In the 75-mile race Fred Wagner disqualified Driver Stolz for cutting across the course with his Stutz. Summaries:

SECOND DAY

Event No. 6, class E non-stock, special, 25 miles. Prizes: $250, $100 and $50.

Car	Bore	Stroke	Driver	Time
Mason Special..	3 11/16	5	Endicott	.23:25.76
Flanders Special.	4	4½	Evans	...24:12.51
Flanders Special.	4	4½	Tower	...24:35.39

Event No. 7, class E, special, 25 miles. Prizes: $250, $100 and $50.

National	5	5 11/16	Plummer	.23:54.69
Case White Streak	4⅝	5	Disbrow	.26:10.37
Case Bullet.....	4⅝	5	Nikrent	..26:46.52
National	5	5 11/16	Melaun	..26:49.03
Studebaker 20..	3⅝	3¾	Christie	....
Case Special....	4⅛	5¼	Perry	....
Mercer	4⅜	5	Ferguson*	....
Stutz	4¼	6½	Stolz*	....

*Failed to finish.

Event No. 8, class E non-stock, special, 25 miles. Prizes, $250, $100, $50.

Case Bullet.....	4⅝	5	Nikrent	.23:20.09
Case White Streak	4⅝	5	Disbrow	.24:43.82
Studebaker 20..	3⅝	3¾	Christie	..33:08.85
Mason Special..	3 11/16	5	Endicott	....

Event No. 9, class D, free-for-all, 50 miles. Prizes: $350, $100 and $50, and prizes of $25 each to cars finishing first in classes 1-C, 2-C, 3-C, 4-C and 5-C.

Simplex Zip....	5	5⅝	Disbrow	.46:18.80
Mercedes	5	7⅛	Clark	...46:43.67
Case Bullet.....	4⅝	5	Nikrent	..51:46.63
Case Special....	4⅛	5¼	B. Endic't	....
National	5	5 11/16	Melaun	....
Studebaker 20..	3⅝	3¾	Christie	....
Case White Streak	4⅝	5	Ulbrecht	....
Simplex	6 1-10	5¾	Pringle*	....
National	5	5 11/16	Plummer*	....
Studebaker	3⅝	3¾	Finch*	....
Flanders Special.	4	4½	Tower*	....
Flanders Special.	4	4½	Evans*	....
Mason Special..	3 11/16	5	H. Endicott*	......
Fiat	5⅛	7⅝	De Palma*	......
Lozier	5⅜	6	Horan*	....
Buick	5	5 11/16	Robeties*	....
Stutz	4¼	6½	Stolz*	....

*Failed to finish

Third Day's Races

Galveston, Texas, Aug. 10—Two scheduled events which were on the program today served to bring out the record-breaking crowd in point of numbers of the meet. Not only was the grandstand filled to its capacity, but the parking space along the entire course was jammed with cars and spectators. The big attendance
was very gratifying t
Munn and his associates,
so hard to make the race
the 200-mile race was
there was no little inte
the proposed effort to
time on the local beac
seconds, made last sea
came last on the day'
was well after darkne
settle down that L. Dis
shoved his big 290-hor
See car onto the cour
trial with a flying start.
the mile in :31.11. It
$200 and had it covere
or less it would have
purse. It was the only
record.

Disbrow Wins Century I

The 200-mile race wa
thrilling incidents. Th
was the little Simplex Zi
This car quickly caugh
maintained it with vary
in the face of a misha
being very serious. T
the throwing of a tire
was about to be crosse
pleting the first 50 miles
around with lightning
strip of it struck and
in the face. It require
utes to replace the tire,
interval the little won
fifth place. It recovere
a few more laps. It p
to the pit—this time fo
—at the end of the lap
of the one-hundredth mi

All during the race t
tor of the Simplex wa
cial, H. Endicott driver
180 miles before visitin
oline or other purpose.
Simplex for the 200 mil
that of the Mason Speci
The third car to finish
the Mercedes, W. H.
and Clark, driver. Its ti

DISBROW IN SIMPLEX ROUNDING THE FLAG

een cars that entered for this four finished. The fourth to the Flanders Special, driven by ıe first prize in this race was ınd, $500; third, $200, and 0. Summaries:

10, class D, free-for-all, 200 miles. st, $1,250; second, $500; third, ı, $100, and prizes of $100 each to ıg in classes 1-C, 2-C, 3-C, 4-C

	Bore	Stroke	Driver	Time
....	5	5⅝	Disbrow	.186 :17.19
al...	3 11/16	5	H. En'c't.	188 :23.31
....	5	7¼	Clark	...195 :47.12
cial.	4	4½	Evans	..216 :47.44
....	5	5 11/16	Plummer†	....
....	4⅛	5½	B. Endicott*	....
20...	3¾	3¾	Christie*	....
cial.	4	4½	Tower*	....
....	4¼	6½	Stolz*	....
		5	Ulbrecht*	....
....	4⅜	7⅝	J. De Palma*	.....
....	5⅝	5 11/16	Perry*	....
....	5	5	Nikrent*	....
....	4⅜	3⅝	Finch*	....
20...	3⅝			

off 37 laps. *Failed to finish

11, class E, non-stock, flying start, cord of 1 mile. Prize of $200 to car making best time, providing of :37.8 is lowered. Special prize car making mile in :30 or better.

	Bore	Stroke	Driver	Time
....	9¼	8⅝	Disbrow	... :31.11

ROAD SESSION ENDS

ıcisco, Cal., Aug. 10—As a fit- to their 3 days' convention in sco, which has been marked by work and many addresses of value, the delegates of the ghway Association motored to just outside of this city, and e peninsula road witnessed the ning of the first shovelful of alifornia's $18,000,000 highway ıe first spade of earth which actual beginning of work on ın, was turned by Burton A. irman of the state highway on the old El Camino Real. ly after the ceremony the Pa- y delegates repaired to three , the guests of San Mateo ı big barbecue. During the e final session of the conven- ld under the spreading oak Ronald, of the highway asso- ized severely the condition mino Real.

FERGUSON'S MERCER SETTING PACE AT GALVESTON

Among the other speakers of the afternoon were President Walker, of the California State Automobile Association, and Thomas Taylor, minister of public works in British Columbia. The final business of the convention was the unanimous adoption of the report of the nominating committee, which left in office practically the same men who are now serving. The new official list is as follows: President, J. T. Roland, of Seattle; honorary secretary, Frank H. Fretwell, of Seattle; vice-president for Alaska, Falcon Joslyn; for British Columbia, A. E. Todd and F. B. McD. Russell; for Canadian Yukon, Alfred D. Thompson; for California, A. G. Briggs of San Francisco and F. W. Jackson of San Diego; for Oregon, Frank B. Bailey, of Portland; for Washington, Samuel Hill, of Maryhill.

WIRE WHEEL DEAL COMPLETED

Philadelphia, Pa., Aug. 13—George W. Houk Co., of this city, which has the American rights for manufacturing the Rudge-Whitworth detachable wire wheels, an English invention, has completed arrangements with the Standard Roller Bearing Co., of this city, for the manufacture of these wheels for the American trade. The Standard company at its plant in this city has sufficient manufacturing space available and already is engaged in equipping it with the necessary machinery for the manufacture of these wheels. It is expected that the manufacturing will begin in 30 days.

MARMON MAKING TRUCKS

Indianapolis, Ind., Aug. 13—Indianapolis is to be the home of another commercial car. The newcomer is the Marmon light delivery truck and will be manufactured by the Nordyke & Marmon Co. The Marmon truck is a light delivery car with a carrying capacity of 1,200-1,500 pounds. The motor used is the same as in the Marmon 32, the four-cylinder pleasure car, with the exception that the truck will use a motor with a 4-inch bore instead of the 4½-inch of the touring car. An unusual mechanical feature is the automatic governor, which limits the speed of the truck to a maximum of 20 miles an hour. A heavy type of rear system will be used, preserving, however, the features of accessibility and simplicity that are found in the pleasure models. Another new idea in connection with light delivery vehicles is brought out in equipping the Marmon truck with dual rear wheels, the double-tired wheels being usually found only on the heavier type of trucks. The new truck uses pneumatic tires, 32 by 4, and has a wheelbase of 120 inches. The company announced the new model today.

ANOTHER CHAIN SUIT

New York, Aug. 12—Suit has been entered and a temporary restraining order issued by Judge Lacombe of the United States district court against Joseph A. Del Solar, of New York, on behalf of the Weed Chain Tire Grip Co., for alleged infringement of the Parsons non-skid patents. The defendant represents the sale of Perry and Peerless chains, made by the Perry Chain Co., of Lansing, Mich. The answer is returnable August 27.

ULBRECHT IN CASE WHITE STREAK AT GALVESTON

Board of Trade Bows to Dyer Pa

Manufacturing Licenses Secured by Trade Organization for Certain Number of Its Present and Future Members—Deal Likely to Bring N. A. A. M. Into Merger

NEW YORK, Aug. 12—As the direct outgrowth of the recent decision sustaining the validity of the Dyer patents, the Automobile Board of Trade has arranged for licenses under these patents for its members. With this comes the announcement that this action of the board of trade will result in an early coalition of the National Association of Automobile Manufacturers with the board of trade. The presumption is that the N. A. A. M. is induced to this step in order to take advantage of the Dyer license rights acquired by the former body.

Manufacturing licenses under the Dyer patents, covering selective gearsets and direct drive epicyclic gearsets, also known as planetary, the right to use the H-change-plate and other devices covered by the patents, have been secured for a certain number of the present and future members of the Automobile Board of Trade, under an agreement dated August 15, 1912. The contract securing these rights is voluminous, but its exact terms have not been made public.

Under the contract the board of trade pays a lump sum to the Enterprize Automobile Co., of Hoboken, N. J., the holding corporation that owns the Dyer patents, and secures the right from the Enterprize company to apply for licenses for its membership without cost up to a certain specified number. It is also provided that in case the individually licensed company leaves the Automobile Board of Trade or abandons manufacturing, the license shall expire. In the contingency of the dissolution of the board of trade, the agreement as such will be nullified. Just what will be done with applications for license in excess of the specified number was not revealed by either party to the transaction.

Deal Made in Patents

As a further consideration for the contract it is provided that the Patents Holding Association, a subsidiary of the old Association of Licensed Automobile Manufacturers and which was inherited by the Automobile Board of Trade, shall convey all rights held by it in the five Dyer patents covering the H-change-plate, removable rigid motor frame, planetary gear and other gear patents, to the Enterprize Automobile Co. and that the licenses issued by that company shall include right to manufacture under all the patents involved and any further motor car patents that may be taken out by Leonard H. Dyer. The rights of the Patents Holding Association consisted of exclusive rights to issue licenses under the five minor patents referred to. These rights have been held by the association for over 6 years. The Enterprise company is left free to grant licenses to other manufacturers on a royalty basis. The rights secured to the members of the Automobile Board of Trade are very broad.

The most important patent included in the license rights attained under the agreement is number 885,986, a division of the application filed by Leonard H. Dyer, February 3, 1900. This patent is remarkably broad in its view and is outlined in fifty-seven separate claims. It is dated April 28, 1908, and consequently will run until April 28, 1925, a trifle less than 13 years. The Enterprise Automobile Co. has issued two manufacturing licenses so far. One was to the makers of the Correja and the other to the manufacturers of the G. J. G. Three importers licenses have been granted and over eighty individual licenses.

Story of the Suit

Suit was commenced against four companies affiliated with the Automobile Board of Trade last year and the minor suits were pressed, according to Mr. Dyer, to demonstrate what basis of royalty should be charged pending the determination of the main suits. This campaign will probably be continued for a time despite the withdrawal of the main suits in question as soon as licenses have been issued to the defendant companies.

According to William A. Redding, patent counsel, associated with Frederick P. Fish in representing the Automobile Board of Trade, the Dyer transmission patent is broader and more intimately related to the motor car trade than the Selden patent was deemed to be. The devices described by Mr. Dyer in patent 885,986 cover the selective type of gearset in fifty-seven phases and Mr. Redding declares that the present type of selective gearset in general use throughout the industry comes within the terms of the patent. The full text of the claims made is reproduced on another page.

The effect of the agreement will be to check prosecutions for infringement against the licensed members of the Automobile Board of Trade and the sellers and users of their product. The four suits now pending against the Maxwell-Briscoe Motor Co., Locomobile Co. of America, Winton Motor Carriage Co. and the Saurer manufacturers will be withdrawn when licenses have been granted to them.

These suits were entered last summer on behalf of the Enterprise Automobile Co. as assignee of the patent rights of Leonard H. Dyer. They called upon the court to grant an injunction against further infringement, and as
counting for profits derive
tringement and damages
infringements.

In discussing the litiga
ding said:

"The patent is imposing
and has been a threatening
industry up to this time.
closed a mass of data, b
can draw its own conclu
tact that my clients we
vised by me, as early as
take out licenses and av
danger and expense that
lowed a complete and fav
tion of the patents in qu

"Since that period, n
ences have been held bet
ested parties, and an optio
the Enterprize Automobile
licenses. This option wou
August 15. I am not at l
the terms of the instrume
ticulars of the agreement
made. There were some
original proposition submi
of the Enterprize comp
changes in the counter-pro
my clients, but I can say
ment is satisfactory to
raises the shadow cast b
of suits against makers a
produced by the Autom
Trade members and gives
rights under the patents a
time the acknowledgment
of the patents by the act o
under them must prove a
patentee and his assigns."

Gist of the Contract

The contract for lice
lump sum agreement pr
present membership of
Board of Trade, if applie
and all companies that j
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ber. As a merger of
Board of Trade and the N
tion of Automobile Manuf
ing, the members of the
ation who are not already
board of trade, will
licenses on that basis.

The procedure by wh
will be granted contempl
tion by the board of tra
prize Automobile Co. for a
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tionably true that future
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bership, including the N.

The present membersh
mobile Board of Trade is

Autocar Co., Buick Mot
Motor Car Co., Cartercar C
for Co., Jas. Cunningham S
more Mfg. Co., H. H. Frankl
ford Co., Haynes Automol

'ive Patents Cover Dyer's Invention

r Car Co., International Motor Co., Jack-Automobile Co., Knox Automobile Co., mobile Co. of America, Lozier Motor Marquette Motor Co., Matheson Auto-e Co., Mercer Automobile Co., Metzger r Car Co., Mitchell-Lewis Motor Co., e Automobile Co., Moon Motor Car Co., nal Motor Vehicle Co., Nordyke and ion Co., Oakland Motor Car Co., Olds Works, Packard Motor Car Co., Peer-Motor Car Co., Pierce-Arrow Motor Car ope Mfg. Co., Premier Motor Mfg. Co., an Motor Car Co., Rapid Motor Vehicle Reliance Motor Truck Co., Reo Motor Co., Selden Motor Vehicle Co., F. B. is Co., Stevens-Duryea Co., S. G. V. R. Thomas Motor Co., United States Co., Warren Motor Car Co., White illys-Overland Co., Winton Motor Car-Co

list totals forty-six. In the event plication for license of the constit-companies of the United States Mo-and the International Motor Co., mber would be increased to fifty-The full roster of the N. A. A. M. s the following cars:

rn, Abbott, Alco, American, Detroit Appereon, Austin, Autocar, Babcock Baker, Glide, Brush, Buick, Cadil-tercar, Chalmers, Cutting, Cole, Co-Firestone-Columbus, Corbin, Stod-yton, De Tamble, Duryea, Elmore, Federal Truck, Flat, Ford, Frank-rford, Grabowsky, Gramm, Great Hayne, Hewitt, Hudson, Hupmo-perial, Interstate, Jackson, Rambler, ruck, Kissel, Knox, Krit, Locomo-der, Stutz, International, Motor Car turing Co., Marquette, Matheson, Everitt, Mitchell, Moline, Moon, Marmon, Oakland, Ohio Electric, le, Packard, Peerless, Pierce-Arrow, ope, Premier, Pullman, R. C. H., tauch and Lang, Regal, Reliance, al Tourist, Selden, Simplex, Sta-rns, Stevens-Duryea, Studebaker, Velie, Walter, Waverley, White, Woods, Overland, Warren. This total of ninety-two members.

M. Membership

are forty-four members of the M. who are not represented in of trade, but among them are s of electrics, a duplication of ebaker Corporation and E-M-F al companies that are active. ited States Motor Co., compris-rush, Maxwell, Columbia, Stod-on and Sampson lines, is ex-take out four licenses for the companies named. This will total number of licenses to be the members of the merged or-to about seventy-five. In the bers are the names of several whose product is deemed to the patents. Precisely which are included in this list will n the licenses are granted.

me of the remarkably success-ions uncovers one of the main the pending merger between ional organizations. The mem-the board of trade is almost uded in the national associa-e national association under s not allowed to hold patent ch. Therefore, if the license assumed by the Automobile de and the two organizations the members of the national ill be able to enjoy the privi-nse rights granted through trade.

Idea Takes in Selective and Direct-Drive Epicyclic or Planetary Gearsets—Claim First Filed June 8, 1898 and Granted in 1900—Inventor Talks of His Device

THE five Dyer patents which have been assigned to the Enterprise Automobile Co. by the Automobile Board of Trade, all apply to improvements in the gearing for motor cars. They are numbered respectively 643,595, 657,650, 662,400, 662,401 and 676,223.

The first of them was applied for June 8, 1898, and was granted September 11, 1900, and covers a fixed guide plate with recesses and notches to hold the gear-shifting lever. This is patent number 657,650. Patent 643,595, granted February 13, 1900, is for two gears and an intermediate epicyclic gearing interposed between one of the gears and the driven axle. Patent 662,400, granted November 27, 1900, covers the subject of two shafts with spur gearing and means for intermeshing the gear wheels so as to transmit power from the driving to the driven shaft.

Patent 662,401 is for a multiple-speed transmission gearing and similar to the main patent save that the gears cannot be shifted as an entirety and the principle of direct drive with all gearing quiescent is not covered. Patent 676,223 covers a removable rigid bridge to carry the motor and operating parts.

Progress of Dyer Patents

In speaking of his patents and particularly referring to patents 885,986 and 921,963, Mr. Dyer said:

"There has been a widely circulated opinion that the Dyer patents were allowed to sleep in the patent office and, after the industry had grown up around them, were issued. This is not true. The exact fact in the case is that through interference proceeding with the Renault patent, application for which was pending co-incidentally with my own, the dates and claims of my patent were revealed and the industry appropriated my idea and incorporated them into the modern car. Imagine, if possible, the elimination of my idea from modern construction; then the importance of my device will be obvious.

"As to the prior art, there is none. Of course there can be found a record of a vast amount of ineffectual endeavor, but there is a difference between ineffectual endeavor and desire to attain a certain result and the actual accomplishment of such a result.

"The American situation is embodied in the Dyer patents, 1900, Renault patent 1901, Law, Leonard and Riker 1903. These records are all available to searchers and if any of them antedated my patents, Mr. Redding surely would have discovered them. In the foreign art there is nothing effective, despite the large quantity of abortive and ineffectual material revealed by a careful search.

"I demanded interference proceeding in the Patent Office when the Renault patent was issued and the whole record of the proceedings is available. The fact that, despite the proceedings, my patent was issued as antedating that of Renault ought to be conclusive. The French Renault patent was issued in 1904."

The Main Dyer Patent

The main Dyer patent in the lime-light at present is number 885,986, issued April 28, 1908, on application filed January 22, 1906, but in reality extending back in its effect to the statutory period before February 3, 1900. The reason for this retroactive effect of the patent is that it is declared to be a division of an application for patent filed at that date by Leonard H. Dyer and which was later issued as patent 921,963 under date of May 18, 1909.

Patent 921,963 underlies the other as a sort of foundation for it. It is for a motor vehicle, covering improvements in the frame, driving gear and changing and reversing mechanisms. According to the language of the patent, the object of the invention is to improve motor car construction by direct driving connections between the motor and the differential with such reduction as is necessary, owing to the relatively different speeds of such parts. In connection with this direct drive mechanism is provided an additional low-speed gearing, and if necessary a back or reverse gearing, either of which will be introduced when required.

The invention also comprises a rectangular metal frame-work, supported by means of springs, upon wheels, with a driving motor carried thereon. Connection is made between the driving engine and the longitudinal shaft by means of the usual friction clutch and the shaft may be provided if necessary with one or more flexible or knuckle joints to permit the framework to oscillate independently of the wheels and yet allow the driving mechanism to run freely.

To provide a speed-changing gear, the longitudinal shaft is formed in two parts with a releasable connection between them combined with means for rotating the two shaft parts at different speeds. The invention is broad enough to permit of any form of mechanism being used for this purpose, but an auxiliary shaft is preferred, so mounted as to be parallel with the two parts of the main shaft, with a

system of spur-gearing, which is normally not in mesh but which can be intermeshed after the two shaft parts have been separated.

Combined with the speed reducing gear is a reversing gear, which may be of any type, but a series of gears mounted upon another auxiliary shaft with bevel gearing so arranged that the two parts of the longitudinal shaft may be caused to rotate in opposite directions is preferred. The claims under this patent number three and are as follows:

1—The combination in a vehicle of a spring-supported frame, driving and steering wheels, a motor mounted upon the front of the frame, a shaft driven by such motor and in line with the shaft of the motor, the said shaft being longitudinally arranged substantially at an equal distance between the wheels and substantially parallel with the ground, a friction clutch connecting the shaft to the motor, a second shaft in line with the first shaft, means for directly connecting the two shafts for driving the second shaft without reduction in speed, means for breaking the connection between the two shafts and for connecting them together through power transmitting mechanism, affording a reduced speed, a differential gear between the second shaft and the wheels of the vehicle, and a reversing gear for reversing the direction of travel of the vehicle.

2—The combination in a vehicle of a spring-supported frame, driving and steering wheels, a motor mounted upon the front of the frame, a shaft driven by such motor and in line with the shaft of such motor, the said shaft being longitudinally arranged between the wheels, a friction clutch connecting the shaft to the motor, a second shaft in line with the first shaft, means for directly connecting the two shafts for driving the second shaft without reduction in speed, and means for breaking the connecting between the two shafts and for connecting them together through power-transmitting mechanism, affording a reduced speed.

3—The combination in a vehicle, of a spring-supported frame, driving and steering wheels, a motor mounted upon the front of the frame, a shaft driven by such motor and in line with the shaft of the motor, the said shaft being longitudinally arranged between the wheels, a friction clutch connecting the shaft with the motor, a second shaft in line with the first shaft, means for directly connecting the two shafts for driving the second shaft without reduction of speed, means for breaking the connection between the two shafts and for connecting them together through power-transmitting mechanism, affording a reduced speed, and a reversing gear for reversing the direction of travel of the vehicle.

The claims of patent No. 885,986 are as follows:

1—In a transmission for motor vehicles, the combination of a driving member, a driven member, a driving gear for the former, a plurality of intermediate gears, including a reversing gear and means, including mechanism shiftable as an entirety, for driving said driven member through any one of said intermediate gears.

2—In a transmission gear for motor cars, the combination of a driving member, a driven member, a driving gear for the former, a plurality of intermediate gears including a reversing gear and means, including mechanism shiftable as an entirety, for coupling said driving member to said driven member and for also driving said driven member through any one of the said intermediate gears.

3—Transmission mechanism for motor vehicles, the same comprising a driving member, a driven member, means to couple said driven member to said driving member to be driven by the latter and means comprising mechanism shiftable as an entirety to drive said driven member at a different speed for said driving member and to drive said driven member in reverse direction from said driving member.

4—Transmission mechanism for motor vehicles, the same comprising a driving member, a driven shaft axially aligned therewith, means to couple said member and shaft, one to the other for direct drive of the latter by the former, a plurality of gears arranged out of line with the axis of said shaft and driven by said member, and a shiftable transmission device on said shaft and adapted to engage the said plurality of gears to drive said shaft in the same, and also in a reverse direction.

5—In a transmission gear for a motor vehicles, the combination of driving member, a driven member, and means comprising mechanism shiftable as an entirety coupling said driving member to said driven member to drive the latter from the former and for varying the speed and direction of movement transmitted from said driving member to said driven member.

6—Transmission mechanism for motor vehicles, the same comprising a driving shaft, a plurality of fixed intermediate gears, including a reversing gear, means for supporting said gears, a driven shaft and means comprising a longitudinal, shiftable transmission device to rotate the latter from the driving shaft to any one of said intermediate gears.

7—Transmission mechanism for motor cars, same comprising a driving shaft, gear supporting means driven therefrom at a reduced speed, a plurality of fixed intermediate gears, including a reversing gear, a driven shaft and means comprising a longitudinal, shiftable transmission device to rotate the latter from the driving shaft through any one of said intermediate gears.

8—Transmission mechanism for motor vehicles, comprising a driving member, a driven member, a shiftable transmission member, means co-ordinate therewith to couple said driven member to said driving member, one or more stationary intermediate gears driven by said driving member and means to bring said transmission member into separate engagement and disengagement with said one or more intermediate gears.

9—Transmission mechanism comprising a driving member and a driven member adapted to be driven one by the other at the same speed, at different speeds, or in a reverse direction and mechanism longitudinally shiftable as an entirety for obtaining such changes in speed and direction.

10—Transmission mechanism for motor vehicle comprising a driving member, a driven intermediate gears, a jack-shaft arranged at transmission device on said shaft, means for coupling said driving member and said driven shaft one to the other for the direct drive of the latter by the former, one or more stationary gears arranged at one side of the axis of said shaft and driven by said driving member and means to shift such transmission device into engagement with the said one or more gears.

11—In a motor vehicle, a motor, clutch, driving gear and driven shaft, all axially aligned, intermediate gears between said driven shaft and driving gear, mechanism shiftable as an entirety to couple said driven shaft to said driving gear and to drive said shaft from said driving gear through any one of said intermediate gears, a jack-shaft arranged at an angle with said driven shaft and driven therefrom and vehicle driving wheels connected with and driven from said jack-shaft.

12—In a motor vehicle, a motor, clutch, driving shaft and driven shaft, all axially aligned, means comprising mechanism shiftable as an entirety for varying the speed and direction of movement transmitted from said driving shaft to said driven shaft, a jack-shaft arranged at an angle with said driven shaft and driven therefrom and vehicle driving wheels connected with and driven from said jack-shaft.

13—In a transmission gear for motor vehicles the combination of a driving member, a driven member, axially aligned therewith and means comprising mechanism shiftable as an entirety to couple said driving and driven members together and to vary the speed and direction of movements transmitted from said driving member to said driven member.

14—In a speed changing gear for motor vehicles, the combination with a motor shaft, a driven shaft, means for connecting the two together to secure high speed, a low speed gearing consisting of a plurality of gear wheels caused to engage by longitudinal shifting movements and means for producing reverse rotation of the driven shaft.

15—In a motor vehicle the combination with the motor and driving wheels, of a gearing connecting the driving wheels and motors, the said gearing comprising a longitudinal shaft and a clutch connecting the shaft to the motor, and by means of which it will be driven, of means for rotating the wheels and a portion of the shaft at a different speed ratio, the said means including a jaw-clutch and longitudinally sliding gears, a single lever for sliding the gears and engaging and disengaging the jaw-clutch and a reverse gearing, and means operated by the said lever for engaging the reverse gearing.

16—In a motor vehicle the combination with a driving motor and driving wheels, of a gearing connecting the two, the said gearing comprising longitudinally aligned driving and driven shafts and a clutch connecting the driving shaft to the motor, and by means of which it will be driven, connections between the driven shaft and the driving wheels, gearing connecting the longitudinal shaft to positively drive the driven shaft at low or high speed, and comprising longitudinally sliding gears and a second clutch, and a single manually operated sliding device for sliding the gears, and for engaging the second clutch.

17—In a motor vehicle, the combination with a driving motor and driving wheels, of a gearing connecting the two, said gearing comprising longitudinally aligned driving and driven shafts and a clutch connecting the driving shaft to the motor and by means of which it will be driven, connections between the driven shaft and the driving wheels, gearing connecting the longitudinal shafts to positively drive the driven shaft at low or high speeds, and comprising longitudinally sliding gears and a second clutch, and a single actuating lever for sliding the
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ed in rigid bearings, carried by the gear gears movable in a fixed plane with re- to said shaft, on the auxiliary shaft means for longitudinally sliding the mov- itch part and its companion gear to dis- the two shaft parts and engage the with a gear on the auxiliary shaft to the two shaft parts to rotate in a differ- ed relation.

In a motor vehicle, the combination with ng shaft made in two parts, of a gear ering on the gear case for the shaft n clutch made in two parts and con- the two shaft parts, one of the clutch lding upon its supporting shaft part, connected to the sliding clutch part ling with it, a gear on the other shaft d rotating with it, an auxiliary shaft, l in rigid bearings, carried by the gear ers on the auxiliary shaft, the said ing rigidly mounted on the shaft and or sliding the moving clutch part and anion gear to disengage the two shaft d engage the gear with a gear on the shaft to cause the two shaft parts in a different speed relation.

In a motor vehicle, the combination with made in two parts of a gear case, on the gear case for the shaft parts, made in two parts and connecting shaft parts, one of the clutch parts pon its supporting shaft part, a gear l to the sliding clutch part and slid- it, a gear upon the other shaft part ting with it, and auxiliary shaft, in rigid bearings carried by the gear s on the auxiliary shaft, and means ithin the gear case for sliding the utch part and its companion gear to the two shaft parts and engage the a gear on the auxiliary shaft to two shaft parts to rotate in a differ- relation.

motor vehicle the combination with shaft made in two parts, of a gear ers on the gear case for the shaft utch made in two parts and con- two shaft parts, one of the clutch g upon its supporting shaft part, nected to the sliding clutch part with it, a gear on the other shaft ecting with it, an auxiliary shaft rigid bearings carried by the gear on the auxiliary shaft, the said rigidly mounted on the shaft, and d within the gear case for sliding clutch part and its companion to e two shaft parts and engage the a gear on the auxiliary shaft to wo shaft parts to rotate in a differ- l relation.

tor vehicle having driving wheels, shaft in line with the motor shaft, ecting the two to cause the shaft the same speed as the motor, the longitudinally arranged between wheels and divided into two sec- n for connecting and disconnect- ections for causing them to rotate g or to permit independent rota- for rotating the rear section of a lesser speed than the motor or direction said means including longitudinally movable in a fixed nnect to said shaft and mechan- ving said gears.

tor vehicle, the combination with of two parts, a connecting gear on each shaft part, of a and gears thereon, and a single ing the gears on the first shaft the clutch.

sion for a motor vehicle, hav- ised of two parts, one telescop- r other, connecting a clutch, a y one clutch member, a second l on the first gear but freely respect thereto, a second shaft, ear and a single lever for shift- ears, and actuating the clutch.

or vehicle, the combination with of two parts, of a clutch con- o parts, a sleeve surrounding ads of the two parts, a gear with the clutch, and engaging a second gear formed integral and engaging with the other ary shaft, gears thereon dis- high speed, intermediate gears en the gears on the second for moving the sleeve clutch engage the two shaft parts- gears wherein the two may be caused to rotate in

gearing for a motor ve- e formed of two parts on the other, a connecting, rotatably formed upon the and 2-as, a sleeve thereon, of freely rotatably with re- gear, a second shaft with a single shifting lever for and disengaging the clutch, coupling, a [illegible] and supporting brackets, and operating rules.

ch, a combination of a ment in two parts, a fixed one part, a rotatable speed gears connected to said

movable member, a plurality of auxiliary shafts, gears thereon, and means for sliding said movable clutch member and connected gears along the shaft to disengage the clutch and intermesh the gears seriatim.

37—In a motor vehicle, the combination with the shaft, formed in two parts of a clutch for connecting parts together because the shaft to rotate as an entirety, slidable gears on the shaft's parts, connecting to and working with one clutch member, auxiliary shafts with gears thereon, and means, which being moved, will first disengage the clutch and move the gears to a position to engage with the gears on one auxiliary shaft to cause the shaft's parts to partake of the different speed relations, and the continuation of the movement will cause the gears to engage with the gears on the other auxiliary shaft and cause the shaft's parts to rotate in opposite directions.

38—In a motor vehicle, the combination with an operating motor, of connections between the motor the driving wheels, comprising a two-piece shaft connected thereto, connections to said shaft and driving wheels, a clutch connecting the two parts of the shaft, a gear carried by one part of the shaft, a second gear carried by the other part, connections between the gears and the clutch for moving altogether, an auxiliary shaft, two gears secured thereto, out of mesh with the other two gears at the high speed, a second auxiliary shaft, two gears secured thereto, normally out of mesh with the first two gears, intermediate gearing interposed between the two gears on the second auxiliary shaft, and means for disengaging the clutch and intermeshing the different gears, whereby the two parts of the shaft may be caused to rotate in different speed relations.

39—In a motor vehicle, the combination with the driving shaft made in two parts, of the clutch connecting the two parts, a sleeve surrounding the abutting ends of the two parts, a gear formed integral with the clutch, a second gear formed integral with the sleeve and engaging with the other part, and an auxiliary shaft, gears thereon, disengaged at the high speed, a second auxiliary shaft gears thereon disengage at the high speed and means for moving the sleeve, gears and clutch to disengage the two shaft parts and intermesh the gears, whereby the two parts of the shaft may be caused to rotate at different speeds.

41—In a motor vehicle, the combination with the driving shaft made in two parts, of a clutch connecting the two parts, a sleeve surrounding the abutting ends of the two parts, a gear formed integral with the clutch and engaging with one part, a second gear formed integral with the sleeve and engaging with the other part, and an auxiliary shaft, gears thereon, disengaged at the high speed, intermediate gearing interposed between the gears, means for moving the sleeve, clutch and gears to disengage the two shaft parts and intermesh the gears.

42—In a motor vehicle, the combination with a motor and driving wheels, of connections between said motor and the driving wheels, including a two-piece shaft, a clutch connecting the two shaft pieces, gears upon the shaft pieces and auxiliary shaft with gears thereon, said gears being so arranged as to be out of mesh when the clutch is engaged, an element longitudinally shiftable as an entirety for actuating said clutch and intermeshing said gears, substantially as set forth.

43—In a motor vehicle, the combination with the shaft formed in two parts, one telescoping [illegible] of a connecting clutch, a [illegible] formed upon one clutch member, a second gear connected to the next gear but freely rotatable with respect thereto, a second shaft and gears thereon and a single lever for shifting said gears and actuating the clutch, substantially as described.

44—In a motor vehicle, the combination with the driving shaft formed in two parts of a [illegible] member on one part, a sliding [illegible] on the other part, a gear rigidly connected to said slidable member, a gear rotatably connected to said slidable member, [illegible] shaft, gears thereon, and means [illegible] the clutch and intermesh the gears.

45—In a motor vehicle, the combination with an operating motor, of connections between the motor and the driving wheels comprising a two-piece shaft connected thereto, [illegible] said shaft and driving wheels, a clutch connecting the two parts of the shaft, a gear carried by one part of the shaft, a second gear carried by the other part, connections between the gears and clutch for moving altogether, an auxiliary shaft, two gears secured thereto, out of mesh with the other two gears at high speed, a second auxiliary shaft, two gears secured thereto out of mesh with the first two gears at the high speed, and means for disengaging the clutch and intermeshing the gears, whereby the two parts of the shaft may be caused to rotate in different speed relations.

46—In a motor vehicle, the combination of the driving wheels, the motor, the driving shaft between the motor and driving wheels, made of two longitudinally aligned sections, a clutch arranged to couple the sections so that the driving shaft may turn as an entirety and longitudinally sliding speed reducing gearing arranged to connect the shaft sections, and so co-ordinated with said clutch that the engagement of said gearing will effect the prior disengagement of said clutch and vice versa.

47—In combination in a change-speed mechanism, a driving shaft, a driven shaft, gears mounted upon said driving shaft and driven shaft, intermediate gears on an axis in fixed relation with the axis of said driving and driven shafts, means for transmitting power from said driving shaft to said driven shaft through said intermediate gears, and means movable on the driven shaft for directly connecting the driving and driven shafts with all intermediate gears at rest.

48—In combination in a change-speed mechanism, a driving and a driven shaft arranged in the same axial line and adapted to have independent movement, change gears carried upon the driving and driven shafts, means for varying the position of said gears, power transmitting means adopted to connect a gear on said driving shaft and on said driven shaft and a clutch mechanism for directly connecting said driving and driven shafts.

49—In combination in a change-speed mechanism, a driving shaft, a gear borne upon said shaft, a counter shaft a gear borne upon the counter shaft and meshing with the gear upon the driving shaft, a driven shaft operatively arranged with relation to the driving shaft and provided with a clutch mechanism adapted to clutch it directly to said shaft, and intermediate gears borne upon the driven shaft and counter shaft, whereby the speed of the former may be varied with relation to the speed of the latter.

50—In combination in a change-speed mechanism, a driving shaft and driven shaft, a driving gear for the former, a plurality of intermediate gears including a reversing gear and means for driving said driven shaft through any one of said intermediate gears.

51—In combination in a change-speed mechanism, a driving shaft, a driven shaft, a plurality of transmission gears mounted to slide thereon, a plurality of intermediate gears arranged to engage and drive respectively, but singly, the said transmission gears, and means to couple said driven shaft directly to said driving shaft.

52—In a motor vehicle, the motor, clutch, driving gear and driven shaft, all axially aligned, means to drive said driven shaft from said driving gear at the same and also at different speeds, a jack-shaft arranged at an angle with said driven shaft and driven therefrom, and vehicle driving wheels connected with and driven from said jack-shaft.

53—In combination in a change-speed mechanism, a driving shaft, a driven shaft, a counter shaft in fixed relation to said driving and driven shafts, and operative gearing on said shafts, and inclosing casing, a bearing in said casing for one end of the driven shaft, the other bearing for said driven shaft being in the driving shaft.

54—In combination in a change-speed mechanism, a driving shaft and a driven shaft, operatively arranged, an inclosing casing, a bearing in said casing for one end of one of said shafts, the other end of said shaft having a bearing in the other shaft, a countershaft in fixed relation to said driving and driven shafts and a plurality of gears connecting said counter driving and driven shafts.

55—In combination in a change-speed mechanism, a driving shaft and a driven shaft, the driven shaft having a bearing in the driving shaft and means movable on the driven shaft to engage the surrounding end of the driving shaft to rotate the two shafts at the same speed, a counter shaft in operative fixed relation to said driving and driven shafts and a plurality of gears connecting said counter, driving and driven shafts.

56—In combination in a change-speed mechanism, a driving shaft and a driven shaft arranged, a counter shaft in fixed relation to said driving and driven shafts, a plurality of gears connecting said counter, driving and driven shafts and inclosing casing, a bearing in said casing for one end of the driven shaft.

57—In a transmission mechanism for motor vehicles, a casing, a driving shaft or shaft [illegible] projecting into said casing at one end, a bearing therein in the wall of said casing, a gear and clutch part fixedly secured thereto and integral with said shaft section and [illegible] on the side of said bearing within said casing, a driven shaft in said casing having a movable complementary clutch part, a counter shaft in fixed relation to said driving and driven shaft, and a plurality of gears on said shaft whereby varying speeds are transmitted to a shaft projecting from said casing.

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Uniform Traffic Rules Are Imperative

THE necessity for uniform traffic regulation laws throughout America becomes more important each year because of the larger number of cars in use in the small and medium-size cities. There are in America approximately 200 cities which may come under this classification. At present scarcely any two of them have the same traffic regulations. In one city slow-moving traffic is not required to travel close to the curb, in another city it is; in one city all vehicles must stop with the right side to the curb, in another they may stop with the left side to the curb; one city makes it imperative to the drivers to look to the rear before turning to the left across traffic or to give a hand signal, in another city such regulations are not enforced; one city requires vehicles at street intersections to keep to the right at the point of intersection when turning right or left, in another city this rule is not recognized. So examples might be cited by the hundreds, showing the entire lack of uniformity in our various cities in spite of the fact that the motor car is an interstate vehicle, it being possible to travel through ten or twenty cities of this size in a day's travel in some of the more thickly populated sections and yet there is not uniformity in controlling them.

WITH the object of testing out the various cities on the question of a uniform traffic ordinance, Motor Age wrote to upwards of 200 cities asking seventeen questions on the subject of traffic control. These covered practically every feature in a rational control system of traffic and were sent to the chiefs of police of cities from 25,000 to 200,000 in population. The replies indicated conclusively that all cities were in favor of slow-moving vehicles keeping to the curb, the percentage of opposition to this being so small as to be negligible. Practically all agreed that vehicles should stop with the right side to the curb. All favored arm signals or others when turning off the street, to give warning to following vehicles. All favored keeping to the right of the centre point of street intersections. In spite of the fact that all favored these regulations they are enforced in cu of the centers, their non-enforcement being lar police and lack of co-operation by traffic-regula

BUT the field of uniform traffic regulations de the matter enumerated herewith, although t completed the list of regulations in which a u given on them throughout the country. In the the ranks were divided, some favoring one and so was expected that every city would be in favor of motor vehicles carrying lights at night, but while in favor of this 25 per cent were opposed to it. reason why police departments should be opposed because it is one of the biggest guarantees fo person using the highway at night. It is a safety as he is the fastest vehicle on the road, but it is to the horse-vehicle driver. Scores of serious acc caused by failure of horse vehicles to carry ligh expected that in the large metropolitan centers ev using a highway between sundown and sunrise sl showing to the front and rear, but frequently t the greatest offenders. If the police departments the regulations on lights at night the motorist to do it as a matter of personal protection.

IT is important that the majority of cities cons of right of way at street intersections. W south, or east or west gets the privilege will d local conditions. Heavy traffic is generally a de in New York city the major traffic is north quently this traffic is given precedence over e street intersections where policemen are not stati impossible to have uniform regulations on this throughout the country, but there is not any rea cannot adjust the matter itself.

Commendable Patent Proceeding

THE lessons learned by continued patent litigation in connection with the recent Selden patent have doubtless had much to do with the arrangements entered into last week by the Automobile Board of Trade and the owners of the Dyer gearset patents covering arrangements whereby all members of the board of trade are given licenses for these patents. By purchasing outright such privileges for its members this organization has freed its members from the possible turmoil that would be the outcome of numerous suits for patent infringements. The attitude of the association is commendable in that it gives to its members that peace from legal unrest, which is so disrupting in business organizations. This method of securing protection under this patent to its many members frees each individual member from the necessity of investigating the validity of the patents and also searching the patent records of foreign countries. It is an excellent example of the economy in dollars and cents to associations of this nature, and members of the Automobile Board of Trade should appreciate the work of the officers of the organization in taking this step in their behalf. If for nothing else than the freedom from worry, the action is a most commendable one.

THIS patent situation, which thrust itself t scarcely 2 years ago although it has been in since 1899, shows the necessity for an improvem laws, where patents are permitted to run 10 or m the patent office without being issued as it ma possible for the different manufacturers to be su particularly where using parts that make it which claims for patents have been made. Thi onstrates the importance of limiting the perio ance, making it imperative that each patent be a certain period in the patent office. Were thi matter of 1 or 2 years it would serve as an en to the manufacturers. It has been argued that period for the issuance of patents it would be i the necessary investigations for prior art, but t be readily handled. Whether such patent refor plished in the near future remains to be seen hoped that the controlling organizations and the will continue to show that good judgment whi played in the present situation.

Boillot Wins the Mont Ventoux Climb

Grand Prix Peugeot Breaks Records in the French Hill Classic

PARIS, Aug. 12—Special cablegram—Boillot in the grand prix Peugeot won the Mont Ventoux hill-climb at Lagarenne today in 17 minutes 46 seconds, smashing Bablot's record for the hill which has stood untouched since 1909. Dedier in a Cottin-Desgouttes was second with a time of 18:38, also breaking Bablot's previous record of 18:41 for the hill. Demorces in the Benz acquired third place. The complete results of the climb are:

Driver	Car	Time.
Boillot	Peugeot	17:46
Deydier	Cottin-Desgouttes	18:38
Demorces	Benz	18:49
Bugatti	Bugatti	19:16
Christians	Excelsior	19:34
Thomas	Lion-Peugeot	21:14
Tongazzi	Fiat	21:51
Grun	Hispano-Suiza	22:50
TOURING CLASS		
Pox	Cottin-Desgouttes	24:35
Juvanon	Schneider	28:11
Thivolle	Cid valveless	34:15
Robert	Cid	34:31
Tonndorf	Apollo	38:27
		42:35

This is the fourth year in which the record for the Mont Ventoux climb has been held by the winning car of the grand prix. Boillot's Peugeot, which won the climb today, is the same car that carried off the honors of the grand prix. The record of Bablot, which was broken today, was made in 1909 in the grand prix Brazier driven by Thery at Dieppe the previous year. Boillot's average speed for the hill was 39.7 miles per hour.

Mont Ventoux stands out as the oldest, the most important and the most difficult hill-climb in France. With a total length of a fraction over 13 miles, its maximum gradient is 13 per cent over the last few hundred yards, and after a short distance at the bottom it rarely drops below 8 per cent.

ILLINOIS STATE FAIR TOURS

Springfield, Ill., August 10—Nine tours are planned by the Illinois State Board of Agriculture for Illinois motorists during the state fair, three prizes being offered in each tour. In addition to the individual prizes, which are to be furnished by the board, a grand country mileage trophy is offered by Colonel A. W. Miller, of Chicago, a member of the board. The Automobile Blue Book Publishing Co., of Chicago, also has offered some prizes, in the shape of four 1912 Blue Books, to be presented respectively to the driver showing the greatest mileage, to the woman driver making the best showing, to the car carrying the most unique and striking state fair banner, and to the car having the toughest luck. Other prize offerings are expected before the consummation of the tour.

The tour is open to any Illinois motorist, no entry fee being required. The state is covered by nine routes, starting respectively from Chicago, Freeport, Mt. Carroll, Rock Island-Moline, Jerseyville, East St. Louis, Cairo, Harrisburg, and Kankakee. Branch tours, joining the main tours, will start from Rockford, Quincy, Pittsfield and Danville, hardly a county in the state but is included in the itinerary of one of the routes. The objective point of all the tours is the St. Nicholas hotel, Springfield.

While the tour is restricted to runs within the state, motor cars owned outside the state but starting from any Illinois city or town having a newspaper will be allowed as contestants. Cars entered from Sangamon county will not be awarded prizes but will be given honorable mention, if worthy. The only requirements are that entries must be registered with J. L. Pickering, Springfield, Ill., and the route to be traversed designated, which route must be adhered to.

Before starting a formal entry blank must be filled and the time of starting and speedometer reading must be observed by a newspaper man or other authorized person. The official start may be made only from a point on a trunk or branch route designated on the map, from which point the time of departure and speedometer reading must be officially observed as above specified.

The tour will start October 4, and all contestants must finish by 11 o'clock October 10. The first prize for each of the nine tours will be awarded to the contestant making the best average time, and consists of a gold medal or charm; the second prizes are of silver, and the third of bronze. The mileage trophy will be awarded to the county whose entries total the greatest mileage, that is the greatest total miles travelled by all contestants from any given county, its disposal to be decided by the vote of the winners.

October 12, motor day, will be one of the biggest days of the fair, and will be featured by races in which Disbrow in the Case Giant will compete, and a five-mile race between a biplane, a monoplane, a motor car, and a motor cycle. The $600 board of agriculture trophy, won in 1910 by the Chicago Motor Club, and in 1911 by the Springfield Automobile Club, will again be contested for.

Coming Motor Events

*August 30-31—Elgin road races; Chicago Automobile Club; Elgin, Ill.
September 2—Track meet at Winnipig, Canada.
September 3-6—Chicago Motor Club's truck demonstration.
*September 9-12—Commercial vehicle run; Chicago Motor Club.
September 11-14—Third annual reliability run of Automobile Club of Buffalo, Buffalo, N. Y.
September 17 — Grand Prix; Milwaukee, Wis.
*September 20—Wisconsin challenge and Pabst Trophy races; Milwaukee, Wis.
*September 21—Vanderbilt road race; Milwaukee, Wis.
September 17-20—Fire engineers' convention; International Association Fire Engineers, Denver, Colo.
September—Track meet; Universal Exposition Co., St. Louis, Mo.
October 4-5—Track meet; Sioux City Auto Club, Sioux City, Ia.
*October 7-11—Chicago Motor Club reliability run, Chicago.
October 12—Track meet; Rockingham park, Salem, N. H.
October 24-26—Santa Trophy Team match, Chicago Motor Club.
November 6—Track meet; Shreveport Automobile Club, Shreveport, La.

*Sanctioned by A. A. A.

SHOWS

September 23-Oct. 3—Rubber show, Grand Central palace, New York.
September 26-Oct. 6—Exposition agricultural motor cars, Bourges, France.
November 8-16—Olympic show; overflow November 22-30 Agricultural Hall.
December 7-22—Paris salon.
January 4-11, 1913—Cleveland show.
January 4-11—Montreal show.
January 11-18—New York pleasure car show; Automobile Board of Trade; Madison Square Garden and Grand Central Palace.
January 11-22—Brussels, Belgium show, Centenary Palace.
January 20-25—New York truck show; Automobile Board of Trade; Grand Central Palace and Madison Square Garden.
January 20-25—Philadelphia show.
January 27-Feb. 1—Detroit show.
February 1-8—Chicago show.
February 10-16—Minneapolis show.
February 17-22—Kansas City show.
March 3-9—Pittsburgh show.
March 8-15—Boston show.
March 17-22—Buffalo show.
March 19-23—Boston truck show.
March 24-29—Indianapolis show.

FLOODS DELAY ALCO TRUCK

Chicago, Aug. 12—The trip of the trans-continental Alco truck is just one flood after another, according to advices received from the crew at Point of the Rocks, Wyo. Just as the motor freighter, which is now engaged in the first delivery of merchandise from one end of the country to the other, was going well after experiencing ten cloudbursts in 8 days, it ran into another heavy rain-storm that hung it up along with four trans-continental touring parties and two prairie schooner outfits.

Reports from the Wyoming country are to the effect that floods are worse at this time than in 14 years and travel by motor through certain sections has been made impossible by the conditions of the road.

From latest information the Alco truck is on its way towards Evanston, Wyo., where it is taking a trail towards Salt Lake City; from there the route will lead to Reno, San Francisco and Petaluma, Cal., where the load of merchandise will be delivered to the Carlson-Currier Soap mill. Announcement is made that after the cargo is delivered, another load will be taken on and hauled overland to Los Angeles, adding 500 miles to the journey.

Milwaukee Now Starts Sale of T

Mail Orders for $20,000 Worth of Seats for Grand Prix and Vanderbilt Road Races Reported—Train Arrangements Being Made—Work on Course Progressing Rapidly

MILWAUKEE, Wis., Aug. 13 — The actual sale of seats and admission tickets for the Vanderbilt cup races at Milwaukee September 17, 20 and 21, began in Milwaukee on Monday, August 12, and the pasteboards were placed on sale in a dozen of the largest cities simultaneously today. Manager Bart J. Ruddle of the Milwaukee Automobile Dealers' Association personally placed the seat sale in Chicago this afternoon. The Chicago Motor Club and Chicago Automobile Club will be in charge. The New York sale will be carried on at 1784 Broadway, in the United States Tire Co. building.

Meanwhile the mail order sale proceeds briskly and now amounts to more than $20,000. While the box sections have been pretty well picked out, there are still some choice boxes left, which is the case with the parking spaces immediately flanking the grand stand and the official paddock opposite, wherein there will be the pits, the official stands, press and telegraph towers and executive offices.

While there will be no club stands, the M. A. D. A. has arranged to reserve approximate sections of the grand stands for the larger motor clubs of the country. The Wolverine A. C. of Detroit will pull off a stunt similar to that at Indianapolis, motoring to Milwaukee in a body and watching the contests from an exclusive section. The two Chicago clubs are planning like affairs. The Milwaukee Automobile Club is inviting all of the clubs affiliated with the A. A. A. to come to Milwaukee and make its clubhouse their home during the week.

Manager Ruddle has been officially advised by W. W. Lifsey, general eastern agent for the New York Central lines, that in addition to the arrangements made by the lines to handle the extra passenger traffic during the race carnival time, a special train de luxe will be run from New York city straight through to Milwaukee, over the Northwestern or the Milwaukee road from Chicago.

The train will really be the special of the Automobile Club of America, which is arranging for the party. It will consist of new steel compartment sleeping cars, buffet smoking cars, dining cars and observations, and will leave the Grand Central in New York about noon on Sunday, September 15, arriving in Chicago at noon September 16 and Milwaukee during the afternoon. The entire train will be parked in some convenient and accessible spot in the Milwaukee or Northwestern yards and will serve as a hotel for those who are unable to obtain or do not desire hotel accommodations in the city during the 5 days' stay. The train will leave Milwaukee on Saturday night, September 21 or early Sunday morning, September 22, arriving in New York approximately 24 hours later. The A. C. A. has secured an agreement whereby the cost of the trip will be $70 per person, two in a room, and $90 per person, one in a room. The rate includes round trip fare, all meals en route and occupancy of the cars during the 5 days in Milwaukee.

Teddy Tetzlaff, who holds the world's road race speed record, brought the entries of two Fiats to Milwaukee in person on Sunday. Teddy was on his way from Los Angeles to Akron, O., before going to Elgin and then Milwaukee. He will pilot a Fiat in the grand prix on September 17 and another in the Vanderbilt on September 21.

The Bosch Magneto Co., of New York, is the first concern to announce the list of special or added awards to be made to the winners in each of the principal events, the Vanderbilt and the grand prix. The winner of the A. C. A. gold cup will receive $500 in gold from the Bosch people; the winner of second place, $200, and third, $100. Two hundred dollars in gold will go to the winner of the Vanderbilt cup; $100 to second high and $50 to the third place pilot.

The International Harvester Co., which has one of the largest of its numerous plants in Milwaukee, has joined the ranks of the big donors to the
fund with a cash donatio
the further gift of the
worth of power apparatus
ing equipment, estimated
$2,500. The company b
high-duty tractors in the
and much of its special r
equipment, including drag
ers and dump wagons.

An inkling of how good
roads selected for the cou
result of years of improve
may be seen from the
new stretch upon which
menced early last week.
work was started it con
and the road seemed an i
mud. The scrapers were
heavy downpour and whe
out for a short time the
road was as dry as a bon
every day since, but bey
surface, the rain has not s
like macadam surface, th
which was laid years agc
was a military highway.

It has been finally dete
course will consist entir
and that no part of it
It was impossible for the
secure a guarantee from t
finish the work by Septem

BUFFALO ANNOUNCES A

Buffalo, N. Y., Aug. 12
nual 800-mile reliability t
mobile Club of Buffalo
September 11, 12, 13 and
sion was reached last even
contest and runs comm
Orsen E. Yeager is chai
this year will be known

FLANDERS ELECTRIC BLAZING GLIDDEN TRAIL NEAR BROWN

Uncle Sam Promising Bumper Crops

bility contest. The tour will be open tock and non-stock cars and while lties will be imposed for late arrival ntrols and for work done on the cars, echnical examination will be made r before the start or at the finish of ontest. The course which the con- its will be required to cover in the s of the tour will be approximately iles in length and will cover a large n of western New York and prob- portion of Pennsylvania.

ERS MAKE LONG RUN

ert Lea, Minn., Aug. 12—The first sociability tour of the Albert Lea obile Club was a great success, gh the roads were not the best. The as from Albert Lea to Waterloo, and return, taking 2 days and cov- a distance of about 250 miles. the weather was threatening the s not marred by very much rain t heavy showers preceding made ds heavy most of the way down, the return the highways were in lition most of the way. The party l of forty-two cars and 175 peo- e being many women and a few

The start was made from this rsday morning, August 8.

SS OF A. A. A. PATHFINDERS

, Miss., Aug. 13.—Special tele- e Flanders electric has reached on its way to New Orleans blaz- rail of the A. A. A. tour. The gh Kentucky, Tennessee and Mis- s been an eventful one, but the ade good progress. The run here s a strenuous one because of and other road difficulties. The mphis, 100 miles, promises to be exciting.

TIONAL ENDURANCE RUN PATHFINDER NEAR OTTEKA, O.

Indications Are That Actual Harvests Will Be Larger Than Indicated by Official Figures, Which Means Business for Motor Car Dealers—Winter Wheat Yield Big

WASHINGTON, D. C., Aug. 12—Bumper crops are assured, according to the August crop report of the United States government, and in all probability the actual harvests will be larger than those indicated by the official figures. The estimates are dated August 1 and in the days that have intervened since then, favorable progress has been made in all lines of agriculture. Perfect crop weather has been experienced and much improvement must have occurred since the first of the month.

The government figures show that the yield of winter wheat has been an average of 15.1 bushels to the acre and while the acreage is smaller than last year by 5,623,000, the average yield is .6 bushel larger per acre, bringing the official estimate of the yield to 390,000,000 bushels. This is 64,000,000 bushels smaller than last year in the departmental estimate. That the estimate for 1911 is too high and that of 1912 too low is generally admitted. The official figures of last year have been revised to conform with the data secured by the census bureau which reduces the acreage to 29,162,000 and the yield to 430,000,000.

A report received from the Kansas bureau of agriculture shows that in that state alone the official figures for this year as to winter wheat acreage are 600,000 acres too low. This would account for a difference of 11,000,000 bushels of wheat in Kansas. Thus, according to close students of the situation, the weight of probability points to a yield of winter wheat not far from 400,000,000 bushels with the chances favoring a larger yield rather than a smaller.

The condition of spring wheat is placed at 90.4, a gain of 1.1 since July 1. Since August 1 the condition has improved materially. Last year the yield of spring wheat was 190,000,000 bushels. The August 1 report indicates a yield of 290,000,000 bushels and the favorable weather during the early part of this month when spring wheat is in the final stage of ripening, makes it certain that the total yield will be larger.

The corn crop is estimated at 2,811,000,000 bushels, a decrease in condition of 1.5 points since July 1. Oklahoma makes the poorest showing in corn this season with a condition of 65, against a 10-year average of 76. Iowa, a huge producer, has a condition estimated at 89, against a 10-year average of 83. Oats crop is in splendid condition all over the country.

Summarized, the grain crops of the country are estimated by the government to be about as follows:

Grain	Acreage	Estimated Yield	Condition
Winter wheat.	25,744,000	390,000,000	...
Spring wheat.	19,201,000	290,000,000	90.4
Corn	108,110,000	2,811,000,000	80.
Oats	37,844,000	1,207,000,000	90.3
Other crops except cotton.	17,900,000	675,000,000	...
Hay, tons....	49,209,000	78,000,000	...

Totals compared with last year:

	1912	1911	
Grain and crops	5,373,000,000	4,616,000,000	...
Hay, tons....	78,000,000	47,000,000	...

The difference in money value is in the neighborhood of $1,200,000,000 in favor of the current season.

EDWARDS CHOOSES FACTORY SITE

New York, Aug. 12—Official announcement has been made that the Edwards Motor Car Co. will be located in the plant formerly used by the United States Metal Products Co., at Long Island City, for at least 1 year. The plant, which is now in progress of being remodeled for the use of the motor car company, has a floor space of about 50,000 square feet, all on one floor. The company has secured a lease for 1 year with an option to renew it on substantially the same terms for another year in case it is desired. It is the intention of the company to erect its permanent plant in New Jersey; but the time for such a move has not been definitely fixed. With regard to the establishment of a big assembling plant for trucks at Louisville, an option has been secured for such an undertaking, but whether it will be exercised depends largely upon the success that attends the financial negotiations.

Oldfield Bill Reported to Con

WASHINGTON, D. C., Aug. 10—Of vital interest to the motor car and accessory industries is the report made to congress this week on the Oldfield patent bill. Broad changes in the patent laws and recommendations for changes in the equipment and organization of the patent office are outlined in the report. The bill has been fought bitterly by manufacturers all over the country.

It seeks to make great changes in existing conditions, one feature being a section prohibiting a manufacturer from bringing suit for infringement of patents against a dealer who sells the manufacturer's goods at a less price than that fixed by the manufacturer as a retail price.

"As to the wealthy corporations," says the report, "it has become obvious that the skillful handling of patent cases places them at an untold advantage against their smaller competitors. For them a well organized patent department is a reliable machine, where money is the lubricant. This machine, in its slow but grinding way, can reduce to pulp any of the smaller competitors. For large corporations, the maintenance of such a machine, with a staff of lawyers and experts, is merely a small side expense. By its aid they can bluff their weaker competitors into quick submission. If this is not successful, they can drag out a patent suit indefinitely until the weak opponent, unable to bear the ever-increasing expenses, collapses and withdraws."

The report continues: "There is widespread dissatisfaction with the operation of our patent laws. The statutes now in force directly affecting patents have remained practically unchanged since the revision of 1870. Meantime changes fundamental in character have occurred in our industrial conditions."

The report holds that manufacturers abuse the present system of patent rights and that there are defects of administering the patent laws, to be found both in the patent office and in the courts. "No complete remedy," says the report, "for existing evils is possible without removing by adequate legislation these two great causes of dissatisfaction."

The "evils" spoken of in the report cover a broad field of activity. The habit of manufacturers fixing a retail price for their goods is one, the custom of manufacturers of patented articles stipulating in what manner they shall be used is another; and the third evil is a phase of the trust problem, whereby owners of patents suppress them with a view to killing competition.

"As a remedy for these evils," says the report, "it was proposed to limit the absolute right now vested in the owners of patents under which they determine to what extent and in what manner the use

Broad Changes in Patent Laws of the Country Are Recommended

of the patent, or patented article, shall be permitted. With this in view, it was proposed to take away specifically the right recognized by the lower federal courts to fix under the patent law prices at which articles shall be sold at retail, and also to take away the right recently confirmed in the mimeograph case to prohibit patented machines from being used otherwise than in connection with unpatented articles furnished by the vendor or licensor. The existing provisions of law under which the patent monopoly in a new invention is granted for a limited period clearly operate beneficially to the people so long as the patent is used for its legitimate purpose."

The bill has a clause limiting a patent right to 19 years exclusive of the time actually consumed in the patent office in considering it, or by the courts in deciding some phase of it. "This provision," says the report, "is aimed at the procrastination that has become proverbial on the part of applicants for patents."

The bill seeks to upset the present practice of considering as an infringement of a patent any sale of any patented article below the price fixed by the manufacturer. For instance, many well known articles of everyday use, particularly in the motor car accessory trade, have the same retail price the world over. This is a matter controlled by the manufacturer and any cut-rate sale is liable to a suit in the United States courts on the ground that it is an infringement. The bill would make it not a matter of suit on the patent, but simply a matter of contract with manufacturer and dealer.

The Oldfield bill will not be considered at this session of congress, but will be pushed at the beginning of the next session in December.

FRENCH EXPORTS AND IMPORTS

Paris, July 26—An increase in exports of more than $4,000,000, and a very slight increase in imports, with the United States still standing firm, are the outstanding features of the French motor returns for the first 6 months of 1912. During the half year motor car imports rose to the sum of $1,337,940, compared with $1,316,940 for the same period of 1911. The greater proportion of the business was done from January to the end of May, the imports falling off during the month of June, and the cars from England, Germany and Belgium showing a marked reduction in number. The total was only obtained by reason of the large amount of business done by America with France.

The French national ind
reason to be satisfied with
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actual increase, compared
6 months of 1911, totals
creased business has been
land, Belgium, Germany
United States, Brazil, Arg
and Algeria. The most im
of the foreign trade is the
with Belgium. From $2,
first half of 1911, the volu
has increased to $4,330,3
current half year. Grea
stands at the head of the
important customer of F
increased trade with that c
very slight, and the total
comes close to that with
following are the official fi
motor exports for the firs
1912.

	Half ye 1912
Great Britain	$ 5,932,
Belgium	4,330,
Germany	1,687,
Argentina	1,515,
Algeria	1,477,
Brazil	987,
Switzerland	540,
United States	543,
Italy	445,
Spain	333,
Russia	178,
Austria	108,
Turkey	85,
Other countries	2,195,
	$20,361,

MILWAUKEE'S NEW MOT

Milwaukee, Wis., Aug.
will have a motor mart c
that of any city of its size
within a year's time, if
Milwaukee and Chicago l
real estate men, already
conspicuous manner, do not
location of the motor ro
Grand avenue, between Th
and the Grand avenue viadu
concrete structure connect
with the western world.

The Packard will be th
the new row. The Packard
of Chicago has purchased a
feet in size at the south
Thirty-fifth street and Gra
in 30 days will have brok
its new Milwaukee branch
cupying a large building at
and Seventh street. Seve
announcements in regard
acreage in the territory ar
mentarily. Deals have b
are being kept quiet for th

The new motor row is in
beyond the city limits of
this point. That annexati
the sales of the property
thing. The former owner
erty fought annexation for
at present there is a str
mately five blocks borderin
city limits which has never

Americans Book Space in Paris Show

while the adjoining territory for miles is part of the city proper.

The motor row will not stop at the new Grand avenue viaduct, however. The county is building a 120-foot boulevard from the west end of the viaduct to the Hawley road, 5,000 feet beyond, which will be snapped up by the promoters of the concentration idea and platted for motor car houses. In fact, options have been taken on more than one half of the frontage along the Grand avenue boulevard west of the viaduct.

At present there is no motor mart or motor row in Milwaukee. Branches, agencies and garages are scattered all over the city. No effort has ever been made to concentrate the industry, although the district around Fourth and Poplar streets once made a bid to becoming motor row. Not more than three houses are to be found in one block at this time.

R. M. LLOYD MAKES A CHANGE

New York, Aug. 12—R. M. Lloyd, who has been vice president of the General Vehicle Co. for several years, resigned recently from that corporation to take a position as assistant to the president of the International Motor Co., manufacturer of the Saurer, Hewitt and Mack trucks.

Formal announcement of the change was not made until after it had taken place and Mr. Lloyd had been installed in his new work. No announcement has been made by President Coleman of the International or President Wagoner of the General Vehicle Co. as to the significance of the move.

ATLAS DEAL HANGS FIRE

Indianapolis, Ind., August 12—Although this was the day fixed for the sale of the Atlas Engine Works plant and property, Fred C. Gardner, receiver for the company, had no report to make to the court. Judge Clarence Weir is out of the city, but it is understood that upon his return the time for making the sale will be extended.

M. L. Thomsen, of Cleveland, who some time ago said a company of eastern capitalists would submit a bid, sent a telegram saying the men with whom he was associated had been unable to agree on the matter of making a bid. Detroit capitalists, who were said to have been headed by Walter E. Flanders, and who were expected to bid, have withdrawn as prospective bidders. It is reported the men who expected to be interested in this deal also have disagreed.

It is reported there are other prospective bidders in sight, but their identity is not being made public at this time. The proposition is a large one to handle, including assuming bonds for $1,050,000 secured by a mortgage; another bond issue of $105,000 and receivership expenses and mercantile accounts aggregating about $80,000.

Every Inch of Room in Salon Has Already Been Taken by the Makers

PARIS, July 26—Nearly 30,000 square yards of exhibition space have been applied for in connection with the next Paris motor show to be held from December 7 to 22. Every available inch of space has been booked and there is a big waiting list of firms hoping to get into the exhibition by the withdrawal of those already given stands. This year's show, the thirteenth of the series, is distinctive by reason of the large number of American firms taking part. The United States motor industry is represented by Cadillac, Buick, Case, Century, Flanders, Ford, Hupmobile, Mitchell, Oakland, Reo, and Overland.

American accessory manufacturers are generally represented by French agents, who show the products on their own stands and under their own name. Among those having distinct stands are Rushmore lamps, Klaxon, Acheson Oildag, Warner speedometers, Vacuum Oil Co. Only one American tire manufacturer will be represented at the show, this being the Goodrich concern, exhibiting through its European house. American machine tool manufacturers will be represented by Potter & Johnson. Among the few electric vehicles will be those of the Anderson Electric Car Co. This list of American concerns exhibiting at Paris is evidence of the important position the United States manufacturers are securing on the European market, for when the last show was held in Paris, 2 years ago, the only American-built car on exhibition was the Ford.

With every available inch of space booked up, the French manufacturers anticipate a bumper show. The increase has been brought about by the larger number of home firms wishing to compete, and by the increased applications from America and England. Up to the present the English manufacturers have not considered it advisable to take part in the Paris salon, especially as the French exhibition followed very closely after the one at Olympia. For the first time this year many of the leading British manufacturers have applied for space, among the more important being Argyll, Austin, Coventry Chain Co., Daimler, Hele-Shaw, Humber, Napier, Rolls-Royce, Star, Sunbeam, Vickers, Wolseley, and a number of accessory and tire manufacturers. Contrary to expectations, the requests for space from motor cycle manufacturers is below the average, but although this gives bigger space for the cars and accessories, numbers will be unable to get into the hall.

The Paris show is now a purely manufacturers' concern, being organized by the three leading trade associations and run under a profit-sharing system. All exhibitors are entitled to share in the profits, although those belonging to the trade associations participate under more favorable conditions than outsiders. Stand positions are to be awarded by the drawing of lots, foreign exhibitors taking part under the same basis as the home firm, provided their own show organizers give equal facilities to French firms. By an agreement between the aeronautical and the motor car manufacturers, the exclusive use of the Grand Palais—undoubtedly the finest hall in the world for this purpose—has been obtained from October to January. The aeroplane makers have the first display, then turn the hall over to the motor car manufacturers for a second exhibition.

DEATH OF MILWAUKEE DEALER

Milwaukee, Wis., Aug. 12.—Milwaukee motoring circles were shocked today, by the news of the death of Charles G. Habhegger, agent for Firestone tires and partner in the firm of Theodore Habhegger, one of the largest concerns in the state engaged in the manufacture and repair of cars, trucks, tires and parts. Mr. Habhegger's body was found lying in an abandoned warehouse and a pistol nearby told the story of his death. Despondency over ill health is believed to have been the reason. He had recently returned from a 3 months' trip through the Pacific coast country. A pathetic circumstance is that Mr. Habhegger committed suicide directly over the spot where he was born 39 years ago. At that time his parents' home occupied the site of the warehouse.

PREST-O-LITE SUES SEARCHLIGHT

Indianapolis, Ind., Aug. 12—Another suit defending its patents has been brought in the federal court in this city by the Prest-O-Lite Co. The new case is directed against the Searchlight Gas Co. of Ohio and is very similar to cases which have been brought against other concerns. An injunction against the infringement of the Prest-O-Lite patents and an accounting are demanded in the suit. It is alleged that the Searchlight company has refilled Prest-O-Lite tanks. These tanks are trademarked and it is alleged that refilling the tanks is an infringement of this trademark. The Searchlight Gas Co. has an office in this city.

FOSDICK JOINS HUPP FORCES

Detroit, Mich., Aug. 12—Harry Fosdick, formerly sales manager of the Stevens-Duryea Co., has been appointed assistant general manager of the Hupp Motor Car Co. His particular work will be the supervising of agencies and sales distribution.

Minnesota Cars Check in at Win

Fourth Annual Reliability Run Invades Dominion—Small Field Contesting, but Turnout Stimulates Motoring Interest in the Northwest—Marmon and Cadillac Perfect

WINNIPEG, Man., Aug. 11—Minnesotans in their fourth annual reliability tour, after 3 days of road experience, have found that northern Minnesota soil and that of Manitoba may be right to raise grain, but that it is not designed for touring after a rain. Gumbo soil tried the power plants ineffectually, but caused all sorts of annoyances, including the necessity for twice cutting the running schedule 2 miles an hour all round.

The start was made Thursday morning from the Automobile Club of Minneapolis, with nine contestant cars and two non-contestants. One of the former, the Staver-Chicago, withdrew at Hallock Saturday afternoon, due to trouble with the steering gear and other slight difficulties, but expects to pick up the trail at the American border tomorrow. The McFarlan and Cutting entered cars but failed to check out. The Packard non-contesting car is at Hallock with a gear stripped and the differential housing wrecked. The Stoddard-Knight pacemaker car, after a series of slight accidents to tires and fenders, cracked its crankcase over a railroad track 3 miles east of Red Lake Falls. The hole was patched and the pacemaker resumed the lead the next day.

For the first day the run was through familiar Minnesota scenery, over fair roads with stretches of excellent highway, generally well posted with road signs and natives not hostile to the motor car, because the motor car is owned generally by the farmers. Tremendous standing and already harvested crops were seen everywhere and prosperous looking people expecting a rich year after the crops are sold. The first night control was Wadena in a new district of the state for most of the tourists, but already awake to the value of the motor car to the country resident, farmer or business man. Up to this time the experiences of the tourists were normal for Minnesota.

The second day's run was through a country which had been drenched with rain and the outlook was such that the chairman cut the running time 2 miles an hour. The wisdom was evident in a short time. Although the cars had put through a heavy rain on the sandy roads the afternoon before mechanical difficulties were comparatively nothing compared with the conditions they encountered to put a motor car out of commission in the soil which began to change to clay and then to the mucilaginous mass called gumbo, which never lets go its grip until dried and then knocked off.

Tons of water went over the heads of the drivers as chuck holes were encountered and the deceiving liquid required watchfulness of the car crews to insure safety. Road work galore was observed, but the highways had not reached the condition of medium perfection found the first day. The run therefore was slow. Tire trouble was the main hazard for the second day, which ended for the night at Thief River Falls. Considering the recent settlement of the intervening country and that a long part of the road was through the White Earth Indian reservation, the tourists were generally well satisfied. The changing scenery as the northern boundary was approached had entertained the passengers and lightened the rigor of the run.

The noon control was made at the home of a halfbreed Indian family where luncheon was served by the descendants of the Ojibways and one of the hostesses recited right on the spot the descriptions of the land and her people in Longfellow's Hiawatha.

On the third day was the grief. The gumbo had dried and left ruts deep and hard, and the mire was so deep at points that it engaged the radius rods on the front of the runabout class cars, and even touched the hubs of the touring machines. It was a day of Samaritanism. Entrant cars stopped to pull out other contestants and the non-contestant cars and official wagons did like service indiscriminately. It was discovered in upper Minnesota that hundreds of miles of highway are being built by the state high above the marsh land level, but either are not ready to use or, where usable, are more fit for wagons and buggies. The result was slow running and a necessity for detouring along the right of way of the Great Northern road. This led to much trouble as at intervals there were mire holes in the soft prairie land, claimed by state ditch ing hindrances but, in fa calculated to worst the l

When the border line Canadian customs offici to allow the foreigners slight cost—a change w character of the scenery s along the lazy Assini through the old Hudson ments. The soil is all work of similar characte method a necessity. Th but nevertheless in most drivers, skilled in takin short, easy strips, got in

It was noticed betwe Falls and Emerson that were met, although the p perous. The farm plants and the crop outlook sp charged to some extent farmers are busy harvesti tour is practically a scou route not yet the main t the twin cities to Winni be taken on the return tr morrow and ending Thurs

Every sizeable town on gasoline and oil depot, fai interesting and courteous mechanics and seasoned m are up on every emergenc for the stranded visiting trip is expected to be a for the medium and low-p and manufacturer.

REPUBLIC SUES G & J

Indianapolis, Ind., Augu public Rubber Co. of Your brought suit in the feder city against the G & J Ti infringement of patents accounting. It is charged company has infringed on improvement of tires, grar Tod J. Mell of Youngstown G & J Tire Co. has its fac in this city, it is incorpor laws of New Jersey.

STANDING IN TWIN CITIES-WINNIPEG RELIABILITY RU

ENTRANTS, CLASS E, GRADE III

No.	Car	Model	Div.	Driver
1	Marmon	32	5	Robn Fawkes
2	Hupmobile	H 1912	2	Warren Munzer, Clarence M
3	Studebaker 20	8 1912	1	William Soules
5	Cadillac	30 1910	3	A. Zekman
7	Mitchell	5-6 1912	4	George Murphy
8	Paige-Detroit	Brunswick 1912	2	Ed Fox
9	Warren-Detroit	30 K 1912	2	Henry Rockelman
10	Staver	Greyhound 1913	5	Noah Moss, I. B. Haviland
11	Reo V	1912	2	N. Bass
	NON-CONTESTANT, GRADE IV			
12	Buick	21 1911	2	H. G. Blanchard
13	Packard	30 1909	7	Charles Smith

Pilot, Paige-Detroit; J. H. Price, pilot; driver, Mat Nides. Pacemake Knight; driver, H. K. Harrison. Press car, Pierce Arrow 66; driver, O. A. I

*Withdrawn end third day

Elgin Prospects Continue to Improve

Teddy Tetzlaff Enters Fiat for Both Races the Second Day —Clark's Mercedes Also Will Be a Contestant—Mason First Nominated in Small-Car Event—More in Sight

CHICAGO, Aug. 12—Prospects for a brilliant renewal of the annual Elgin road races as promoted by the Chicago Automobile Club and the Elgin Automobile Road Race Association are bright indeed. The entry list continues to grow daily and it looks now as if the field would be made up of a fast lot of cars, including several of foreign make.

Within the past week the entry list has been added to considerably. Teddy Tetzlaff, holder of the world's road record, reached Chicago Saturday and signed blanks which book him for competition in both the Elgin trophy and the free-for-all on the second day of the meet. He is to drive the smaller Fiat which he handled at Indianapolis. In addition Tetzlaff states E. E. Hewlett, his backer, will send on the grand prix Fiat for the free-for-all, which will be driven by Dave Lewis, another California star.

A Mercedes also has been dropped into the speed battle, the entry of George Clark having been secured at Galveston by representatives of the Chicago Automobile Club. Clark intends following Tetzlaff's example and will run in both races on the second day. This makes the roster of stars read as follows: Bruce-Brown, Mulford, Tetzlaff, Bergdoll, Hughes, Zengel, and Merz. No news has been received from France relative to the offers of E. C. Patterson and R. J. Collier to import two of the Peugeots, but it is believed an answer will be had in a day or so.

One entry has been booked for the race for cars 230 inches and under, which was added to the card last week, the nomination coming from F. S. Duesenberg, who has declared the little Mason which did so well in the last Algonquin hill-climb. Harry Endicott is to drive the car. It is likely also that the Mason will go in one of the races Saturday. The Studebaker entry and that of the Herreshoff are expected this week, which will make this race certain.

Heavy rains the past few days have delayed the work on the course, but it is expected that within a day or so half a dozen gangs of men will get busy making the repairs which are needed. The military has been secured and now there seems to be no stumbling block in the way of the promoters.

BURMAN AT CLEVELAND

Cleveland, Aug. 10—The clipping of 4 seconds from the 1-mile dirt track record for Cleveland made 3 years ago by Barney Oldfield on the Old Glenville track was the sum total of achievement at the all star meet promoted by the Burman-Moross combination last Wednesday, as a feature of the Eagles' convention.

Burman, driving the 110-horsepower Benz, made the mile in :49⅘. Oldfield's best time here was :53. A second attempt by Burman to lower records was made in the new 300-horsepower Benz, which was given its first track try-out here. As a speed trial, the exhibition was a failure. After several good starts, Moross, who assumed the joint role of manager and referee, announced for Burman that carbureter troubles had developed, with would prevent a proper trial. A heavy down-pour of rain added the last touch of disappointment to the monster crowd, the largest ever seen at the Randall track. Summaries:

Five miles, non-stock—Burman, Cutting, won, time 5:06; Kyle, White, second; Brown, Stoddard-Dayton, third.

Class E, non-stock—Kyle, White, won, time 4:39⅘; Stoddard-Dayton, second; Flanders, third; Cutting threw a tire and race went to the White.

Three miles, non-stock—Burman, 999 Ohio, won, time 2:48⅘; Kyle, White, second; Hickman, Mercedes, third.

Three miles, class D, non-stock—Burman, 999 Ohio, won, time 2:47⅘; Kyle, White, second; Mercedes, third.

A race meet of the old-fashioned kind, in which the events are confined, with few exceptions, to stock cars, is planned for September by the Cleveland Automobile Club. With the exception of a single exhibition event, in which it is planned to feature Oldfield, who is an old favorite here, and a race for a cup to be donated by the club, and confined to Cleveland race drivers, the events will be real races between cars of standard construction either made or represented in Cleveland. The date for holding the race is fixed tentatively as September 15. The Randall track will be obtained if possible.

RAIN STOPS TEAM MATCH

Chicago, Aug. 12—Torrents of rain, coupled with reports of wretched road conditions, caused the abandonment of the second annual team match between the amateurs and tradesmen of the Chicago Motor Club after half of it had been run. Nine amateurs and ten tradesmen started in the match which left Chicago last Thursday morning for St. Joseph, Mich. The run over, 118 miles, was made easily, the weather being good, but the roads in Michigan sandy. At the end of the first half of the match the amateurs only had 3 points against their team, while the tradesmen were loaded down with 170, the bulk of them coming because one of the cars came in after the 2-hour limit, the delay being caused by tire trouble. Then it started to rain and it kept it up all that afternoon, all night and it was raining in the morning. Reports about the condition of the roads were so terrifying that the majority of the contestants decided that inasmuch as the match only was a friendly one, there was no use undergoing the hardships of a mud plug and possibly meeting with accidents. So the entire match was called off. Some of the hardy ones drove home and found to their surprise that the roads weren't so bad after all and that it would have been possible to have completed the run. Others shipped their cars home by steamer.

GEORGIANS IN MUD PLUG

Atlanta, Ga., Aug. 7—The idea, novel in the south at least, of a 1-day tour within the confines of a single county was given a workout here today when the 1-day route around Fulton county, Ga., was dedicated.

Of the thirty-two cars entered twenty-five started and sixteen finished. That no more finished is due to the fact that in the 125-mile route there were virtually 10 miles, in various short stretches, of red clay road. And this red clay road was transformed by a smart shower in the morning into 10 miles of bottomless mud. There wasn't much of it but it was a plenty. If there had been a lot more nobody would have finished at all. Even under these trying conditions few cars were put out by mechanical troubles. Two of the nine which did not finish dropped out on acount of the rain. Two were knocked out by tire trouble. One ran out of gasoline and had to send to Atlanta for a supply. Two had engine trouble. The rest did not report.

Three prizes were offered, two for the cars which completed the circuit in the time that most nearly approached the sealed schedule fixed by Mayor Courtland S. Winn; one for the car with the best tire score. The time set by Mayor Winn was 7:50:31 for the 125 miles. Owing to the fact that the course was slowed down materially by the rain, nobody made the circuit at that speed and even though 30 minutes were added to the running time, owing to a delay at the noon control, the winning car ran more than 15 minutes behind the time set in the sealed schedule. The winner was a Velie, entered by the Velie Motor Co., of Atlanta. This car went through the last Glidden tour, the last tour-around Georgia and was used for scouting out the 1-day tour. This car made the circuit in 8:37:48. Next to it was an E-M-F, entered by Woods White. Its time was 8:40:51. Twelve cars were tied with perfect tire scores, and when the matter was left to lot the winner turned up in Councilman Knight's E-M-F.

French Army Tries Out Motor T

Annual Test, Just Completed, Most Successful, No Failures Being Recorded in F —Sixteen Firms Represented by Sixty Vehicles—Nation Decides It Is C to Subsidize Privately-Owned Machines Rather Than Maintain a Flee

PARIS, Aug. 2—Military France prefers to subsidize privately owned motor trucks rather than maintain a large fleet of vehicles which never can be fully employed except during general manoeuvres or on the outbreak of war. By offering $600 at the time of purchase and $200 for each of 3 following years it is possible to have at the disposition of the army whenever needed a very large and perfectly maintained fleet of motor trucks. But before the private owner can enter into the subsidy agreement with the government, the manufacturer must have the type of vehicle approved after strenuous tests on the road and close examination at the hands of technical experts.

Trials Now Annual Event

As new models are brought out every year, these army trials are now an annual event, and as it is to the advantage of every manufacturer to be able to offer his trucks to the public with the possibility of a subsidy, all the latest types of commercial vehicles are found in the trials. Probably without the public being aware of it, the army has a greater influence in determining design and development of commercial motors than has the private user. Yet the army makes very few direct purchases. It has the first call, however, by reason of the new models being presented to it for test and examination with a view to participation in the subsidy scheme. The army requirements have tended to standardize wheels and tires, bodies and body fittings; under clearance and track; they have made radiator protectors an essential, they have insisted on hooks front and rear for hauling purposes; they have cut down gasoline consumption and arrested oil wastage; and they have done more than the demands of the private user to develop accessibility.

This year's tests have just been brought to a close. They consisted of 1 month under observation, during which the competing vehicles had to make twenty distinct daily runs over routes radiating from Versailles, the total distance covered being 1,558 miles for ordinary trucks, and 1,225 miles when a trailer was hauled. The runs had to be made under full load, both singly and in convoy formation, without load, and with gasoline, benzol and alcohol as fuels, the army authorities evidently anticipating a shortage of the usual gasoline supply in time of war. An officer was carried as observer on every vehicle, and very careful control was kept of fuel and oil consumption, for it was on running economy, reliability and absence of wear that awards will be made which will entitle the models to be classed as subsidized types. This year there were no failures on the road; but mere ability to cover the distance is not sufficient, and when the road portion of the trials was over a very close examination was made of the working parts. This was not a superficial look-over, but consisted of dismounting rear axles, jackshafts, gearboxes, road wheels, motors, steering gear, etc., at the will of the committee, not a single vehicle escaping without some important part being laid bare for inspection.

The French trucks taking part in the army trials really are representative of the national industry. This year, for instance, sixteen of the leading home firms entered their latest models, the total number of competing vehicles being sixty-two, representing thirty-two distinct models. Although the army stipulates the body sizes and insists on a certain ratio of dead weight to useful load, there is no decided preference for either the motor under the bonnet or the motor under the seat type. This year the bonneted type was in a slight majority, but while certain firms, Saurer at the head of them, claim that the motor should be in front of everything, such leaders as Renault, Berliet, de Dion-Bouton, Delahaye, and Bayard-Clement, build both types.

Small Size of Power Plants

From an American standpoint an important feature of the French trucks is the small size of the power plant. In every case four-cylinder motors were employed, but in only a few cases did the cylinder diameter exceed 4 inches. A very common dimension for 3 to 3½-ton trucks was a cylinder bore of 3 to 3½ inches. There is a tendency, too, to make one type of motor do duty in different chassis designed to carry loads varying from 2 to 3½ tons.

The explanation of the small motor can of course be found in the high cost of gasoline in France. Last year, in calculating running costs, the price of gasoline was taken at 33.3 cents per gallon. This year it is still higher. In motor design there is not any great departure from touring car practice, and except that a lower number of revolutions is aimed at the touring and the track models hardly differ. For the most part the motors are of the L-type, with fixed point high-tension ignition and either pressure-fed or circulating oil systems.

The unit system is not favored, being found on only two types: the Latil, which drive to the front wheels, and the new La Buire truck. The former is distinctive by reason of a considerabl castings in place of alum metal being used only f timing gear housings, o cover, etc. The Latil mo ample of the simplicity th at by the French manufac casting, with valves on take, exhaust and water duced in the casting, and for the magneto was pr crankchamber, there was side of the cylinder castin was screwed a bolt with on the top of the magn down to its platform.

Specialists Furnish Carbu

In the majority of cas turers apply to the spe Claudel, Zenith, G. & A., carbureters. The regulatio gasoline, benzol and alcoh without a change of ca tically no change is requir in the place of gasoline, vaporize alcohol a conside heat is required. For thi all the carbureters are jacketed, with provision f flow of water only when ning on alcohol. The res not the best, but as alcol mercial use in France fo bustion motors, the comp factory. The rigorous co ing oil and grease in the to considerable care bei secure economy. Pressure bearings and connecting pump-driven circulating s equal in numbers. But ance with the actual lub is the necessity of prev through the tappet gu breathers, the ends of th the joints of the gearbox

Among the new mech shown on the trucks was frame member employed Bayard chain-driven mode where the jackshaft pass frame member, this latte ably increased in depth, th frame being straight, bu being given a consider sweep. Thus the total dep member at this point times that at any other p this gave increased streng of the frame receiving the jackshaft bearings and the the rear spring. The fra the truss rod passing aro

ward sweep of the frame of the chassis.

On these models the gearbox was mounted immediately behind the cone clutch, and a propeller shaft carried the drive to the jackshaft. The differential housing was practically of the same type as used on the firm's touring cars, and was bolted to a couple of transverse frame members, one in front of it and one to the rear of it. Unlike some of the smaller models, where the jackshaft was practically of the same design as a touring car rear axle, there was no casing for the two portions of the transverse shaft. Each shaft carried near its outer extremity a brake drum lodged within the face of the frame member, the increased depth at this point making this possible. On some of the other models, notably Delahaye and Peugeot, brakes were fitted at this point, but in both cases the drum was on the outside of the frame, or between the sprocket and the frame. On the Clement-Bayards, with a view to giving accessibility to the brakes, there was a coupling on each half of the jackshaft. All the Clement-Bayards were fitted with pressed steel road wheels, this being a type of wheel which up to the present has not been considerably adopted in France. During the trials it gave very satisfactory service.

La Buire Tries New Truck

La Buire had in the trials a new 2½-ton model, shaft-driven, with canted rear wheels. Unit construction was adopted for the motor and gearbox, the crank-chamber having a rearward extension which encircled the disk clutch and had bolted to it the four-speed gearbox. On an extension of the propeller shaft, to the rear of the axle, the foot-operated brake was mounted, the hand brakes being in the usual position on the road wheels. A double reduction was employed in the rear axle; this consisted of two spur pinions, one of which was mounted on the same shaft as the crown bevel wheel, and the other on the differential shaft.

In principle, though not in the same detail, this has been adopted by several other French firms for both touring and commercial models. These trucks were also fitted with oscillating hubs for the steering wheels. This invention, while giving perfect lateral stability, allowed the wheel to articulate in a vertical plane. It consisted of a central hub with the wheel revolving on a centrally located pin attached in the usual position, but being mounted on the stub axle below the main journal. The result is that the weight of the vehicle is carried by the wheel below the main journal, leaving the wheel free to articulate in a vertical plane about this lower suspension.

Oscillating Hubs Used

Briefly, the construction of the wheel consists of a steel hub pierced in its center for the passage of an axle pin. The spokes are mounted on this hub in the usual way, and in the interior of the hub is a single steel plate bored to provide two distinct bearings; the upper one is the axis of rotation; the lower one receives the stub axle and is the axis of oscillation. The wheel, which is the invention of M. Genillon, appeared to give satisfactory service in the trials. The usual type of muffler was not fitted on the La Buire cars. In its place there was a long, big diameter pipe—probably 3 inches in diameter—attached just below and slightly within the frame number, and terminating in a small diameter pipe discharging at the rear.

Saurer competed with a shaft-driven model, the vehicle being a new 2-ton truck, but all the larger types were retained with side chains. Shaft-drive was in a decided minority, the firms adopting it being Schneider, who builds most of the Paris omnibuses; de Dion-Bouton; La Buire, Berliet for one model only, and Renault. This latter firm has a distinctive construction with one-piece forged rear axle having a central cradle into which the differential housing is received. The method of driving is distinctive. At the end of the propeller shaft a bevel pinion meshes with a crown bevel wheel carrying on its shaft a spur pinion engaging with a larger spur pinion on the end of the left-hand axle shaft. On the continuation of the propeller shaft, to the rear of the differential, there is a second bevel pinion meshing with another crown bevel wheel, also carrying on its shaft a spur pinion in engagement with a larger pinion mounted on the extremity of the right-hand axle shaft. Obviously, the two extremities of the forged axle are bored out to receive the drive shafts. Instead of the usual type of spring shackle, Renault made use of a sliding block, consisting of a hanger bolted to the lower side of the frame member and having two grooved into which the sliding piece mounted on the shackle bolt was received.

Serious attempts have been made by French manufacturers to abolish the use of rubber for commercial vehicles, and in the army competition the use of steel rims gives a decided advantage, for the cost of the wear and tear of tires is estimated by the jury, and this cost must always be lower for steel than for rubber bandages. Steel-shod wheels, however, were present in smaller numbers than usual, and no vehicle came successfully through the trials with steel rims on all four wheels. In a number of cases the front wheels were shod with rubber and the rear ones fitted with steel bandages, Delahaye, Berliet and Latil adopting this combination. This latter firm having the entire power plant over the front axle, there being no mechanism to the rear of the driver's seat, was fully justified in employing steel-shod wheels at the rear. But in other cases the results were not satisfactory.

Temptation to Speed

When running without load the temptation was to speed, with the result that the vehicles danced about on the road, play set up in the spokes of the wheels and the mechanism suffered. Wheels are still the weakest point of the trucks, many having had to be patched up on the road in order to complete the test. In a few cases tires gave way, breaking up completely and having to be changed. Spare rubber bandages had to be carried, their weight being considered as useful load, whereas all other spares were weighed in with the empty vehicle, but as in most cases it was not possible to fit them without the use of a hydraulic press it was difficult to see their untility aboard. Torrihon had a system by which it was claimed that bandages could be changed on the road, consisting of a detachable rim with studs on its inner face passing into grooves on the fixed rim. The same firm had also a quick detachable arrangement consisting of a U-section fixed rim on which the ordinary rubber bandage was mounted and secured in position by means of four circular section rings—two on each side—levered into position in much the same way as a pneumatic tire is levered over its rim.

OFFICIAL OPERATING COSTS OF FRENCH TRUCKS HAVING QUALIFIED IN 1911 ARMY TRIALS UNDER THE SUBSIDY SCHEME

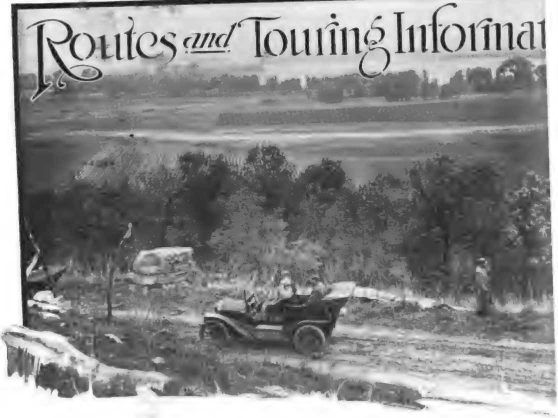
The cost of operating was based on fuel at the following prices:

Lubricating oil	58½	cents per gallon
Grease	8½	cents per pound
Gasoline	33 3/10	cents per gallon
Benzol	22½	cents per gallon
Alcohol	36	cents per gallon

	Distance in miles	Weight empty pounds	Total weight pounds	Useful load pounds	Cost per mile car in cents	Cost per ton mile in cents
De Dion Bouton truck	1,569	6,856	14,528	7,672	3.15	.0090
Malicet & Blin truck	1,569	6,767	11,971	5,204	4.36	.0187
Aries truck	1,569	7,341	15,057	7,716	4.80	.0137
Renault truck	1,569	6,900	13,227	6,326	3.85	.0134
Dietrich truck	1,569	7,363	13,778	6,415	4.52	.0155
Delahaye truck	1,569	5,645	10,934	5,268	0.23	.0096
Delangere-Clayette truck	1,569	6,778	12,543	5,784	4.17	.0159
Berliet truck	1,569	5,676	10,163	4,596	0.24	.0115
Vermorel truck	1,569	6,800	12,984	6,183	4.17	.0140
Front-drive Latil truck	1,569	7,259	14,440	7,179	3.77	.0115
Peugeot truck	1,569	6,194	11,353	5,158	0.23	.0096
Clement-Bayard truck	1,569	5,798	11,397	5,559	0.28	.0109
Saurer tractor	1,255	8,598	15,211	6,613 15,432	6.42	.0062
Aries tractor	1,255	12,147	17,526	5,379 15,432	12.42	.0127

About three quarters of distance was covered under full load, and one-quarter empty. No account is taken of tire wear.

Routes and Touring Informat



SCENE NEAR MANHATTAN, KAS., KANSAS RIVER IN THE DISTANCE

LONG TRIP PLANNED

ST. LOUIS, Mo.—Editor Motor Age—I have just bought a motor car and wish to make a trip from St. Louis to southern California and thence up through southern California, Oregon and Washington; thence back east again along the states bordering on Canada.—J. C. Dalrymple.

You have outlined an ambitious trip, but it will take you to so much that is splendid and through so great a variety of scene and circumstance that even any surprises in becoming acquainted with a new car, it would seem, might become insignificant incidents. As the most southern route probably would not be as pleasant at this season of the year as at some others, it is suggested that you begin your journey by running along beside the Father of Waters through St. Charles, Wentzville, Troy and Louisiana to Hannibal. Crossing the river into Quincy you will proceed into Illinois until opposite Fort Madison when you will re-cross the Mississippi into Iowa. A branch of the Blue Grass road with its blue and white markings will be your guide through Houghton and Stockport, reaching the main line of this thoroughfare a few miles east of Fairfield. You will follow the blue and white striped poles entirely across the state of Iowa, touching enroute the following towns: Ottumwa, Albia, Russell, Osceola, Murray, Afton, Creston, Corning, Villisca, Red Oak, Hastings, Glenwood and Council Bluffs.

Crossing into Omaha you will no longer look for the blue and white stripes, but in their stead will be found bands of yellow and black indicating the Platte valley route. As its name indicates, it lies along
the Platte river and fo
overland route of the
prairie schooners. It has
of interest historically.
towns reached in Nebra
Fremont, Schuyler, Colun
tral City, Grand Island,
ney, Elm Creek, Lexin
land, Gothenburg, Maxw
Paxton, Ogalalla and B

Swinging down into
is made in this state,
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ing to Wyoming. The
state is Pine Bluffs, tl
Burns and Cheyenne.
yon P. O., Tie Siding a
tion to Laramie; thence
Springs, Medicine Bo
Steel, Rawlings, Wams
Station, Bitter Creek,
Springs, Green River
Granger, Liman, Ft. Bri
Spring Valley and Eva
ing the state line into
be through Castle Rock,
Station, to Salt Lake
a visit to this city i
itinerary. However, a
miles from Evanston,
of running through
Weber directly to Ogd
from Ogden, at Brigha

ON MONSERRAT RANCH, CALIFORNIA

IN PT. DEFIANCE PARK, TACOMA, WASH.

provide a generous supply of gasoline, as, after passing this point, it may be difficult to procure. Corrinne, Tremonton, Snowville, Curlew, Kelton, Lucin and Montello are remaining wayside points in Utah.

In Nevada you will touch enroute Tecoma, Cobre, Wells, Elko: 33 miles beyond Elko passing Hylton & Hanna stores, and farther on Sadler's Ranch before you reach Eureka. Thence through Austin, West Gate, Sand Springs, Fallon, Leetville, Hazen Station, Wadsworth and Sparks to Reno. You will fairly sense when you have crossed the state line of California, for the barrenness of the desert, with a certain wierd beauty, is left behind and the land of growing things is reached. You will go up through Truckee, past Donner and Van Norden lakes to Emigrant Gap, and, having topped the Sierras, you will come down through Alta, Colfax, past Lake Arthur to Auburn, Folsom and Sacramento. A most delightful optional route from Reno to Sacramento is through Steamboat Springs, Carson City, Meyers Station, Kyburn, Pacific, Placerville, Clarksville, Mills and Sacramento. Fifteen miles beyond Carson City, taking the fork to the right to Lake Tahoe, a barge will ferry cars to Tahoe Tavern. Lake Tahoe is one of the most beautiful spots in a section noted for its beauty.

The run from Sacramento will be made through Galt, Lodi, Stockton, French Camp, Banta, Livermore and Dublin to Oakland, where from the Mole you will be ferried to San Francisco.

For the journey down the coast on El Camino Real you should pass through Colma, South San Francisco, San Mateo, Redwood, Santa Clara, San Jose, Los Gatos, Soquel, Salinas, Soledad, Jolon, San Miguel, Paso Robles, San Luis Obispo, Arroyo Grande, Los Cruces, Santa Barbara, Ventura, Hollywood, Los Angeles, Santa Ana, San Juan Capistrano, Oceanside, Del Mar to San Diego. The Imperial valley and its transformation by irrigation from a desert to a garden may be seen by a run through Devil's canyon, almost on the Mexican border, El Centro, Brawley, Mecca and Beaumont, returning to Los Angeles by way of San Bernardino. Sand will be encountered in places on this run, particularly between Brawley and Beaumont.

A route which would be less strenuous would be through El Cajon, Lakeside, Bernardo, Escondido, Bonsal, Temecula, Elsinore, Perris, Riverside, Cucamonga, Monrovia, Pasadena to Los Angeles.

To return north you can either retrace the coast route, or, going by way of the valley of the San Joaquin river through Mojave, Bakersfield, Tulare, Fresno, Merced, Modesto and Livermore to San Francisco.

For the northern branch of your journey on the coast, after ferrying from San Francisco to Vallejo, some rough roads will be found as well as excellent stretches before reaching Puget Sound. The itinerary on this portion of the Pacific highway is as follows: Sacramento, Tehama, Redding, Kennett, Delta, Castella, Dunsmuir, Ashland, Grant's Pass, Roseburg, Cottage Grove, Eugene to Portland; and after leaving the City of Roses, the way will lie through Vancouver, LaCenter, Kalama, Castle Rock, Chehalis, Centralia, Grand Mound, Tenio, Tacoma to Seattle.

From Seattle to Spokane is a vigorous ride, and cars are sometimes shipped. However, towns enroute, after ferrying across Lake Washington to Kirkland, are Snoqualmie, Cle Elum, Ellensburg, Malaga, Wenatchee, Douglas, Coulee City, Creston, Davenport, Spokane. Very recent word from Helena advises the following route is now open between Spokane and that place. By state road following the Northern Pacific Railway to Murray, Idaho; thence to Thompson, and again following the Northern Pacific to Missoula and Blackfoot valley to Bonner, Clearwater, Ovando, Lincoln, Flesher; thence via Wilber and Silver to Helena.

Heading to the northeast from Helena to Great Falls you will follow the Bird Tail Divide; thence through Benton, Havre, Chinook, Harlem, Malta, Saco, Hinsdale, Glasgow, Nashua, Wolf Point, Popular, Culbertson, Buford, Williston, White, Earth, Berthold and Minot across the wide, rolling country of the north; thence to Minneapolis via Dogden, Turtle Lake, Canfield, Bismark, Jamestown, Casselton, Wahpeton, Fergus Falls, Alexandria, Sauk Centre, St. Cloud and Anoka. Leaving the Twin Cities, pass through Farmington, Faribault, Owatonna, Blooming Prairie, Austin, St. Ansgar, Osage, Charles City, Janesville to Waterloo; Vinton, Cedar Rapids, Mechanicsville, Clarence, Bennett, Maysville, Davenport, Muscatine, Grand View, Wapello and Burlington to Fort Madison, from which point the route will be familiar, having passed over it on the first part of your trip.

Digressions for the purpose of visiting national parks may be made from Merced, Cal., to Yosemite; from Tacoma, Wash., to Mt. Ranier; from Ravalli, Mont., to Glazier; and from Helena to the Yellowstone.

EVANSVILLE TO EAU CLAIRE

Evansville, Ind.—Editor Motor Age—I would like a route from Evansville, Ind., to Durand, Wis., via Chicago, Milwaukee,

PALA MISSION, PALA, CAL., ON THE EL CAMINO REAL

TRANSCONTINENTAL ROUTE SIGN ERECTED BY TOWN OF TREMONTON, UTAH

Oshkosh, Stevens Point, and Eau Claire.—A Subscriber.

The distance from Evansville to Chicago, via La Fayette, is 334.6 miles, passing the following cities: Evansville, Warrenton, Princeton, Patoka, Hazleton, St. Thomas, Vincennes, over good gravel and macadam roads practically all the way; Bruceville, Oaktown, Carlisle, Paxton, Sullivan, Terre Haute, Mecca, Rockville, Guion Station, Waveland, Crawfordsville, La Fayette, Montmorenci, Wolcott, Remington, Rensselaer, Aix, Virgie, Thayer, Shelby, Crown Point, Schererville, Highlands, Hessville, Grasselli Station, East Chicago, Whiting, South Chicago, Chicago. The road is good gravel practically the entire distance. Complete running directions, Lafayette to Chicago, with map, appeared in Motor Age, May 16, 1912, issue, pages 22 and 23.

There are two routes from Chicago to Milwaukee, one known as the shore route, the other as the inland. If a fast trip is desired the latter would be the one to take under ordinary weather conditions. The shore route over macadam two-thirds of the way—which, by the way, is not in the pink of condition—is as follows: Chicago, Evanston, Wilmette, Kenilworth, Glencoe, Hubbards Hill, Ravinia Park, Highland Park, Lake Forest, Waukegan, Kenosha, Racine, South Milwaukee, Milwaukee, 89.4 miles.

The inland route, 94.9 miles, takes you through small towns only: Chicago, Evanston, Wilmette, Grosse Point, Northfield, Deerfield, Everett Station, Sylvania, Kilburnville, Milwaukee.

Milwaukee to Oshkosh through Fond du Lac is over good gravel road through a fine rolling country, and the towns en route are: Milwaukee, Menominee Falls, Meeker, Schleisingerville, Theresa, Fond du Lac; from this point following the shore route to Oshkosh.

It is about 79 miles to Stevens Points, the road as far as Fremont being a good gravel one; between Amherst and Stevens Point you will encounter gravel stretches and sandy spots. Leaving Oshkosh go through Medina, Dale, Redfield, Fremont, Weyauwega, Waupaca, Amherst, Stevens Point.

Continuing in a northwesterly and westerly direction with Eau Claire your destination, you will find a well-travelled road all the way, with perhaps one or two short bad stretches. The towns on this road are: Junction City, Milladore Station, Auburndale, Marshfield, Mannville, Spokeville, Greenwood, Withee, Stanley, Cadott, Anson, Chippewa Falls, Eau Claire.

LAKE MICHIGAN TO THE MISSISSIPPI

Chicago—Editor Motor Age—Will Motor Age please give me the best route between Chicago and St. Louis, and the condition of the roads at the present time.—Tourist.

A very interesting trip may be made from Chicago to St. Louis by going southwest from the Windy City through La-Grange, following the canal to Joliet, then on through Minooka, Morris, Marsuilles and Ottawa. Fairly good macadam and gravel will be found all the way to Morris. Some dirt roads will be found between Morris and Ottawa. About 15 miles beyond the last named place, Starved Rock, that strategic point in the Indian historic annals of the Middle West, may be seen; and a few miles farther on is Deer Park. LaSalle, Peru and Hollowayville are reached in the order mentioned; then turning to the south pass through Bureau Junction and Putnam to Henry. From here to Chillicothe, a distance of about 9 miles, dirt road will again be found, and 20 miles more will bring you to Peoria.

Fair to good natural dirt roads, most of them kept in excellent shape, will continue to Quincy through the following towns: Farmington, Prairie City, Bushnell, Macomb, Colchester, Tennessee, Plymouth, Augusta, Loraine and Ursa. Running south from Quincy to Hannibal on gravel nearly all the way, cross the Mississippi river at the latter point and continue down the valley through New London, Frankford, Louisiana, Prairieville, Troy, Flint, Wentzville and St. Charles to St. Louis.

KANSAS TO WESTERN TEXAS

Girard, Kansas—Editor Motor Age—Kindly give me the best route from Girard, Kansas, to Amarillo, Texas. I am particularly desirous of knowing the points at which to cross by bridge the Cimarron, Canadian and Beaver rivers; also to evade deep sand and treacherous fords of any streams where quicksand is to be found. We wish to start as soon as possible in our American Tourist car.—Marion Coulter.

Volume 4 of the Blue Book will give you complete running directions for the entire distance, also many side trips.

ROCK ROAD TO PALA MISSION AND RESERVATION

SEATTLE BOULEVARD OVERLOOKING LAKE WASHINGTON

After motoring to Chanute, turn north through Humboldt, Iola, Colony, Garnett, and Richmond to Ottawa. This takes you a round about way but at Ottawa you strike the Santa Fe trail, providing a good road through to Newton via Williamsburg, Waverly, Emporia, Cottonwood Falls, Elmdale, Clements, Florence and Peabody.

The next section of the trip will be south over the Meridian highway and the more important places enroute are Wichita, Wellington, South Haven, Caldwell, Renfrow, Medford, Kremlin, Enid, Hennessey, Dover, Kingfisher and El Reno. South of El Reno 11½ miles the Canadian river is crossed; but good facilities are furnished for this crossing as well as that of the Cimarron river between Dover and Kingfisher, as the Meridian highway is the main travelled north and south thoroughfare in this section. Continue on through Pocassett, Chickasha, Verden, Anardarko, Apache, Lawton, Emerson, Randlett, Burkburnett, Wichita Falls, Windthorst and Jacksboro to Weatherford. The Red river is crossed on a toll bridge between Randlett and Burkburnett.

At Weatherford you will leave the Meridian highway, turning west and going through Mineral Wells, Breckenridge, Albany, Abilene, Sweetwater, Snyder, Post, Slaton, Lubbock, Hale Center, Plainview, Tulia, Happy and Canyon to Amarillo. You may have some rough travel and sand between Weatherford and Sweetwater. At the latter place you will strike the through route from San Angelo to Amarillo, and the remainder of the trip will be over good road. This is the longer way by which to reach Amarillo, but it is the better road.

GOING TO CRIPPLE CREEK

Tyler, Texas—Editor Motor Age—I am contemplating a trip to Cripple Creek, Colo., and would like the best motor car route from Corsicana, Texas, to the point mentioned or to Colorado Springs. Kindly give road conditions, sand, etc.—I. H. Crutcher, Jr.

Motoring through Ennis, Waxahachie, Midlothian, Mansfield and Kennedale to Fort Worth you will there take the Meridian highway following it north as outlined and mapped in last week's issue of Motor Age under directions to the party going from Corpus Christi, Texas, to Denver, Colo.

From Colorado Springs to Cripple Creek your route will be via Manitou, Cascade, Green Mountain Falls, Crystola, Divide and Midland. You should have no difficulty in making this trip as it is over a route traversed by many.

AMARILLO TO SAN ANGELO

San Antonio, Tex.—Editor Motor Age—In Motor Age of July 11, page 22, "Route Through Texas," you advised W. C. Wright, of Saint Francis, Texas, that he had the choice of two roads from Amarillo to Rule, but there are drawbacks to both. The one to Plainview, Lubbock, etc., takes him through the extensive prairies, over cattle trails, and sometimes not even that to guide you. This is a sad mistake, as the road from Amarillo, Plainview, and Lubbock is as fine a country road as you ever saw. You can make this entire trip from Amarillo by way of Plainview, Lubbock, to San Angelo, almost without changing your gears, there being only one or two places that you will have to change, and that is not for want of road by any means, but one or two short, steep hills.

This road is part of the San Antonio-Denver highway, and I am glad to state that with the exception of about 30 miles in the western part of Kerr, and eastern part of Kimble county, we have a very fast road the entire distance from San Antonio to Amarillo, and not only that, but the road is good from Amarillo to Trinidad, with exception of possibly 30 or 35 miles that has not been repaired and may be a little rough, but no sand; and from San Antonio to Alice, we have a fairly good road, there being some sand in Wilson and Bee counties, but not considered bad by any means, there being an average of fifteen to twenty cars per day going over this road between San Antonio and Corpus Christi that keeps the road in splendid condition for automobiles.

On page 24, "Ask for Texas Route," you tell C. H. Lewis, cattle trails are the style of roads he will have to San Antonio. This, of course, is a sad mistake, as he will intersect the San Antonio-Denver highway at San Angelo, and have the road as stated in the case to San Antonio, and also to Rockport, with a fine road from Beeville to Rockport, with some sand in Bee and Wilson counties as stated in the other case.

Motor Age also stated that he would go through New Braunfels out of San Antonio. This is a mistake, as New Braunfels is 32 miles north of San Antonio. He will go through Elmendorf instead of New Braunfels and the balance of your towns are correct.—D. E. Colp, Secretary Chamber of Commerce.

MONSERRAT, SAN DIEGO CO., CAL.

The Read

Axle Bearings Cannot be Supplemented With
—Patriotic Belviderian Scores Rockford Pres
Crude Rubber Is Prepared for General M

Cannot Use Ball Thrust

Excessive Wear on Axle Bushings Cannot be Prevented With Ball-Bearing

FIG. 1—WEARING POINTS ON TIMKEN AXLE

PORT GIBSON, Miss.—Editor Motor Age—I have a touring car with a Timken front axle, very similar to the cut, Fig. 1. I have trouble with the bushings at places marked X and Y, where the king-bolt goes through them. Also there is some wear on the top of the knuckle where it bears on the axle yoke. After replacing these bushings, the car steers very easily until the bushings wear down, when steering is very hard, and the wheels spraddle out some. What would be the opinion of Motor Age of placing a ball thrust bearing in above the steering knuckle where it bears on the axle yoke? Would the balls stand the pressure and jarring over rough roads? I have a plain washer there now that is about ¼ inch thick. I would install new bushings at the same time.—L. Briscoe Allen.

1—The Timken axle you use probably is an old-style, with the straight king-bolt, which wears faster than the improved taper king-bolts with which the newer types are equipped. With plenty of grease in the grease cups, and provided that the car is not too heavy for this size of axle, this axle should stand up for a reasonable length of time notwithstanding, unless used on very sandy roads.

It is quite impractical for you to attempt to insert a ball bearing in the Timken front axle you are using, for the reason that you have not sufficient room to accommodate a ball thrust bearing of adequate dimensions. You have not sufficient stock to make room, and to attempt to use a bearing with balls of insufficient size would be worse than useless. The bushings referred to are hardened steel and inexpensive, and it is suggested that you replace them as worn, being especially attentive to proper lubrication. There are no washers on regular Timken axles, in the place of which you speak, but there are two collars which are part of the bushings, which take the wear from the top of the knuckle at its upper bearing on the axle yoke. In case the axle is too small for the weight of your car, it is suggested that a larger axle be substituted.

This wear might also be caused by distortion of the axle parts, such as the yoke, the knuckle, or the king bolt. The trouble might likewise be due to too light adjustment of the king bolt, by clogged grease cups, not delivering sufficient lubricant, or by a bent axle.

Lost motion in the steering connections might cause this too, as such a fault would permit the wheels to wobble, especially on sandy roads.

OLDS SPEED, WEIGHT, AND ECONOMY

Battleford, Sask.—Editor Motor Age—What is the average fuel mileage per gallon on the Olds Limited six-cylinder car?

2—What is the weight of this car fully equipped?

3—What is the maximum speed of this car?—E. S. B.

1—The average fuel mileage of the 1910 Oldsmobile Limited was about 10 miles per gallon; of the 1911, model 6, and of the 1912, 7.

2—The weight of the Limited is between 4,200 and 4,800 pounds, according to the model and the type of body.

3—These cars have made 68 miles per hour, it is claimed.

Sets Belvide

Rockford Motorist M
techtural Diffic
Freak Ordi

BELVIDERE, Ill.—Edi On page 47, Motor A the caption, "Belvider nance," the statement is dere has an ordinance wl driver of a car taking garage onto a public story of this alleged o fiction. It originated in paper, through the expe ford motorist who, find rule applied to one gara had driven his car, came conclusion the Belvidere such local regulations b

The garage in question main business street at a sidewalk is 3 feet or mo phalt pavement. A cro trians, which is necessari street on a sharp grade, i in front of the entranc Because of the location and the consequent dang cases of cars being backe or inexperienced drivers, the garage agreed to us an entrance only, when m for his permit from the c rule is not ironclad and the rush hours only.

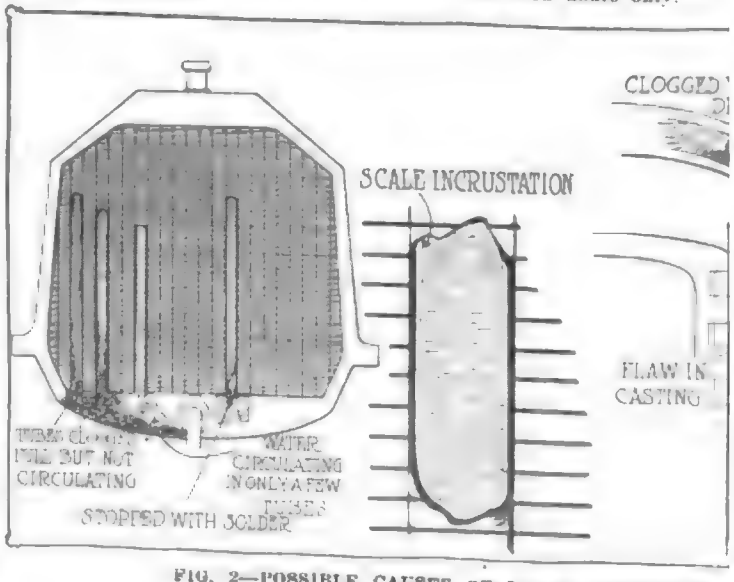


FIG. 2—POSSIBLE CAUSES OF BUICK OVERHEATING

Clearing House

Causes of Overheating of Motor Are Legion—How to Charge Batteries with Direct Current Generator—Distinction Between Steering Types Explained—Grease Not for Valves

Charging With Exciter

Diagram of Wiring for Battery Charging With Direct-Current Dynamo

MIDDLETOWN, Pa.—Editor Motor Age.—Please give wiring diagram and instructions to charge storage battery from direct-current exciter.—Reader.

1—The source of current, provided it be uniform and of direct current, matters very little in charging a storage battery. The wiring should be as shown in Fig. 3. An ammeter of from 10 to 15 amperes capacity should be used, and a voltmeter of from 10 to 30 volts, wired as shown. Three types of resistance may be employed, water resistance, which consists of an open tank of water with two wires hanging from wooden supports, immersed, the resistance of which type depends upon the distance between the wire ends; lamp resistance, which consists of a bank of incandescent bulbs wired in parallel, the resistance depending upon the size and number of lamps used; and a rheostat, or metallic resistance, which is adjustable by means of a lever or crank. The latter is the most convenient, also the most expensive. For a small plant the electric lights will serve the purpose equally well, and are cheap. The first method will do for temporary jobs, and possesses the virtue of extreme economy.

The resistance, once determined as to type, will have to be graded according to the strength of the current generated by the dynamo. It will be found, with a direct-current exciter, that the voltage will be rather high in proportion to the amperage, and for this reason, charging with this type of current source will take longer than with the use of the ordinary type, as, due to the relatively slow velocity of a low-ampere current, a longer time will be required to build up the required amperage. The resistance should be sufficient in charging ordinary storage accumulators to step the current down to about 2.5 times the number of cells, which in the case of two cells, would be 5 volts. This should be done with the dynamo running slowly, and when started, the speed of the dynamo should be increased until the ammeter reads about 3 amperes. This will increase both the voltage and amperage together. With an increase of voltage the current may at first decrease to zero, and then increase. If no change in the speed of the exciter is possible, the same effect may be secured by manipulating the adjustments of resistance.

The voltage will now increase, its rate of increase being indicated on the voltmeter. It should be allowed to increase to 2½ volts per cell, when either the resistance should be increased or the speed of the dynamo decreased to show an amperage of 1, at which current the voltage should again climb to 2.5 per cell, and the battery will be fully charged.

DO NOT GREASE VALVES

Marinette, Wis.—Editor Motor Age—I have a car which has the valves inclosed same as on the Kissell six. Would it do any damage if I put fibre grease in around the valves and would there be any danger of the grease getting under the valve seat? I have heard the Packard does this. Is it true?—H. E. S.

The lubrication of the valves is well provided for in any well designed motor, and sponge grease put about the valves in the manner you suggest would be quite likely to get on the seats and carbonize and gum the valves. The Kissel company advises strongly against such practice, as worse than useless. The Packard company has never advised the use of fiber grease on its inclosed valves. Follow the advice of the manufacturer in this regard, as given in the instruction book.

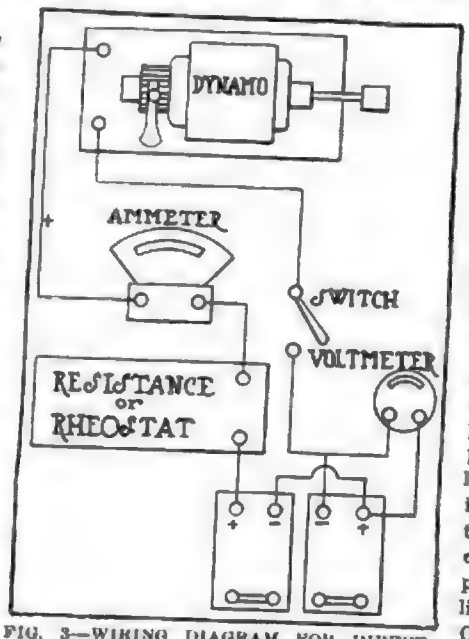


FIG. 3—WIRING DIAGRAM FOR DIRECT CURRENT CHARGING

Buick Cooling Troubles

Motor Overheats With Full Radiator — Holds Repaired Radiator Blameless

CINCINNATI, O.—Editor Motor Age—I have a model 14 Buick runabout, which was purchased new in this city in October, 1910, and the original owner claims not to have run it to exceed 200 miles. I bought it in June, 1911. It is a two-cylinder, opposed motor. To date the car has not been run to exceed 1,000 or 1,200 miles. The trouble is it heats the water excessively, using about 1 gallon to 7 or 8 miles. Have had it overhauled by several and they pronounce it to be in good working order; has good power and it performs satisfactorily, only uses too much water. It has a thermo-syphon system of cooling.

Recently I had a pump installed, but this does not lessen the consumption and heating of water. Have had new 1¼-inch hose put in the circulating system and thoroughly traced water course for any stoppage, but none to be found. Seems to boil the water in the jackets like when water is poured on a hot stove. The original radiator was somewhat battered on the inside by the fan wheel getting loose, and I had the radiator reconstructed so as to hold about a gallon more water. It heats as much now as with the original one. So I do not think it is in the radiator as it got just as steaming hot before I had any change made thereon. Have had the timing changed, which has helped the speed and power at least 25 per cent. Use plenty of lubrication but this does not seem to help any.

The maker claims it is all in the radiator, but I do not think so, as the original one heated the same. Would like to hear from any one who can suggest a remedy for this trouble. Have tried a dozen or more suggestions but with no results. What does Motor Age think is the cause? There is no stoppage in the water circulation; carbureter works well and no misfires; everything else is all right.—A. W. Snyder.

The Buick Model 14 uses a vertical-tube radiator, in which the water runs simultaneously through all tubes. If your radiator ever worked properly, a repair such as you speak of could not increase its capacity by a gallon. It may be, however, that prior to the accident a part of the radiator, a tube or two, was closed, and when the radiator was repaired, was opened up. The water capacity of this cooling system is 2½ gallons, and if it does not hold this much, is radically wrong. It may be possible that while your system is up to normal capacity, the water does not circulate properly, due to an obstruction in the line, perhaps in the cylinder passages. Continued use of hard water may have deposited a scale in the interior of the

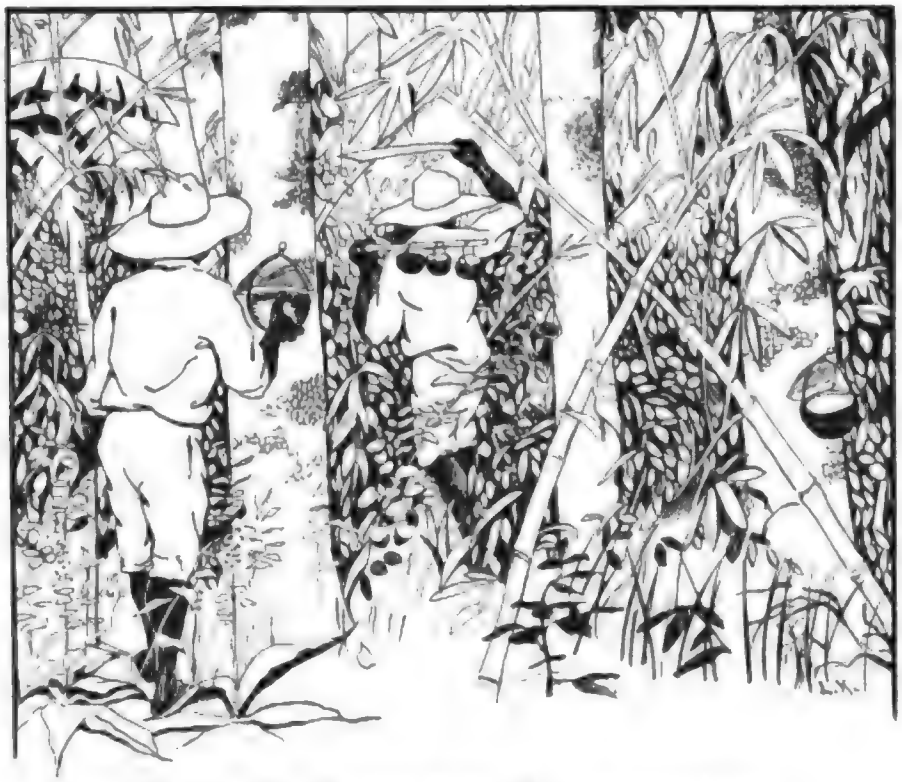


FIG. 4—GATHERING RUBBER LATEX IN THE AMAZON VALLEY

radiator that prevents proper radiation. To determine which of these is the case, or if none of them, what the real difficulty is, proceed as follows, always remembering that it is not a fault in design and therefore the result of an abnormal condition. Model 14 Buicks are usually well-cooled cars.

First drain out your radiator and cooling system, refilling it with clean water. Measure the amount that you put in, and if it is not as much as 2½ gallons, you may know that your system is not of normal capacity, due either to stoppages in repairing the radiator, or core sand or deposit from dirty or alkali water. When the radiator is full start your motor, and let it run until the water is hot, then feel all of the tubes in the radiator. If any of them are cool, they are not circulating, and are probably clogged or closed through an error in manufacture or repair, although they may be filled with still water. Next, to test the circulation, disconnect the outlet hose, and with the motor running, run fresh water into the radiator to take the place of the water running from the disconnected exhaust. Drop some aniline color or ink into the radiator, watching the outlet to determine how long it will take it to run through the system. If it comes through greatly diluted, and continues to come long after the last is put into the radiator, there is an obstruction in the passages which allows the water to pass only very slowly, and may be due to caked core sand and scale, or vegetable matter or sand in the water, introduced into the circulation by careless straining of the water. It is barely possible that a lump of iron was left by the core in casting that escaped the notice of the inspectors when tested before sale.

If, after all of these tests, it is found that the cooling system accommodates its full capacity of fluid, that it reaches every surface of the radiator, and that the circulation is rapid and thorough, your overheating must be due to errors in driving, to-wit, running on retarded spark, in low gear, or with an overrich mixture, or to a deposit of scale on the interior of the radiating surfaces, which prevents proper radiation. If the former, the remedy is obvious, if the latter, the system should be cleaned with one of the numerous radiator cleaning compounds, which have been described in Motor Age in recent issues.

If it is found that the water is not circulating through all of the radiator tubes, the radiator should be thoroughly cleaned and overhauled, and the ends of the tubes inspected if possible. If there are obstructions in the cylinder passages, their nature should first be learned, and if possible immediately removed. If it is found to be a flaw in the casting, it may be necessary to replace the cylinder, if no way can be found of reaching it from the outside.

Fig. 2, illustrates three conditions that might also cause your trouble. Overheating is also caused by an over rich mixture. This, while elementary, is none the less a frequent cause of such trouble, and no motorist can afford not to consider it. Late spark timing or running on a retarded spark is another frequent cause of overheating. Low gear running is a cause of overheating that need not be mentioned. Cooling troubles are nearly always the result of specific derangements peculiar to the car.

STEERING GEAR DIFFERENCES

Portland, Ore.—Editor Motor Age—To settle an argument please give the definition of an irreversible steering apparatus as applied to a motor car? What kind has the Cadillac?—Phillip Van Der Kar.

An irreversible steering gear is a device that permits the wheels of a vehicle to be turned by means of a suitable hand wheel or lever, but which restricts their movement to that which is caused by such control. With its use, ruts or obstructions in the road can have no effect on the direction of the wheels. The non-irreversible steering gear allows control over the wheels by a wheel or lever in the same manner as the irreversible type, but is not immune to the action of the surface irregularities of the road. Steering gears may be tested as to irreversibility by jacking up the front wheels and kicking sideways the front or rear portion of one of the tires. If the steering wheel turns, the gear is not irreversible, but if no amount of pressure on the road wheels can turn the hand wheel, the gear is irreversible. The identity of a given gear as to type also may be determined by examination of its mechanism. There are three general types of non-irreversible types of steering gears, the rack and pinion, which is now used only on some of the lower priced commercial cars, the pinion and sector type and the bevel-gear type. These cannot be made irreversible, and rely on reduction to secure the margin of safety on rough roads. Irreversible types are made in three principal types, the worm-and-nut, the worm-and-gear or worm-and-sector, and the ball-bearing type, which is a patented article used for lever steer on an electric. The first two types are practically universal in irreversibly steered gasoline motor car practice. The Cadillac gear is of the worm-and-sector type and irreversible.

From the foregoing, however, it is not to be inferred that all worm-gear steering gears are irreversible. Whether or not a gear or toothed section may turn a worm or screw depends upon the pitch.

WORM DRIVE IN AMERICA

Peru, Ind.—Editor Motor Age—Are there any touring cars using Reynold's rotary valve motor; if so, what are they and where are they made?

2—Does the Peerless Motor Car Co. make its own rear axles? If not, where does it get them?

3—Are there any American cars using the worm drive, and where are they made? —A. L. Snyder.

1—No cars using the Reynolds rotary valve motor have yet been placed upon the market.

2—The Peerless Motor Car Co. manufactures its own axles.

3—The Smith and Peerless trucks use

the worm drive, and the Flanders and Maxim-Goodridge electrics, but no American pleasure cars have as yet ventured to make this departure. There are rumors, however, that certain established manufacturers are contemplating the introduction of a worm gear gasoline pleasure car for the 1913 season. The Atlas cars, with Knight engine, made early in 1912, had a worm-driven rear axle, but these cars are not being manufactured at present.

GASOLINE AS A LUBRICANT

Ellis Island, N. Y.—Editor Motor Age—I would like to know something about the properties of gasoline as a lubricant. Would a bearing which is constantly bathed in gasoline and of large size, revolving at a speed not over sixty or seventy revolutions per minute with a light load be likely to heat up if no other lubricant than the gasoline were supplied?—M. H. Foster, M. D.

Gasoline is absolutely worthless as a lubricant. As a cooling factor it is about as good as water. With a bearing such as you describe, provided it was smooth or polished, no lubricant would be necessary, although a cooling fluid would be advisable. Would suggest that such a bearing be packed in plumbago or graphite, as the gasoline will not wash this substance away.

BATTERY FOR ATWATER KENT

Toledo, O.—Editor Motor Age—Why is it that the Atwater Kent uni-sparker is never used in connection with a storage battery and what would result if so used?—Fred J. Swartz.

You are mistaken in your idea that storage batteries are never used in connection with the Atwater Kent system. Very good results are obtained from this combination, when the proper type of battery is used. Ordinary 6-volt batteries are sometimes used, but they do not give as satisfactory results as those of higher voltage. The best results are obtained from the use of 8-volt liquid type batteries, whose voltage remains practically stationary, regardless of degree of discharge. This composition is rarely found in cells of under 80 amperes capacity. The gelatine composition of the smaller sizes, permits the voltage to decrease in proportion to the discharge, and soon permits it to get below the minimum for efficient operation of this system, which is 6-volts. The reason why accumulators are so seldom used as a current source for the Uni-sparker is because of the superior economy and length of life without renewal of dry batteries. Storage batteries were introduced into the ignition field because of the excessive current consumption of the vibrating-coil systems. The economy of the Atwater Kent system renders them unnecessary, but not inapplicable. The Atwater Kent system is of the mechanical break jump-spark type, and the induction is therefore not as high as the vibrator jump-spark system, hence a higher primary voltage is required.

Treatment of Rubber

How Rubber in the Raw is Gathered and Prepared for the Market

BARDSTOWN, Ky.—Editor Motor Age—What kind of radiators have the 1912 Pope-Hartford cars?

2—Are they as efficient as the square-tube radiators?

3—Has the six-cylinder car a T-inlet manifold?

4—What are the methods used in getting rubber from the tree and preparing it for market?

5—Does it come from the bark or the tree?

6—How often are shipments of rubber made to this country?

7—When is the rubber gathered?

8—Is there any prospect of the price of rubber going down to 50 cents or 75 cents per pound?—Claude W. Wilson.

1—The Pope-Hartford radiator is of a special design that cannot be classified. It is built in sections with both horizontal and vertical tubes, the former preponderating.

2—The Pope company has never had cause for dissatisfaction with its radiators, and believes them to be the equal of any other type.

3—Yes.

4—The question is too deep to enter into thoroughly. Briefly, it is collected in the latex state, by the following processes: a. Tapping as for maple sap, by cutting a gash in the tree and catching the dripping sap in suspended cups. b. By cutting slanting grooves, in some cases in the shape of herring bones, in the tree, leading to a common collecting cup. c. Felling the tree, and cutting annular rings along the full length of the trunk, spaced at 2-foot intervals, the rubber being caught in individual cups. d. Tapping the vines, which also yield rubber, allowing the sap to coagulate itself, scraping off the coagulated mass when the vine has been completely bled. e. The extraction of rubber from the roots of these vines by a pounding process. f. The cutting out of sections of the trunk to facilitate rapid gathering at the expense of quality and the life of the tree. g. Tapping and coagulating on a small gutta-percht core. h. In the case of guayule, the Mexican rubber shrub, it is extracted by making a pulp of the whole plant, between rollers, and allowing the rubber to rise, as cream off of milk, when it is skimmed from the pulp of the plant.

Rubber is prepared for market as crude rubber, by a process of coagulation and purificatio process of coagulation and purification, the chief of which ahe enumerated as follows: a. Smoking, in which the latex or rubber milk, is coagulated by means of smoke and heat from a fire of palm nuts, on a wooden paddle. b. Sun curing. c. Coagulation in hollows in the earth or hollow tree trunks, by the aid of soap, lime, or potash. d. Coagulation on the tree or plant, as it oozes from the cuts. e. Coagulation in clay pits. f. Coagulation over a gutta core. g. Coagulation by boiling. h. Coagulation in small pans with the aid of acetic acid. i. The Mexican method of coagulation in vats.

All rubber at some stage of manufacture is smoke-cured, and when manufactured on a large scale, as on plantations, it is made into the form of crepe and sheets.

5—Rubber from trees comes from the sapwood of the trunk itself. It is also obtained from the stems of certain vines and their roots, and from the guayule shrubs.

6—Shipments of rubber to the United States are made very irregularly, the shipments for 1911 total, however, 82,921,465 tons. As near as may be estimated, shipments of crude rubber are made from Para to New York on an average of about thee times a month.

7—Rubber is tapped in the spring of the year, which in South America is in September and October.

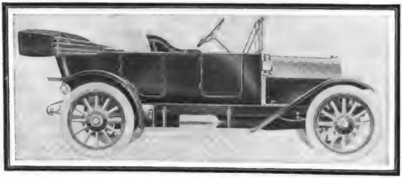
8—In view of the extensive cultivation of rubber that is now being done, and the plans for further enterprise along this line that are constantly being made; in consideration of the promises of eminent scientists to produce a practical synthetic rubber at much less cost than is required to obtain it in its natural state, and taking into account the advances that are being made in the economical collection of wild rubber, there seems to be much reason for the sanguine opinions of many on this subject. That it will reach 75 cents a pound is likely, but as for reaching as low a figure as 50 cents, opinions are speculative.

FIG. 5—BRAZILIAN METHOD OF COAGULATION

Overland in Two Chassis Mc

OVERLAND cars for the coming season will be mounted on two chassis, model 69 replacing 59 and 71 replacing the 1912 model 61. The new cars present no radical differences from the Overland construction which has been in vogue for several seasons. Mechanically, they are very similar to one another and differ only in sizes of parts and in a few minor constructional details. Both motors are of the four-cylinder, L-head type, each cylinder being cast separately. The cylinder dimensions are given below:

	Horsepower	Bore	Stroke	Ratio
Model 69....	30	4 in.	4½ in.	1.12
Model 71....	45	4⅜ in.	4½ in.	1.03



MODEL 69 ROADSTER FOR 1913

Design features of the Overland motors are of the usual type. The valves are interchangeable and are provided with nickel-steel heads. For the model 69 motor, they have a diameter of 1 13/16 inches and for the 71 motor 2⅛ inches. They are operated by the conventional type of tappets which bear directly on the cams. The camshafts are of drop-forged steel with the cams integral, and are mounted on three bearings as follows:

MODEL 71 MOTOR

Front: Length 2 11/16 inches; diameter 1 inch
Center: Length 2⅝ inches; diameter 1 inch
Rear: Length 2¼ inches; diameter 1 inch

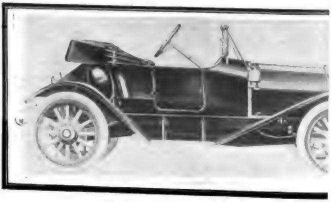
MODEL 69 MOTOR

Front: Length 2 1/16 inches; diameter 13/16 inch
Center: Length 2 3/16 or 2 1/16 inches; diameter 13/16 inch
Rear: Length 2 1/16 inches; diameter 13/16 inch

The pistons are fitted with three rings each and at their lower ends they have oil grooves, each groove being provided with six drain holes which are equally spaced around the piston circumference and which form an outlet for the excess oil and prevent it from getting up to the piston heads. This is a new feature. The wrist-pin bosses are amply large and wrist pins are fixed to them. The crankshafts are provided with five bearings each, one bearing between each two cylinders, and one at either end of the motor.

On both motors all crankshaft bearings have a diameter of 1½ inches. All crankshaft bearings except the rear of model 69 motor have a length of 1¾ inch. This rear bearing has a length of 3⅛ inches. As to the model 71 motor, the three center bearings are each 1¾ inches long, the front bearing 1⅞ inches long, and the rear 4⅜ inches. The connecting rods are the same material as the crankshaft, namely; drop-forged, carbon steel. . The lower connecting rod bearings for the model 69 motor are 1½ inches in diameter by 1¾ inches in length, while these dimensions for the larger engine are 1⅝ by 2⅛ inches respectively.

The lubrication of the two motors is not the same, that of model 69 being partly by splash and partly mechanical. The crankshaft bearings as well as those of the connecting-rods are lubricated by the oil splashed into them by the lower ends of the connecting rods dipping into the oil contained in the lower part of the crankcase. This provides for all the lower bearings, while the cylinders are lubricated by a force-feed oiler which is cam-operated, as shown in one of the illustrations herewith. Its cam is mounted directly on the camshaft. The three oil grooves already mentioned distribute the oil which is sent to the cylinder walls by this mechanical oiler.



OVERLAND MODEL 69 TOURING CAR

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No Radical Changes Made for 1913

when the lamps are not required is passed to the storage battery. Whenever the lighting current required is in excess of that being generated, the supply contained in the storage battery is drawn upon to assist. Whenever the car has a speed of 10 miles or more, the current passes directly to the lights, and any excess amount produced goes to the storage battery. The generator produces its maximum current when the car is moving at a speed of 18 miles an hour, or more. Its maximum output is 10 amperes.

The motors are suspended in a type of subframe. This consists of a cross piece at the front end to which the crankcase fastens, and two diagonal members one at either side at the rear of the crankcase. These bolt to the side frame members and run diagonally to the cross member which is placed just to the rear of the flywheel. One of the rear arms of the crankcase bolts to each of these rear subframe members.

OVERLAND MODEL 71 ROADSTER

The clutch is of the cone type on both models, and from this point the power is conveyed to the gearbox on the rear axle through a propeller shaft which is inclosed within a torque tube. The latter is fastened at its front end to a cross member of the frame by means of the U-shaped construction of its front end. There is a joint to the frame member at either side of the drive shaft, as shown in the top view of the chassis herewith. The rear end of the torque tube bolts directly to the gearset housing, which is mounted a little forward of the rear axle proper, and which in turn bolts to the axle housing. To maintain the proper alignment of the rear axle at all times, there are two radius rods, which run from the center of the cross member to which the torque tube arms bolt back to the rear axle at either side near the brake drums.

The gearset in all essentials is the same for both models, also. It is of the three-speed, selective sliding-gear type. The gear ratios for the two models, however, are different, and are given below:

Model 69—High: 1 to 1; intermediate: 1.55 to 1; low: 2.57 to 1; reverse: 3.30 to 1.

Model 71—High: 1 to 1; intermediate: 1.72 to 1; low: 3.2 to 1; reverse: 3.93 to 1.

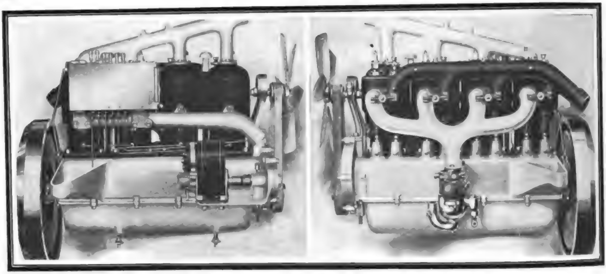
The rear axle of model 69 is what is known as the three-quarter floating type, while that of model 71 is floating, the distinction being that while with both types the load is carried entirely by the housings and not by the axle shafts, these shafts of the former, besides holding the rear wheels in place, also drive these wheels. The axle shafts of the floating type have only the one function to perform—that of turning the rear wheels. The wheels are fastened to the housing in this type, and the axle shafts may be taken out without removal of the wheels. The differential and wheels of model 69 axle are mounted on Hyatt roller bearings, while with model 71 these parts run on Timken roller bearings. As the Timken bearings are combined radial and thrust types, no other bearings are required, but in the model 69 axle the side thrust of the differential is taken up by a ball thrust bearing on either side. Special provision is made in each axle to prevent the leakage of the lubricant from the housings.

MODEL 71 TOURING CAR OF 1913 OVERLAND

The brakes on both models are alike both mechanically and in size. They have a diameter of 13 inches and are 2¼ inches in width. This size represents an increase over the 1912 model for the smaller car. The brake operation has been somewhat simplified. Emergency brakes are internal expanding, while the service or foot brakes are external contracting. The former operate through the use of cams, which cause the brake shoes to expand. The external brake bands operate by means of lever arrangements. The brake-equalizing device as applied to the 1913 cars is new to Overland design. The same principle of equalizing the brake pull by means of cross rods as usually employed is found, but the manner of working it out is somewhat different. Instead of two brake operating shafts, as formerly used on the model 59 Overland, the new models are equipped with an assembly consisting of a tube and a shaft, thus doing away with one of the shafts and simplifying the construction.

As to the frames, these are well-braced throughout with side members. Each is dropped as the body views will show, and that of model 69 is uniformly ¼ inch less in dimension than model 71. The latter has a depth of 4 inches and a face width of 1½ inches. This applies to the side rails, which are of channel-section, cold-rolled steel. Model 69 frame is of No. 9 United States gauge (.156 inch) and model 71 of No. 8 United States gauge (.172 inch) thickness. The top view of the chassis of model 69 will show where the various cross members are placed. These have relatively the same locations and form for model 71.

As to the springs, they are half-elliptic in front on all models, full-elliptic in the rear on model 69, and three-quarter elliptic in the rear on model 71. The details of these springs follow:



RIGHT AND LEFT SIDES OF OVERLAND MOTOR FOR 1913 SEASON

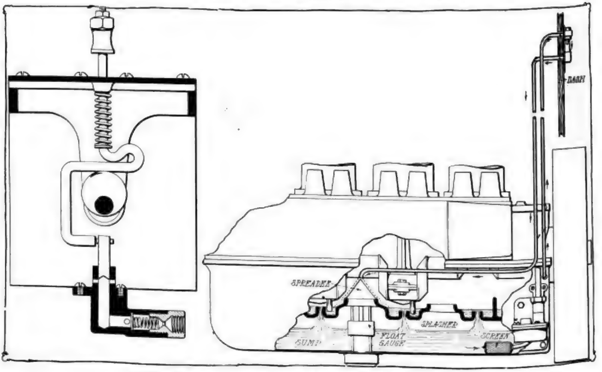
Model 69—Front: Length, 36 inches; width, 1¾ inches. Rear: Length, 42 inches; width, 1¾ inches. Number of leaves: Six.
Model 71—Front: Length, 38 inches; width, 2¼ inches. Rear: Length, 44 inches; width, 2¼ inches. Number of leaves: Seven.

The wheels are all fitted with quick-detachable tires, the size for model 69 being 32 by 3½ inches, while that for model 71 is 34 by 4 inches. The front wheels of both models are mounted on Timken roller bearings.

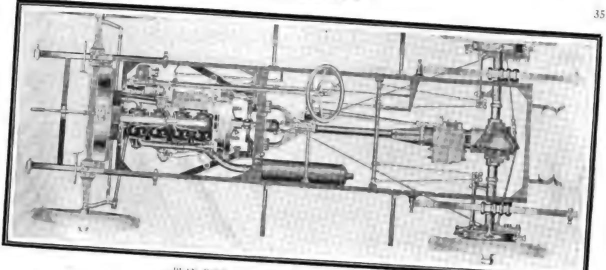
The steering gear is of the full worm-and-gear type, and is adjustable. On top of the steering wheel, the control levers are mounted on the usual type of quadrant. The steering is right-handed, while the gear-shift and emergency brake levers are placed in the center. The gear-shift lever operates through the conventional form of H-gate.

Bodies on all models have been refined, and given a deeper and longer design. Seats also have been made somewhat deeper and lower. The roadsters are equipped with tool boxes in the rear of the seats back of the fuel tanks. These boxes have slanting tops, and tire irons are also provided so that spares may be mounted above the boxes. On model 71, the tool boxes running the lengths of the running boards have been retained, which, while affording all the necessary room, give the clear running board appearance. The wheelbases of the two chassis are 110 inches and 114 inches, the former being for the model 69 and being an increase of 4 inches over that of the preceding model 59, while the latter applies to model 71.

Equipment for the two for the 1913



CRANKCASE SPLASH OILING SYSTEM ON THE OVERLAND MOTORS FOR 1913



PLAN VIEW OF CHASSIS OF OVERLAND MODEL 69

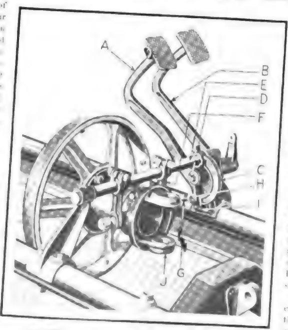
season is most complete. The list price for model 71 includes mohair top and top envelope, acetylene self-starter with Prest-O-Lite tank, robe rail, foot rest, speedometer, complete electric lighting outfit, tire irons, running board tool boxes, horn and full complement of tools. Model 69 is fitted with acetylene self-starter, two gas headlights, gas tank, side and tail oil lamps, battery, horn, tools, mohair top and envelope, windshield, speedometer and tire carriers.

Details of New Regal Clutch Control

THERE has been adopted by one maker of motor cars at least, a policy in regard to publicity which could be followed by others with benefit to makers and readers as well. This is the method of keeping the public informed as to the details of construction and design of the different elements of the car by a short article descriptive of some part or feature with a clear illustration of that feature. From time to time there have appeared in Motor Age bits of information in regard to the construction or design of Regal cars, once it was the gearset, another time the rear axle, etc. This time it is an improvement in the clutch mechanism that is elucidated, and it is this that has called forth the foregoing comment.

To provide a clutch spring heavy enough to hold the clutch engaged so as to always transmit the maximum power of a motor and, at the same time, avoid the necessity of excessive pressure on the clutch pedal to disengage the clutch, is a problem which often confronts the motor car designer. On the Regal underslung model T touring car and model N Roadster, this problem is solved by providing a special combination of levers so that a child, it is claimed, can easily operate the clutch.

By referring to the illustration, it will be seen that the clutch pedal A is carried on a shaft D which is below the main clutch operating shaft E. The pedal is extended below its shaft and through the lower end is a screw G locked in place with a nut H. The end of this screw comes in contact with the lower end of lever C which is keyed rigidly to the clutch operating shaft, downward from which levers extend which engage the collar that throws out the clutch. It will be noticed that the effective length of lever C is considerably greater than the length of the lower part of the clutch pedal which operates as a lever applying pressure to the end of C, consequently the turning effort applied to the clutch operating shaft E is correspondingly greater than it would be if the clutch pedal itself were keyed directly to it.

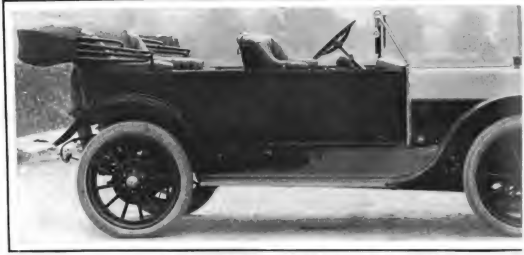


FEATURES OF NEW REGAL CLUTCH MECHANISM

To prevent the lever C and the nut of the screw G from striking together and causing an annoying rattle, the coil spring I is provided. An adjustment feature which permits of setting the clutch pedal in its proper relation to the floor board is obtained by the screw G. It will be noticed that to raise the pedal pad, this screw can be turned to the pedal arm and back out if it is desired to lower the pad, the nut H locking the screw in the desired position.

Of interest in Regal design in connection with this member is the tubular sub-frame, which recalls the practice of some French manufacturers.

Haynes Features Electric Sy



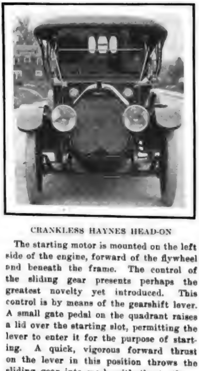
HAYNES MODEL 22 TOURING CAR SHOWING CLEAN BODY LINES

ADDING one more to the growing number of constitutionally self-starting cars that are making their appearance on the 1913 market, the Haynes appears in but one model for 1913, the model 22, which is the development of last year's model 21. The Haynes line of 1912 included two other models, one larger and the other smaller than the 21, which have been discontinued for the coming season.

This chassis bears close resemblance to its predecessor; embodying the characteristic Haynes T-head, 4-cylinder, long-stroke power plant and liberal wheelbase.

The new model shows many added features, improvements, and refinements over 1912, but withal the new model embodies few radical departures. The most interesting innovation is the new built-in electric-lighting and self-starting system. It consists of two separate but correlated elements, the generator and cut-out, and the battery, self-starting motor, and lamp system. The 12-volt generator is situated on the right side of the motor and is driven from the right camshaft. It is wired to a cut-out on the dash, which alike automatically prevents overcharge of the battery and leakage of current from thence to the generator armature at slow speeds. The battery is carried on the left running board, and is of 100 ampere hours capacity. All five lamps are supplied from this battery, but three wires being used in connecting them.

The self-starting motor, which also is supplied from this battery, has, like the generator, but two connections. It is geared to the flywheel by means of teeth cut in the latter's periphery, a sliding gear on a short idler shaft, geared direct to the motor armature, meshing with these teeth.



CRANKLESS HAYNES HEAD-ON

The starting motor is mounted on the left side of the engine, forward of the flywheel and beneath the frame. The control of the sliding gear presents perhaps the greatest novelty yet introduced. This control is by means of the gearshift lever. A small gate pedal on the quadrant raises a lid over the starting slot, permitting the lever to enter it for the purpose of starting. A quick, vigorous forward thrust on the lever in this position throws the sliding gear into mesh with the teeth on the flywheel and starts the motor. Upon the response of the engine, the lever, on being released, is automatically returned to neutral by means of a spring, and the gate closed; when the lever is used in its normal function of gear shifting. The quadrant is further notable in that it is completely and legibly calibrated to avoid confusion of its many functions. It is provided with a small perforated lug, the hole in which registers
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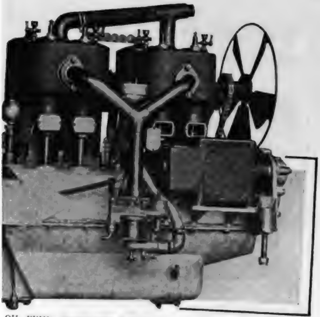

OIL PUMP, GENERATOR AND TOOTHED FLYWHEEL

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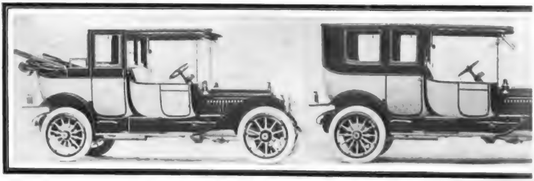
, over the rear axle.

Motor control is by spark and throttle levers on top of the wheel, and by a special carbureter adjustment for starting in cold weather, located on the steering column. A foot accelerator is placed to the right of the brake pedal.

Steering is by worm-and-gear, with a corrugated hand-wheel. The front axle is of Timken manufacture, a 2-inch drop forged I-beam type. The tie-rod is carried at the rear of the axle and is suitably dropped. The tires are 36 by 4½, the tire width having been increased ½-inch over last year.

ITION SYSTEM WITH SPECIAL GEARSET QUADRANT

Packard Enters Little Six



PACKARD 38 LITTLE SIX LIMOUSINE AND LANDAULET FOR 1913 SEASON

TO meet the demand for a medium-powered six-cylinder car, the Packard Motor Car Co. will place upon the market within a month a smaller six-cylinder model than its model 48, which made its initial appearance last season. The new model will be known as model 38, deriving its name from its S. A. E. horsepower rating of 38 horsepower.

In the standard body types of touring cars and phaetons, this latest addition to the Packard line has a wheelbase of 134 and 138 inches, respectively. With roadster or runabout body the wheelbase is 115½ inches. Other body types, such as limousines, landaulets, broughams and coupes are furnished on the new chassis.

Several features of the new car are entirely different from former Packard construction. These are the left-hand drive and control, the combination electric starting, lighting and ignition system and the placing of starting ignition, lighting and carbureter controls on the steering column. The last named feature is entirely new and appears for the first time on any car, it being devised entirely by the Packard company.

Body features remain distinctly Packard. The characteristic shape of the hood which has distinguished these cars ever since their inception is found on the new 38, while in all other respects there can be noticed no departure from accepted Packard body design.

The 38 motor is entirely new. Not since 1906 has any Packard model been equipped with an L-head motor. But this is the type which is used on the new six. The cylinders, which are cast in pairs, have a bore of 4 inches and a stroke of 5½ inches, giving a stroke-bore ratio of 1.375. The stroke is the same as that of model 48 six, which is a T-head type of motor, and which presents the same design features as those of the four-cylinder models.

Another entirely new feature of the motor is the inclosing of the valves by cover plates, one plate for each pair of cylinders. The valves are all on the right side, while the carbureter is placed on the left. Hence the intake manifolding, after it leaves the carbureter, is split up into three branches, one connecting to each pair of cylinders. These manifold branches pass between each block of cylinders to the valve side of the motor and not over the top of the cylinders as is done in some designs in which valves and carbureter are on opposite sides.

Referring to the horsepower curve, it will be seen that while the new six has a rating of 38 horsepower, this figure is only nominal, as the motor is capable of developing an actual maximum of 60 horsepower at a speed of 1,600 revolutions per minute. Still further reference to the curve shows that at a speed of 1,000 revolutions a minute, the developed horsepower is about 47. The rated horsepower is obtained at about 800 revolutions, still further evidence of the inaccuracy of the present S. A. E. formula when applied to motors having a long stroke.

As to the other features of the motor, it may be said that they conform strictly to general Packard design. The carbureter is of the same type as used on the other models, making use of a diaphragm governor. The water pump and governor, however, while performing their related functions in exactly the same way as on previous models, are separate in the new 38.

To those not familiar with the Packard type of carbureter, it might be briefly said that its hydraulic governor has a tendency to maintain a uniform engine speed. The diaphragm of this governor is in contact with the water on one side, and the pressure of the water system has a tendency to bulge it out, the amount of the bulge depending on the water pressure, which increases or decreases with the increase or decrease of the engine speed.

The other side of the diaphragm is connected with the carbureter throttle, and hence the greater the bulge, the more the throttle is moved and the less fuel is admitted to the motor. It will be seen
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As to the lubricatin
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on the 48 motor are al
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Taking up the other
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motor has three-point suspension, due to the fact that there is only one support in the front which is on a bearing in the center of a heavy cross member. This construction is common to all Packards.

Considering the new Packard features, the adoption of left drive and control is perhaps the most significant. This consists of the placing of the gearshift lever and the emergency brake lever at the driver's left and next to the left front door, in addition to the placing of the steering wheel on the left side.

Unique in its construction and in its functions is the control board, so called, which places within easy reach of the driver all switches and other controls which are necessary to the operation of the car at any time. A plan sketch of the new control board is shown herewith. Referring to this diagram, it will be seen that all the lighting switches are placed in a row at the left side, while the switches which govern the ignition, dry cell and generator currents are provided with a lock, which prevents the use of any of the electrical apparatus. To the right of the board, the carbureter adjustment indicator is placed. This indicator operates in connection with the lever mounted on the steering column below the control board. The button marked "starting shutter" is for use in partially throttling the air supply to the carbureter so as to facilitate starting by furnishing a rich mixture to the cylinders. It operates by being pulled up until a stop is reached.

The location of the new control board on the steering column is shown in the body illustrations. It is placed underneath the wheel, and enough below it so that the hand may have plenty of room. The board is stationary, as the outer steering column does not move, the steering rod turning within it. The use of this control board takes practically all the apparatus off the dash. The only devices which remain there are the speedometer, oil gauge, fuel tank pressure gauge and priming button. The latter is placed within easy reach of the driver's foot and is for cold weather use. Pushing it sends charges of acetylene gas to the cylinders to aid in starting the motor. The acetylene is contained in a tank which is carried at the lower left side of the hood as shown in the body illustration.

The combined electric starting, lighting and ignition system on the new 38 is seen for the first time on a Packard model. For starting the engine, the electric generator is temporarily converted into a motor and by drawing current from the storage battery turns the crankshaft. The system is of the Delco type, which has been explained several times in these columns. On the outer rim of the flywheel, teeth are cut, which mesh with those of the motor-generator gear for starting. To crank the motor, the driver simply presses the starter button on the control board, and at the same time presses down on the clutch pedal. This automatically engages the electric motor gear with the flywheel teeth, and sends current to the temporary electric motor, causing it to revolve the crankshaft. After the engine is running on its own power, the operator releases the starter button and the clutch pedal. The generator then acts as a generator and is driven by inclosed gears. It generates current for lighting, for ignition and for charging the storage battery, which has an 80 ampere-hour capacity.

The system also makes use of a battery of dry cells, which are used for emergency as well as for furnishing ignition current at the time of starting. They are employed because the current from the storage battery is being used to drive the electric motor when starting the engine, and if at the same time this storage battery current were required to ignite the cylinder charges, the drain would be too great and only a weak spark would be produced. After the engine is running on its own power, however, there is no longer this starting drain, and the dry cells are then not needed. The driver takes care of this by switching from the dry battery current to the generator running current after starting.

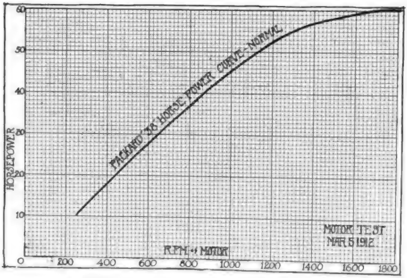
Lighting is accomplished by the use of the storage battery current when the motor is idling or not running, but when the engine has attained a speed of about 200 or more revolutions per minute, the generator furnishes the current. The ignition current for running is also supplied by the generator. Ignition is of the dual type. A single set of spark plugs is used for both this and the dry battery system. The battery and battery control device are placed on the right running board, while the generator is mounted at the rear left side of the motor—at the flywheel, necessarily.

In all other respects the new 38 adheres to the same design features as those used on the model 48 six. The constructional principle of two units is carried out, the motor and clutch forming one unit, and the rear system, consisting of gear set, final drive and differential, the other. The clutch, which is integral with the first unit is of the multiple-disk type, there being five lined driving plates and four steel-driven plates.

Power is transmitted from the motor unit to the rear axle unit by the conventional type of drive shaft. It is of large diameter and is furnished with two universal joints, one at either end. A torque arm runs parallel to the drive shaft from one unit to the other.

Like all other Packard models, the 38 gear set is bolted directly to the rear axle housing by means of an integral flange. The usual form of Packard se-

PACKARD 38 LITTLE SIX PHAETON FOR 1913



BRAKE HORSEPOWER OF PACKARD 38 MOTOR AT VARIOUS SPEEDS

lective three-speed gear set is used, the gear-shifting lever at the driver's left moving backward and forward in a single quadrant.

The rear axle is substantially housed, the tubes being of large diameter of heavy-gauge pressed steel. The housing proper is internally ribbed and is of aluminum. The front axle is of I-beam type with bowed center. The steering knuckles are provided with integrally-forged yokes, and the knuckle pin is somewhat inclined for easy steering. The steering gear embodies the worm-and-nut feature. The brakes are of the conventional internal and external expanding types. The service brakes are external contracting, while the emergency brakes expand internally. The latter are provided with bayonet locks to prevent any rattle.

The frame is of deep channel section of pressed steel. It has a kick-up over the rear axle, is narrowed in front for shorter turning radius, and extends back to protect the gasoline tank, which is also found in the rear on this new model, as well as being a feature of all other Packards this year. The location of the fuel tank here makes the use of pressure gasoline feed necessary, and a motor-operated pressure pump is employed in conjunction with a hand pressure pump on the front seat heel board for initial starting. The gasoline tank capacity is 20 gallons on all model 38 cars, and the tank pressure about 2 pounds.

Springs on model 38 are semi-elliptic in front and of standard Packard three-quarter scroll elliptic type in the rear. Their width is 2 inches all around, while the front have a length of 40 inches and the rear 51 inches.

Bodies are all distinctively Packard in appearance and show no departures from those used on the other 1913 models. Most all Packard bodies are constructed in the company's own shops and they have sheet aluminum panels over wood framework. The equipment on all bodies is most complete.

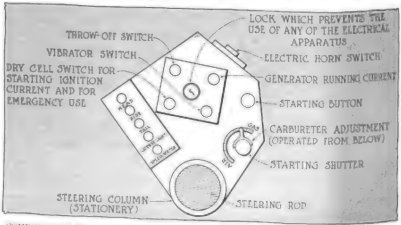
SOUTH AMERICAN FIELD

New Orleans, La., Aug. 12—European car manufacturers are securing an advantage in Latin America which is certain to cost American factories many sales. Aires and Rio de Janeiro, makers of American cars have neglected active efforts in the cities which lie south of the Rio Grande. On learning that the streets of practically all of the places were paved with cobblestones for the most part, the tendency has been to postpone any idea of propagation that may have been entertained, until better streets are constructed.

European manufacturers have adopted different tactics. They have secured high-class agents whose duty has been to stir up a desire for better streets rather than attempt to make immediate sales of cars. The Latin Americans are filled with civic pride. They have beautified their cities with magnificent buildings and monuments but they have not made smooth streets, from the fact that they were not necessary. As a general thing small cobblestones are used, which admirably resist the heavy rainfalls of that section of the world and still provide a sufficiently good surface for the coaches, the popular vehicle of this section.

Even in the United States and in France, the two countries where road building has reached the highest development, it must be admitted that the real good roads enthusiasm followed the motor car. This same principle will apply to all of Latin America, but results are certain to be quicker. In most of the capitals of the southern republics some asphalt or other smooth surfacing material has been laid. With the business in the proper hands, agents who speak Spanish and who are familiar with the demands of Spanish business methods, a few cars should be placed with the wealthier members of the community. Pride counts for a great deal in Iberian countries, and with the move once started one family is not likely to let another of its set get far ahead, and this reason is likely to be responsible for more sales than any desire for the pleasure that may come from the use of a car. Ostentation is a characteristic more deeply inbred in Latin races than in the Anglo-Saxon, and the fact that the motor car is something new and different alone will make it popular.

There are few cities in this territory, which represents more than one-fifth of the area of the globe, that have sufficient good streets to make motoring popular, but the time is ripe for improvements along this line provided the proper encouragement is offered. With cars in the possession of a few of the influential residents it is certain to be only a short time until they are anxious to lengthen their spins and to break the monotony of the limited beat they have been forced to travel.



COMBINATION ELECTRIC STARTING, LIGHTING, IGNITION AND CARBURETER CONTROLS ON THE STEERING COLUMN

Republic Single Chassis Retained for 1912

REPUBLIC FIVE-PASSENGER TOURING CAR FOR 1913 SHOWING HEAVY DASH COWL

CONTINUING the single chassis model of last year with refinements and more complete equipment, the Republic motor car for 1913, to be known as the series E, appears with four body types, a two-passenger raceabout having been added to the regular models. This body is mounted on the same chassis as the other types, with the exception of the wheels, which are of 34-inch size, and special gearing at the buyer's option.

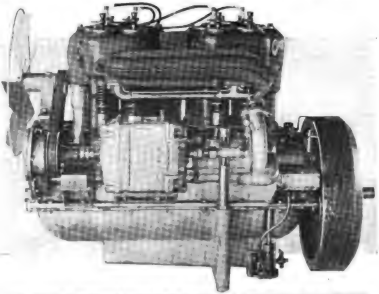
The chassis shows few mechanical changes for the new year, continuing with 120 inches wheelbase, 36 by 4-inch tires and the same long 40-inch front and 45-inch three-quarters scroll elliptic rear springs. The motor is four-cylinder, 4½ by 5, rated at 35 to 40 horsepower, of the T-head type, cast in pairs, with crankcase circulation and splash lubrication. The centrifugal type of water pump is used, a Mayo cellular radiator being used this year instead of the vertical tube type of 1912. A special Stromberg carbureter is used, with a hot air connection. The magneto formerly employed in the ignition of this car has been discarded in favor of the Delco lighting and ignition generator, which charges a set of storage batteries, from which current is taken for the lamps and for the dual ignition system, dry batteries being employed as auxiliaries.

The leather-faced cone clutch appears this year with cork inserts. The gearset, as in former models, is mounted on the rear axle, which is of the floating type. Three forward speeds are provided, with center control. The steering gear is carried on the right side, and is of the worm-and-wheel type, permitting adjustment for wear by means of four entirely separate settings. It is mounted on ball bearings, with an 18-inch hand wheel. The tie-rod is carried behind and slightly above the front axle, which is of the I-beam type, drop forged in one piece. The steering knuckles are carried on large ball bearings to facilitate ease of steering, and ball bearings are used throughout the rear axle and transmission systems, and in the front wheels.

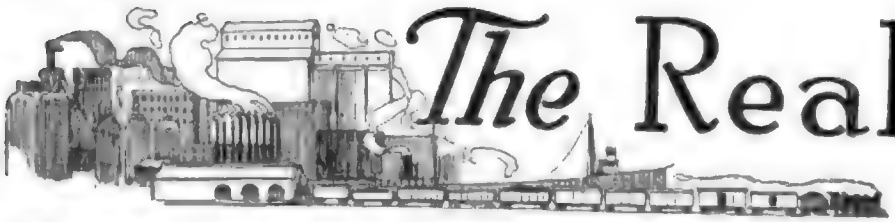
The service brakes are of the external contracting type on the rear wheels, actuated with the usual foot pedal, the emergency brake being of the internal expanding type, actuated by a hand lever at the left of the center H quadrant of the gear-shift lever. Both brakes act on 14-inch drums through equalizers. Both a torsion tube and radius rods are fitted, and all brake connections are inside the frame.

The tires are 36 by 4 inches on all wheels, being mounted on demountable rims, one spare rim being included in the regular equipment.

As in former Republic products, the car sets very low, and while of light weight, the bodies are roomy and comfortable. The touring car lines for 1913 have been simplified in the new product; the toy tonneau, which is a four-passenger car has low tilted seats, and an abundance of front leg room; and the two-passenger roadster has an exceptionally deep cowl and a long torpedo back, which carries out the popular stream-line effect admirably. This body has a trundle emergency seat folding under the front seat and pulls out over the running board.



FOUR-CYLINDER REPUBLIC MOTOR WITH LIGHTING AND IGNITION GENERATOR



The Realm of the Wheel Sizes and Motor Vehicle Wear

Discussion of the Manner in Which Hard Tires Stand Up in Commercial Vehicle Work

CURING WASTED EFFICIENCY

Artificial cooling of a gasoline motor is admittedly wasteful, inefficient, complicated and poor engineering, and yet it is allowed and used for the reason that there is no better way available. Admittedly wrong, no one has as yet invented a motor which will use up the energy now wasted in cooling the cylinders.

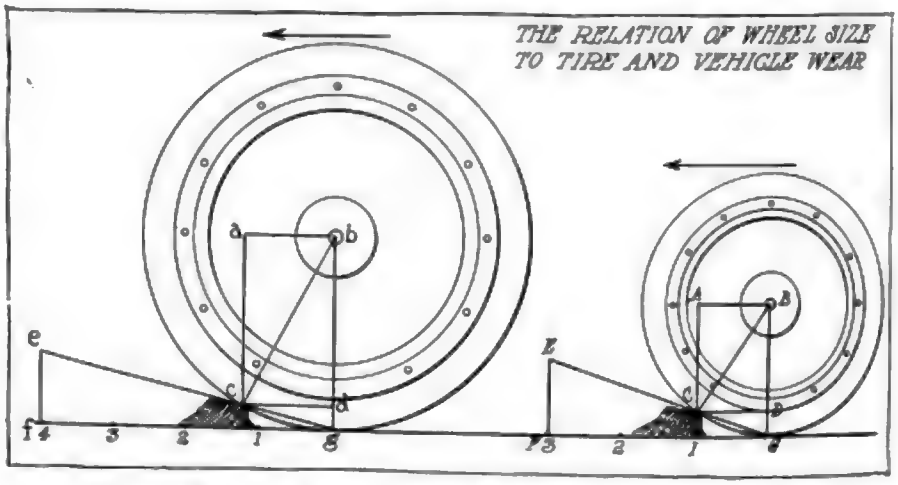
The slow delivery of goods by horse systems has been admittedly wasteful, inefficient, insanitary, and altogether inadequate by those traffic engineers who really have studied the problem, and yet this system of idle time and germ-breeding filth has been permitted for the want of a better way. Until lately no one has furnished a means of getting rid of the waste of slow delivery.

When some engineer invents a motor which will do away with the waste of cooling devices his invention will meet with an immediate reception.

Engineers already have invented and perfected a device in the motor truck which will eventually do away with the horse for city haulings, and it is here for your adoption and use to the perfection of a more efficient and health-breeding delivery system.

With its use horse systems with their great length of idle time must go and systems using every minute and second of the day possible in actual running and operating time must come with motor truck use. These systems have been perfected for certain lines and trained engineers are available to devise more methods of use to fit your own service. Road speed will be and is increased 100 per cent. The speed of the men handling the vehicles will have to increase in like ratio, men of this type being more valuable to your business and more trained in reason and business judgment for the handling of customers along the route than the type of man you hire for your horse delivery work possibly can be.

The motor truck is raising a new standard of man as well as a new standard of delivery service. These in turn decrease the waste of the distribution of goods and all working together—motor truck, handling systems, and men, we have now a cure for the wasteful inefficiency of the horse in trade and traffic.



EFFECT OF SAME IRREGULARITY ON WHEELS OF DIFFERENT SIZES

By William B. Stout

THE size of wheels fitted to motor vehicles and especially motor trucks traveling on hard tires has a direct and important relation not only to tire wear but to the wear of the whole vehicle.

A small wheel means greater road shock to tire and car and a greater liability to overload and bruising of the rubber. It means a greater number of road contacts per mile, a greater number of thrusts to rearward and greater wear in proportion. At the same time the road shocks are received more directly by the wheel which thus transmits them with less absorption to the body and machinery of the vehicle.

The drawing shows some of these points diagramatically and also why a small wheel consumes more power in meeting road obstructions than a larger wheel. At the right is shown a small wheel meeting a road obstruction in the direction of the arrow. The figure is marked with capital letters. At the left is a larger wheel, shown meeting the same obstruction from the same direction and we will say with the same speed. First look at the right hand drawing.

The point of contact of the wheel with the obstruction is marked C. The center of the wheel is at B and the line of shock to the axle as the wheel hits the bump is represented by the line C-B. The horizontal component of this shock is represented by the line A-B or by its parallel below, C-D, while the vertical or lifting component is A-C or B-D. In the drawing of the larger wheel conditions are exactly similar except that the letters are lower case instead of capitals.

It will at once be noted that the proportion of thrust necessary in the case of the small wheel to lift it over the obstruction is greater than with the large wheel. The quickest way to show this is by the method of inclines.

Take G and g as the points of contact of the wheels with the road, and C and c as the contact with the obstruction. The lines G-E and g-e passing through C and c represent the degree of incline which the wheel is climbing. Taking measurements from the figure it will be seen that the small wheel is climbing a grade of 1 in 3 while the larger wheel is only surmounting a grade of 1 in 4 over the same obstruction. Wheel diameter saves power.

At the same time it will be noted that the line C-D or c-d, as the case may be, represents a horizontal shock to the machine tending toward crystallization of parts and breakage, this line being in much greater proportion in the small wheel than in the large; in the figure 30 per cent greater. The small wheel in the proportion shown would mean a wear and tear on the motor truck 30 per cent greater than would the large wheel.

This is not the only aspect, as this greater road shock means 30 per cent more tire wear as well, irrespective of surface, though the smaller wheel has less surface of tire on the ground than the large. Again, the large wheel will make less road contacts per mile than

Commercial Car

Army Officer Designs Truck for Military

the small wheel will make, with correspondingly less wear.

A 32-inch wheel, for example, makes about 8⅓ feet per revolution or 634 revolutions to the mile. A 40-inch wheel makes 10.42 feet per revolution and does 507 turns to the mile. One hundred and thirty revolutions or road contacts are thus saved to the tire every mile. For an equal wear of tire the 40-inch wheel can go 1¼ miles to the smaller wheel's 1 mile. Again, the larger surface in contact on the larger wheel will make the percentage more than this in favor of the greater diameter. If these things be so why have not larger wheels been adopted?

The reason is mainly a manufacturing one. Small wheels and tires cost less at first. A small wheel can be made lighter for a given strength. A wheel made twice as large as present wheels for the same strength would weigh four to eight times as much. Again, truck bodies must be wide. If wheels are made high, platforms will be high or narrow or tread too broad, so there is a limit soon reached.

However, larger wheels and tires are coming. Just how much larger is yet to be seen, but the advantage of the larger wheel is not to be denied, at least so far as lessened wear and minimum of power consumed is concerned.

It is certain that the greater economy of tires and lessened strain on the vehicle which may be obtained through the use of larger wheels will result in their more general adoption in the near future.

The increased facility with which large wheels climb from depressions in the road, and the decreased shock occasioned by impact with obstructions or drops into declivities are becoming recognized.

DESIGNS for a gasoline-propelled motor truck for military service exclusively have been drawn by Major H. J. Gallagher of Seattle, and are now in the office of the war department in Washington, D. C., for consideration. Many features are included in the conveyance conceived by the Seattle army officer that recommend it strongly as a future means of transporting troops, guns and ammunition. It is superior to many models of motor trucks intended for military use in that it makes provision for carrying rifles, shells and ammunition in addition to accommodating fourteen men. Clothing and ration space also is included in the design of the car.

An interesting feature is that the construction of the machine permits all the men to mount and dismount at the same time, obviating the delay and confusion that might be experienced in the cars where a single means of access is provided.

The gasoline tank has a capacity of 50 gallons, which will give the car a traveling radius of 400 miles, while a reserve gasoline supply can be carried conveniently. A tank for drinking water for the soldiers is included in the equipment of Major Gallagher's machine. It is detachable, making it convenient to remove it in case the car is carrying excessive weight.

The speed possible for the car is estimated at 30 miles an hour. On ordinary roads it should cover 15 miles an hour, with a day's mileage of approximately 160 miles, which is equivalent to 4 days march for cavalry and at least 5 days tramp for infantry.

The cost of a car as designed is based upon an estimate of a practical motorist, the estimate being $2,000 each for cars

Major Gallagher of Seattle Sends Plans to War Department

for troops, $1,200 for a machine for officers and $1,800 for a freight truck. Assuming that a large number of cars would be purchased under contract, the cost probably would be less.

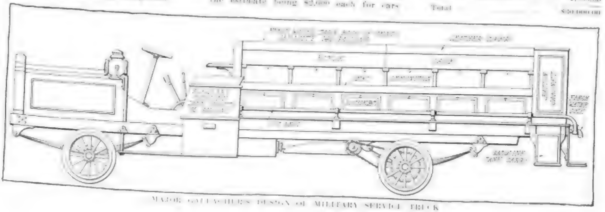
The machine is designed to carry in the lockers under the seats, which are placed back to back lengthwise, such articles and extra clothing as are now usually carried on the men's backs. There is space under the legs of the men where shelter tents and other equipment could be carried. The ration cabinet is capable of carrying 3 days' rations for the fourteen men.

One freight truck it is estimated would be sufficient for four companies in addition to the space for carrying freight on the machine. This truck would be of 6,000 pounds capacity.

As to the questions of expense and convenience, Major Gallagher has prepared figures which would make it appear that the adoption of the motor car as a means of transporting troops and ammunition would be a step toward economy, in addition to greater dispatch than is possible by horse and mule.

An estimate figured on the cost and time of transporting 140 men 100 miles by cavalry and by motor car is given herewith.

Time of marching, cavalry, 4 days	
Cost of 140 horses and equipment at $200 each	$28,000.00
Two four-mule teams, wagons and equipments	2,000.00
Total	$30,000.00



MAJOR GALLAGHER'S DESIGN OF MILITARY SERVICE TRUCK

Cost of ten motor cars at $2,000 each	20,000.00
Cost of one car for officers	1,200.00
Cost of one freight truck	1,800.00
Total	$23,000.00
Cost of gasoline, allowing 20 gallons to each machine for 100 miles, 240 gallons at 15 cents a gallon	$36.00
Cost of forage, 4 days full allowance, 12 pounds grain for each horse and 9 pounds for each mule, 14 pounds of hay for each animal; 7,152 pounds of oats at 1½ cents a pound	107.38
8,456 pounds of hay at 1 cent a pound	84.56
Total	$191.94

These figures show a saving of $7,000 on equipment while a healthy saving is noticeable in favor of the motor as against the horses and mules for good. A vital point in favor of the motor car is that there is not one cent of expense attached to it while the car is idle.

SUPPLANTS SIXTEEN MULES

Typical of southern California, and seldom if ever seen in other parts of the United States, is a five and six mule team drawing a huge tank of crude oil on the city streets and over the country roads. This method of transporting oil soon will be a relic of the past. The motor truck is fast superseding the slower and more picturesque manner of hauling, and it will be a matter of a short time when the more modern methods will have been everywhere adopted.

One of the latest concerns to dispense with mule-driven transportation system is the A. F. Gilmore Oil Co., which supplies oil for road work from its wells in the Santa Monica district. The Gilmore company has recently purchased a 5-ton Sampson truck and has fitted it with a huge tank of 1,100 gallons capacity.

The truck is making three round trips daily from the fields to the beach cities, covering a total mileage of 60 miles a day and displacing from sixteen to eighteen animals. Figuring the upkeep of the truck against the cost of feed, harness and care of the mules necessary for the same amount of work, the difference will amount to several thousands of dollars yearly in favor of the commercial car.

The Federal Motor Truck Co., after several months of earnest investigation, has perfected a motored chemical and hose truck which it is now putting on the market. The body part is mounted on a model D chassis and is completely and handily equipped with the latest and most improved fire apparatus and with side seats to accommodate eight men, besides the two operators.

The body has space for 1,000 feet of ordinary 2½-inch fire hose, some of which is on reels for quick handling. Two 25-foot extension ladders are fastened along the body sides. A 35-gallon Badger chemical tank with connections and 200 feet of ¾-inch chemical hose is neatly fitted just back of the driver's seat. Two 5-gallon hand fire extinguishers are fastened to the left-hand running-board.

Extras are fitted as follows: Two 5-foot crowbars, one Detroit door-opener, two fire axes, two 10-foot pike poles, four fire hooks.

Above the truck bed is a wire basket for holding several hundred feet of extra hose and to which the two headlights are fastened. A powerful pivot searchlight is mounted at the center of the dashboard. Two side oil lamps, as usual, are fitted. The truck is capable of a speed of 22 miles an hour on the average—twice as fast as a horse outfit, carrying at the same time more complete equipment and more men.

DISTRICT IS MOTORIZING

Motor cars are rapidly replacing horses in the municipal service of the District of Columbia. Included in the district appropriation bill just enacted by congress are appropriations for the purchase of motor vehicles for the use of the building inspector, superintendent of sewers, electrical engineer and superintendent of street cleaning. A number of other district officials already are provided with motor cars for their official duties.

Experience has demonstrated, according to district officials, that motor cars give a greater measure of service than the horse-drawn vehicles and are operated at less cost. The policy of the district commissioners is to gradually replace the horse-drawn fire apparatus with motor-propelled engines, hose wagons and trucks.

The District of Columbia at present is the owner of two pieces of motor-driven apparatus, a fire engine and a combination fire engine and hose wagon. Provision is made in the district appropriation bill for the purchase of another combination fire engine and hose wagon at a cost not to exceed $9,000. Bids for the purchase of this apparatus will be called for in the next few weeks.

LONDON TRAFFIC CENSUS

London is continuing to take census of traffic in different parts of the city at stated intervals. Motor Traction published in a July issue a general synopsis of such a census for every year since 1905, when motors first began to make their appearance on London streets. The count was taken in each case at Putney Bridge, a traffic center quite typical of London conditions. A short synopsis of the census follows:

	Motor Bus	Horse Bus	Motor Trucks	Horse Vans
1905	0	1,613	0	52
1906	805	1,222	0	59
1907	983	1,145	0	88
1908	817	1,076	0	50
1909	640	819	2	36
1910	1,009	80	3	50
1911	1,529	33	5	40
1912	1,745	10	8	47

The percentages of horse and motor bus traffic for the different years is as follows:

	Motor	Horse
1905	0	100
1906	.39	.61
1907	.46	.54
1908	.43	.57
1909	.44	.56
1910	.93	.17
1911	.98	.02
1912	.994	.006

All horse buses have now been taken off the streets of London so that next year's census will give 100 per cent motor bus traffic, just reversing the figures for 1905—a wonderful change.

One of the chief reasons for the success of the motor bus in London is the large amount of excellent pavement extending in all directions, excellently kept and ideal in surface. On these motor vehicles can operate at very low upkeep expense even on hard tires. Traffic at congested points moves much faster now that motor vehicles are so common and slow vehicles are kept strictly to the curb.

It is somewhat surprising to note the small number of motor trucks in the census, but this is due to a certain extent to the route on which the census was taken.

It is true, nevertheless, that motor trucks for London delivery have not taken near the hold that motor buses have, and probably will not for some time to come on account of traffic congestion, the slowness of British commercial methods and the lethargy which seems to descend over the average British concern and its operation when any real change in system is suggested. Present horse methods in London will not fit trucks. Hence the London firm sticks to horses.

Outside of the metropolis, however, motor vehicles are gaining rapidly and on longer hauls over the excellent country roads are in places competing directly with the railways in the handling of freight. Yet another year's census will show a considerable increase in traffic of motor trucks in London itself.

COMMERCIAL BREVITIES

Direct communication between South Bend, Ind., and Buchanan, Mich. was made possible when arrangements were completed with the Southern Michigan Railway Co. to connect with motor service at Niles, Mich. Direct connection will be made with every other train in both directions. Through tickets will be sold to all points on the northern Indiana, and southern Michigan system. The deal was made with E. B. Clark, president of the Colfor Tool Co., of Buchanan, who immediately contracted for a fifteen-passenger motor bus, which is to be delivered within a month and the service will be established immediately. A fare of 25 cents a trip will be charged between Niles and Buchanan.

A motor combination police patrol and ambulance was delivered to the Niagara Falls, N. Y. police department last week. It is a Haynes, the lower structure being built at Kokomo, Ind., while the Henry Brunn Co. of Buffalo made the body. The patrol will seat ten people and, with all accessories of an ambulance, contains first-aid paraphernalia. The roof of the new machine is mahogany while the sides and ends are of polished oak. It combines in one vehicle the functions of both a police patrol and a hospital ambulance.

Good Repairshop Ethics

THE characteristics of the workman exhibit themselves in the work he is doing. To many owners of repair shops in connection with garages, salesrooms or branch establishments the character of the man is often given little consideration providing his technical ability is such as to insure good work. This is an error. The repair shop is annually becoming a more important factor of the branch, the salesroom or the garage. Each succeeding year finds more cars in use; there are more old cars and consequently more cars to be repaired. In proportion as the number of cars increases so that importance of the repair shop grows. In this proportion must the caliber of the head workman improve in order that the general esprit de corps of the shop improves.

The repair shop does not occupy the same position to the salesroom or branch that the vault does to the safe. It is true that the lock and key are watched religiously with many, more to keep the outside world in ignorance of the nature of repairs needed on the cars and the magnitude of the work than to any desire to keep the public out. The public may not have the right to enter a repair shop but very frequently the owner whose car is undergoing repairs wishes to visit the repair shop and he has a moral right to do so. He may want to increase his knowledge of his car, and considers it the best time to do this when the car is undergoing repairs, when the parts are separated one from another and when he has a chance rarely afforded. For the repair man to forbid such visits would be disastrous. It would be the most certain way to engender distrust in the car owner's mind. If it never had entered his mind before that the repair work was other than genuine it certainly would after such a rebuff.

No; the owner has a right to see his car while it is in the repair shop and upon the general condition of the repair shop and the general demeanor of the help he will be able to carefully estimate the caliber of the work he is having done. A mussed-up repair shop indicates a poor organizer at its head; it indicates more or less carelessness and haphazardness in the work.

Contrast two repair shops, one in which there is a place for every part that has to be removed in making a car repair and another shop in which all of the parts so removed are scattered over the entire floor, under the car, at the right side, at the left side, in front and in rear. The cluttered-up condition is expensive and it destroys confidence. Where parts are left scattered on the four corners of the floor the workman consumes energy every time he has to stoop over to lay one on the floor as well as every time he stoops over to pick one up. The car owner pays for this and whenever a car owner visits a repair shop in such a condition he can at once conclude that he is paying for the cluttered up condition. His repair bill is higher because of this and it may be that the work is not so well done. An organized mind produces an organized job and the repairman who has not sufficient organization in his makeup to put all of the spare parts or tools in their proper places has rarely enough gray matter to do the job in the best way or with the greatest accuracy.

Consider for a moment the loss of time due to laying parts of a car on a dirty floor instead of placing them high and dry on a work bench. A part lying on the floor gets covered with dirt. This must be cleaned off before it can be replaced. To clean it may require a can of gasoline. In the modern repair shop the use of gasoline freely in the shop is not permitted; rather it is restricted to what is known as a gasoline room, this precaution being taken to guard against fire. This means perhaps several trips to clean with gasoline parts that never should have been dirtied. This adds to the repair bill and the owner pays for it. The repair shop owner also pays for it but not to so great an extent. There are scores of cases on record where small parts have been lost, due to promiscuous scattering of them on the floor and where they have not been lost they have been damaged and in some cases broken by being tramped upon or by laying other pieces on them.

In some of the European motor car repair departments the workmen are required to wear long white dusters, the garment being worn not primarily with the object to keep the workman's clothes clean but rather impressing on him the necessity of cleanliness and tidiness. The white garment produces a moral effect; it is a silent assistant, every moment suggesting to him the clean job, the clean shop and consequently the clean repair. Every factor of that nature is a good investment. In a large American car builder's branch repair shops cuspidors have been provided for every workman, special toilet facilities have been furnished and every factor used which will have an upward tendency on the repairman.

It will pay every dealer, branch manager or garage man to raise the level of the repair department, to make it a center of cleanliness, which it should be, instead of its being the opposite. The owner will discover that better workmanship will result from such a regime, that more accurate work will result and that the efficiency of the man will be higher. He will further discover that the general expenses of the department will be reduced. There will not be so much material lost or wasted, there will not be so many heavy overhead costs, the tools will not be so abused, and in general there will be an unlooked for improvement in the general standard of the work.

But the good will not end here. The visitor will see the work and be impressed with the conditions. He will be a better customer; he will feel that he is getting more judicious service, that the work is being better done; that the parts of his car are not being lost and inferior ones put in their place; that he is not being charged for ignorant, mis-directed energy, and in fact he will feel as every other person feels when entering a well-organized shop or business house, namely, that whatever he has done or purchases will but reflect the general conditions everywhere apparent.

Repairing Honeycomb Radiators

It sometimes happens that owing to some accident or to a fault in the process of manufacture, one or two of the cells or tubes of a cellular or honeycomb radiator may spring a leak. In such cases a quick and effective repair may be made by plugging up the ends of the cells or tubes themselves with soft lead or a piece of wood whittled or cut so as to fit snugly into the ends of the cells. When plugs are used they should be driven in from the front and back of the radiator and the cut off and carefully hammered flush with the surface; or if convenient have a tinsmith solder around the edges of the lead plugs. Unless an expert one should not attempt to solder a radiator, for one is very apt to open up a few of the surrounding cells and cause more harm than good

Radiator leaks are hard to find usually. They may be often detected by steam issuing from them, but if this is not the case, and the exact spot from which the water is escaping cannot be readily determined, the best thing to do is to remove the radiator. Plug up all the openings, such as inlet and outlet, except one, with corks or wooden plugs. Then into the opening which still remains open, place a plug through which the tube of a tire pump passes. Place the radiator in a tub of water and pump air into it by means of the tire pump. Bubbles will issue from the leak or leaks, which should be immediately marked with chalk so as to be easily located later when the radiator is removed from the tub.

From the Four Winds

ROCHESTER'S Orphans' Day—Orphans' day in Rochester, N. Y., was a great success, 762 orphans being driven in 284 cars to Ontario Beach park where the parentless children had access to every amusement on the grounds.

Prepare a Glidden Welcome—There is no abatement in the interest in New Orleans with which the pathfinders for the A. A. A. reliability tour is being watched. The list of entries to participate in the trip out from the city to meet the pathfinder is growing daily. More than 300 cars are pledged already for the welcoming trip.

Governor Dix Kicks—Owing to complaint of Governor Dix of New York state, to the highway commissioner, men will be stationed at either end of a stretch of road which is undergoing repairs. The complaint resulted from trouble the state executive had on a recent motor trip through New York. On one stretch he motored several hundred yards when he encountered workmen who had the remaining portion of the road torn up. The governor then had to turn back to take another road.

Indianapolis Posting Signs—An extensive road-posting campaign has been started in Indiana by the Hoosier Motor Club, of Indianapolis, and all of the principal highways out of that city for a distance of several miles are being provided with guide signs. Motor car manufacturers of the city are assisting by loaning test cars on certain days. At the city limits special signs are being posted telling to what cities the roads lead. The ordinary sign, telling the route to Indianapolis, is a white stripe on every tenth telephone or telegraph pole. Dangerous places are being indicated by two white stripes, each 6 inches wide.

Car Collides with Steamer—A head-on collision of a large touring car with a steamboat that was approaching to anchor at the wharf on the Arkansas river at Little Rock, established a precedent, of anything of that kind in automobile circles in this state. The steamer Grand, of Memphis, had just arrived from a trip to points up the river loaded with excursionists and was slowly swinging into the wharf to deposit its load of passengers, when the touring car came around the corner of the street that turned down the wharf and glided swiftly down the inclined slope to the water. As the car neared the steamer the chauffeur made an effort to apply the brakes, but they failed to respond and the car dashed into the water and ploughed its way to the bow of the huge steamer. Blocks and tackles were procured and the car was drawn with its load of moistened occupants back upon dry land, while the steamer slowly slid into the dock and deposited its load as if nothing had happened.

New Indiana Club—The Newport Motor Club, of Newport, Ind., has been incorporated, receiving a charter under the voluntary association act of that state covering associations which have no capital stock. The directors named in the charter are James Barker, I. M. Casebeer and J. H. Groves.

Another Minnesota Club—One hundred motorists of Hastings, Minn., have organized a club to improve roads and promote sociability tours over these roads. Officers are: President, Captain E. C. Anthony; vice-president, A. M. Adsit; secretary, A. N. Gergan; treasurer, John Heinen.

Clubhouse on Mountain—Alabama capitalists have taken over 253 acres of land on the top of Lookout Mountain and will establish a motor club. A speedway will be laid out at once and a clubhouse built. This is expected to become one of the meccas of the motor tourists of the north and south. Louis Hart, of Gadsden, Ala., is the moving spirit in the enterprise.

Ohio Road Work—According to a recent report of the Ohio state highway commission, there is 72 miles of roadway under construction by the state. The 72 miles of roadway is located in thirty-one counties and will be completed by September 15 at a cost of $659,930. August 22 the state highway commission will award contracts for the improvement of $170,000 worth of roads located in many sections of the state.

Canadians Elect—At the annual meeting of the New Brunswick Automobile Association T. P. Regan was elected president and W. C. Cross vice-president. The election of the secretary was laid over until the arrival of the president, who is now in New York. The board of governors was appointed as follows: J. Fraser Gregory, Dr. G. A. B. Addy, J. Royden Thompson, R. D. Patterson, Fred McGee, of Elgin; F. A. Sumner, Moncton, and George W. Fowler, of Sussex.

Penn Orders 1913 Tags—Dark olive green for a background, with letters in white, is the color combination decided upon for Pennsylvania motor tags for next year by State Highway Commissioner Edward M. Bigelow. Bids for 75,000 license plates will be asked for. These are to be furnished by November 1, 1912. The announcement that next year's tags must be furnished by November 1 is an innovation, the date being set considerably earlier than in previous years. This is due to the fact that for weeks before the close of the year the department gets hundreds of applications for tags for the coming year.

Minnesota Registrations—For the first 6 months of 1912 the registration of motor cars with the secretary of state at St. Paul, Minn., reached 26,000, 4,000 motorcycles, 3,000 chauffeurs and 243 dealers, with receipts of $55,000.

Wants Senator to Contribute—The Kenosha Automobile Club, of Kenosha, Wis., has asked United States Senator Isaac Stephenson, the millionaire junior senator from Wisconsin, to renew his offer, made in 1902, that he will give $10,000 for highway construction in Kenosha county if the county will duplicate the amount. The senator owns an immense stock farm near Kenosha. The club proposes to raise $5,000 if the county will appropriate an equal amount in case the senator renews the offer.

To Post Minnesota Road—Road signs similar to those used by the Automobile Club of Minneapolis are being built under the supervision of the road signs committee of the club to be placed along the 228-mile road between Minneapolis and Watertown, S. D. One-fourth of the cost of a sign for every 4 miles is to be paid by the club and the rest by other towns on the road. The highway is the Minneapolis connection with the Meridian road. To celebrate the opening of the road Watertown is organizing a run to Minneapolis with about 150 participants.

Bison's Country Home—The Automobile Club of Buffalo's country clubhouse at Clarence, N. Y., which was constructed at a cost totalling $75,000, is said to be the finest country home owned by any motor organization in the United States. The estate on which the clubhouse is located comprises 70 acres on which are stately pine and hickory trees as well as apple trees and shrubbery. The clubhouse is approached from the main highway by broad, smooth road leading directly to arched driveway. The building itself, which is 200 feet long by 136 feet at greatest width, is of mission architecture and represents a spacious bungalow. The general reception room on the first floor has seating capacity for 500 people. This room is finished in weathered oak, unpolished, with vaulted ceilings and five fireplaces of red brick to hold large logs. On the second floor also is a large, comfortable smoking room. The dining service at the clubhouse consists of eight private dining rooms. The entire structure is encircled with broad verandas, 14 feet in width. On the concrete terrace adjoining the south side of the clubhouse is an additional seating capacity for at least 500 people. The lawns surrounding

the country home are converted into tennis courts, golf links and general recreation grounds. From the verandas can be seen a small lake which is about 100 feet distant.

Testing Truck Tax Law—License Inspector A. B. Gray has begun a test of the Minneapolis ordinance requiring a tax of $1 for each motor truck used for hire. Several chauffeurs have been arrested on the charge of not having paid the tax, and trials are set for future dates.

Louisiana After Money—The Louisiana tax commission has recommended a state tax on motor cars in addition to the $5 yearly tax that it is allowed municipalities to assess. The amount of the tax probably will be left to the legislator who may present the bill covering the question.

Albuquerque Building Speedway—A 20-mile motor speedway is being constructed on the mesa 10 miles east of Albuquerque, N. M. The whole circuit, as well as the city and valley below, can be seen from one point at the foot of the Sandia mountains. A 25-horsepower steam roller precedes the Dillon motor road drag. In the rear of the drag is hitched a heavy wagon with 6-inch tires, which packs down the tracks made by the two points of the drag, producing an ideal road.

Clear Salamanca—A committee composed of Harry Thorp Vars, and Dai H. Lewis, president and secretary, respectively, of the Automobile Club of Buffalo, N. Y., and O. E. Yeager, president of the Victor Motor Truck Co., Buffalo, recently investigated the so-called speed-trap conditions at Salamanca, N. Y., and the result of their inspection is a vindication for the Salamanca Automobile Club. The Buffalo committee ascertained that certain motorists had been arrested and fined for violating the ordinance but that no speed trap exists at that town. About a year ago the town filed with the secretary of state a copy of an ordinance limiting speed to 15 miles an hour, but it has been lenient until recently when two serious accidents occurred, this leading to a revival of the strict ordinance.

NEW COUNTRY HOME OF AUTOMOBILE CLUB OF BUFFALO

Grand Rapids Wants Wheel Tax—Because the use of motor-driven apparatus has increased the repair cost of the streets, a wheel tax is proposed for Grand Rapids, Mich., if an ordinance to provide for such legally can be passed.

Cars Hurt Railroad Traffic—Agents of the Wabash railroad say that the growing number of motor cars is affecting the passenger revenue of the railroads. On a central Illinois branch into Champaign the ticket sales have declined 50 per cent during the past year or two.

Up to the Dealers—The question whether the Automobile Club of Washington is to have a reliability tour will be settled by the dealers. Rudolph Jose, captain of the club, intends to call a meeting of the dealers about Aug. 19 to vote on the proposition. A 3-days' run was scheduled for June, but owing to a lack of entries it was postponed until September. As the dealers are the only people interested in contests in this section, it is the intention of the club to put the matter squarely up to them. If the dealers vote to hold the run the club will promote it.

Schenectady Awakens—For the first time in 5 years the Schenectady Automobile Club held a meeting in Schenectady, N. Y., last week at which officers for the ensuing year were elected. Those chosen were: President, Charles H. Benedict; treasurer, James W. Yelverton; secretary, Benjamin A. Burtiss; assistant secretary, W. J. Fallon. The meeting was held at Hotel Edison, where it was decided to open headquarters for the local organization. Assistant Secretary Fallon was appointed manager of the touring bureau to be opened in a few days. A membership campaign is to be conducted. Every road in Schenectady county is to be labeled with handsome enameled signs, costing $1.25 each. The sum of $350 in the organization's treasury has been appropriated for this purpose.

Motor Firemen Win Cup—For having in line at the parade at Rochester, N. Y., of the Western New York Volunteer Firemen's Association the finest motor fire apparatus of the numerous hose companies from that section, the Dye Hose Co., of Albion, N. Y., was awarded first prize. The apparatus that took first honors is the Thomas-Victor combination chemical and hose wagon.

Western Road Boomers Busy—The third of the good roads boosting trips of the Omaha Commercial Club came to an end, when the car driven by H. E. Frederickson, chairman of the club's county road committee, reached Salt Lake, early last week. It was announced at the banquet given at Salt Lake to the party, that members of the Salt Lake City Commercial Club would go in a car, on to the coast. Further it was voted to name the route the Omaha-Salt Lake pioneer trail.

Motorist Drives Hogs—It is necessary to get out into the rural districts to learn the real utility of a motor car. That the car of modern make is good for almost anything was demonstrated when Mark Howell, a farmer of near Ipava, drove a bunch of thirty-eight hogs to town, herding them in his car and as successfully as by the old method of following on horseback or in a wagon. On the way one of the fattest of the porkers played out and was unable to walk any farther. Howell, with the aid of a neighboring farmer, lifted the weary one into the car and hauled it to town.

Politician's Motor Expense—In a sworn statement filed with the county clerk of Harris county, Texas, as required by law, Jake F. Wolters, who was defeated in the recent Democratic primaries for endorsement by that party for United States senator, makes the declaration that during the campaign just closed he traveled 16,300 miles in Texas in a motor car owned by himself at a cost of $856.65. This includes the cost of gasoline, garage charges, repairs and other incidental expenses of the remarkable canvass. It represents an outlay of a trifle more than 5 cents per mile for the 16,300 miles. The motor car trip occupied about 4 months.

Find Good Sand for Roads—Local, state and government officials are making exhaustive tests of a peculiar sand formation in the vicinity of Waupaca, Wis., which is said to be particularly good for use in laying concrete roads. The material is a torpedo sand, which when screened is said to be better than the finest sands yet encountered in the middle west for this work. The 2 miles of concrete road built by Winnebago county into the city of Neenah, and the 4 miles between Fond du Lac and Oshkosh, Wis., contain this sand and the surface of the pavement is claimed to be smoother and hold better wearing qualities than any other pavement of this type.

Current Motor Car Patents

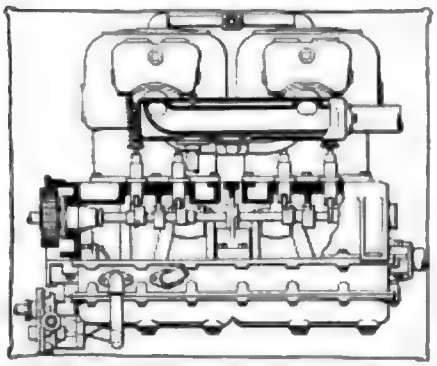


FIG. 1—PACKARD COOLING SYSTEM

PATENTS ISSUED AUGUST 6, 1912

1,034,414—Wheel. Thomas G. Briggs, Lexington, N. C. Filed May 19, 1911. Serial No. 628,311.

1,034,423—Vehicle Top Raiser. George W. Christopher, Elizabeth, N. J., and William Chas. L. Evans, New York, N. Y. Filed December 20, 1911. Serial No. 666,879.

1,034,438—Spring Wheel. William L. Fulton, Jr., Savannah, Ga. Filed July 28, 1911. Serial No. 641,064.

1,034,451—Rotary Gasoline Engine. Henry Hendricks, Alton, Ill., assignor of one-half to Fred R. Hendricks, Alton, Ill. Filed April 22, 1911. Serial No. 622,666.

1,034,453—Clutch. Lindley D. Hubbell, Hartford, Conn., assignor to the Pope Manufacturing Co., Hartford, Conn., a corporation of Connecticut. Filed July 24, 1906. Serial No. 327,571.

1,034,464—Motor Car. Harold H. Kennecy, Indianapolis, Ind., assignor to the Waverley Co., Indianapolis, Ind., a corporation of Indiana. Filed June 19, 1911. Serial No. 634,-101.

1,034,468—Tire for Motor Car Wheels. Heinrech Knoch, Adlershof, near Berlin, Germany. Filed March 4, 1911. Serial No. 612,298.

1,034,475—Resilient Vehicle Wheel. Marius Mathiesen, San Antonio, Tex. Filed March 19, 1912. Serial No. 684,705.

1,034,497—Elastic Suspension Device for Motor Cars. Francesco Pagliano, Turin, Italy. Filed November 23, 1910. Serial No. 593,833.

1,034,500—Universal Joint. Karl F. Ranger, Battle Creek, Mich. Filed May 21, 1909. Serial No. 497,394.

1,034,514—Clutch. John James Rufe, Doylestown, Pa. Filed September 6, 1911. Serial No. 647,803.

1,034,524—Spring Wheel. Charl Sjogren, Wessington Springs, S. D. Filed April 10, 1912. Serial No. 689,840.

1,034,530—Signal Horn. Ira E. Stump, Cleveland, Ohio, assignor to Hugh Pease, Lakewood, Ohio. Filed May 18, 1911. Serial No. 627,963.

1,034,531—Signal Horn. Ira E. Stump, Cleveland, Ohio, assignor to Hugh Pease, Cleveland, Ohio. Filed August 12, 1911. Serial No. 643,687.

1,034,534—Shield for Automobiles. Almer B. Thomas, Hardwick, Vt. Filed December 14, 1910. Serial No. 597,290.

1,034,536—Lamp. Francis H. Tobias, New York, N. Y. Filed October 23, 1911. Serial No. 656,086.

1,034,543—Starting Crank for Hydrocarbon Engines. Alex M. Walstrom, Minneapolis, Minn. Filed August 31, 1911. Serial No. 647,-110.

1,034,549—Gas Engine. Charles White, Baltimore, Md. Filed September 27, 1911. Serial No. 651,003.

1,034,550—Steering Device for Traction Engines. Charles S. Whitworth, Cedar Fall, Iowa. Filed November 2, 1911. Serial No. 658,109.

1,034,551—Vehicle Spring. Charles H. Wilcken, Monarch, Wyo. Filed July 14, 1911. Serial No. 638,530.

1,034,559—Starting Device for Internal Combustion Engines. Charles G. Adsit, Detroit, Mich., assignor of one-fifth to Sidney B. Winn, one-fifth to George H. Brown, one-fifth to Charles H. Land, Jr., and one-fifth to Nathan H. Jewett, Detroit, Mich. Filed June 2, 1911. Serial No. 630,863.

1,034,561—Electric Distribution System. Vincent G. Apple, Dayton, Ohio. Filed April 23, 1906. Serial No. 313,270.

1,034,562—Lamp. Vincent G. Apple, Dayton, Ohio. Filed July 10, 1911. Serial No. 637,670.

1,034,579—Brake. Alanson P. Brush, Detroit, Mich., and Walter C. Baker, Lakewood, Ohio. Filed September 17, 1908. Serial No. 453,421.

1,034,583—Induction Coil. John F. Cavanagh, Providence, R. I., assignor of three-fourths to Lindsley & Allen Electric Co., Providence, R. I., a corporation of Rhode Island. Filed April 19, 1909. Serial No. 490,-721.

1,034,596—Electric Switch. Paul Druseidt, Remscheid, Germany. Filed December 30, 1911. Serial No. 668,604.

1,034,612—Lubricator. Max Glass, Vienna, Austria-Hungary. Filed October 14, 1911. Serial No. 654,604.

1,034,634—Shock Absorber. George Cushing Martin, Los Angeles, Cal. Filed July 7, 1909. Serial No. 506,407.

1,034,635—Motor Car Extricator. Henry S. McCall, Ogeechee, Ga. Filed February 20, 1912. Serial No. 678,821.

1,034,645—Electric Ignition Device. Henry Joseph Podlesak, Chicago, Ill. Filed March 25,1910. Serial No. 551,546.

1,034,673—Gas Engine. Baxter M. Aslakson, Salem, Ohio. Filed January 12, 1910. Serial No. 537,616.

1,034,679—Wind Shield. Edward J. Beseman and Frederick Nichols, Los Angeles, Cal.; said Nichols assignor to said Beseman. Filed June 19, 1911. Serial No. 634,134.

1,034,682—Rotary Engine. William C. Bosley, Houston, Tex. Filed February 3, 1910. Serial No. 541,755.

1,034,686—Headlight. Frank Buchanan, Dayton, Ohio. Filed February 26, 1907. Serial No. 359,476.

1,034,694—Clutch. Kenneth Crittenden, Detroit, Mich. Filed July 12, 1910. Serial No. 571,549.

1,034,707—Valve for Internal Combustion Engines. William Henry, Philadelphia, Pa. Filed June 7, 1905. Serial No. 264,161.

1,034,708—Valve for Internal Combustion Engine. William Henry, Philadelphia, Pa. Filed September 18, 1907. Serial No. 393,474.

1,034,720—Spring Cushion Tire. Neill McQueen, Ludowici, Ga. Filed December 14, 1910. Serial No. 597,384.

1,034,728—Water Cooling System for Hydro Carbon Engines. James Ward Packard, Lakewood, N. Y., assignor, by mesne assignments, to Packard Motor Car Co., Detroit, Mich., a corporation of Michigan. Filed October 23, 1906. Serial No. 340,238.

1,034,732—Engine. James H. Pierce, Bay City, Mich., assignor of one-half to James H. Budd, Wilmington, Del. Filed September 18, 1911. Serial No. 649,811.

1,034,733—Keyless Motor Car Clock. James R. Putnam, Waterbury, Conn., assignor to Waterbury Clock Co., Waterbury, Conn., a corporation. Filed January 9, 1912. Serial No. 670,173.

1,034,736—Spring Wheel. Herschel A. Schermerhorn, Shabbona Grove, Ill. Filed January 25, 1912. Serial No. 673,336.

1,034,739—Fluid Clutch. Alvin H. Shoemaker, Portland, Ore., assignor of two-thirds to Albert Cleveland and E. A. Tyroll and one-third to J. W. Hurley, Portland, Ore. Filed September 11, 1911. Serial No. 648,811.

1,034,740—Fluid Clutch. Alvin H. Shoemaker, Portland, Ore., assignor of two-thirds to Albert Cleveland and E. A. Tyroll and one-third to J. W. Hurley, Portland, Ore. Filed December 12, 1911. Serial No. 665,398.

1,034,748—Pneumatic Tire. Smile Well, New Orleans, Pa. Filed May 22, 1911. Serial No. 628,808.

1,034,769—Motor Vehicle. Charles E. Duryea, Reading, Pa. Filed September 17, 1908. Serial No. 453,501.

1,034,778—Starting Device for Explosive Engines. William J. Foster, New York, N. Y. Filed February 25, 1911. Serial No. 610,672.

1,034,814—Rim Structure. Neill McQueen, Ludiwici, Ga. Original application filed November 3, 1910. Serial No. 585,150. Divided and this application filed December 17, 1910. Serial No. 597,969. Renewed July 3, 1912. Serial No. 707,611.

1,034,835—Sparking Mechanism for Internal Combustion Engines. Lewis T. Rhoades, Mont Clare, Pa. Filed March 15, 1911. Serial No. 614,579.

1,034,845—Clutch. Cecil Hamelin Taylor and Howard E. Coffin, Detroit, Mich., assignors to Hudson Motor Car Co., Detroit, Mich., a corporation of Michigan. Filed August 22, 1910. Serial No. 578,428.

1,034,847—Vehicle Wheel. Paul Isidore Viel, Paris, France. Filed November 7, 1910. Serial No. 590,992.

1,034,871—Power Transmission Gearing. Leon J. Campbell, Chicago, Ill., assignor to James T. Healy, trustee, Chicago, Ill. Filed April 27, 1912. Serial No. 693,550.

1,034,873—Headlight. William Churchill, Corning, N. Y. Filed November 25, 1910. Serial No. 594,015.

1,034,874—Device for Removing Valve Springs. George F. Clark, Daytona Beach, Fla. Filed January 31, 1912. Serial No. 674,-495.

1,034,877—Rotary Valve for Explosion Engines. Howard E. Coffin and Guido G. Behn, Detroit, Mich., assignors, by mesne assignments, to the Reynolds Motor Co., Detroit, Mich., a corporation of Michigan. Filed June 27, 1910. Serial No. 569,064.

1,034,899—Folding Top for Vehicles. Traugott Golde, Gera, Germany. Filed February 27, 1911. Serial No. 611,022.

1,034,900—Vehicle Hood. Traugott Golde, Gera, Germany. Filed August 3, 1911. Serial No. 642,120.

1,034,901—Vehicle Hood. Traugott Golde, Gera, Germany. Filed August 4, 1911. Serial No. 642,255.

1,034,902—Hinged Vehicle Hood. Traugott Golde, Gera, Germany. Filed August 4, 1911. Serial No. 642,256.

1,034,903—Hinged Vehicle Hood. Traugott Golde, Gera, Germany. Filed August 8, 1911. Serial No. 642,920.

1,034,904—Hinged Vehicle Hood. Traugott Golde, Gera, Germany. Filed December 26, 1911. Serial No. 667,578.

1,034,905—Hinged Vehicle Hood. Traugott Golde, Passaic, N. J. Filed February 15, 1912. Serial No. 677,709.

1,034,906—Hinged Vehicle Hood. Traugott Golde, Passaic, N. J. Filed February 15, 1912. Serial No. 677,710.

1,034,907—Traction Machine. Sidney A. Grant and Lewis C. Grant, Thompsonville, Conn. Filed October 20, 1911. Serial No. 655,722.

1,034,942—Resilient Metal Tire for Vehicle Wheels. Frank W. Wieber, Colorado Springs, Colo.; Charles J. Wieber, executor of said Frank W. Wieber, deceased. Filed April 17, 1911. Serial No. 621,680.

1,034,956—Four Wheel Drive. Erick P. Bergman and Hal Clarke, Cherokee, Okla., assignors of one-eighth to Sydney R. Roth, Cherokee, Okla., and one-eighth to Russell N. McConnell, Oklahoma, Okla. Filed May 10, 1911. Serial No. 626,269.

1,034,966—Tire. Herman A. Brandenburger, St. Louis, Mo. Filed July 24, 1911. Serial No. 640,296.

1,034,975—Resilient Wheel. Zehner D. Butts, Cleveland, Ohio. Filed September 21, 1911. Serial No. 650,658.

1,034,980—Spring Wheel. John F. Cocowitch, Dunnellon, Fla., assignor of one-half to James G. Baskin, Dunnellon, Fla. Filed September 21, 1910. Serial No. 583,054.

1,035,004—Vehicle Wheel. Thomas Arthur Hargraves and Edward James McCord, Belfast, Ireland, assignors of one-third to Thomas Sterling, Belfast, Ireland. Filed August 5, 1911. Serial No. 642,503.

1,035,040—Change Speed Gear. Charles J. Paulson, Brooklyn, N. Y., assignor to Albert J. Nothaker, Brooklyn, N. Y. Filed February 8, 1912. Serial No. 676,216.

1,035,048—Automobile Trunk. James M. Pritchett, Vincennes, Ind., assignor of one-half to James V. Smith, Vincennes, Ind. Filed December 2, 1911. Serial No. 663,492.

1,035,052—Spring Tire. Charles P. Roster, Boulder, Colo. Filed July 22, 1911. Serial No. 639,906.

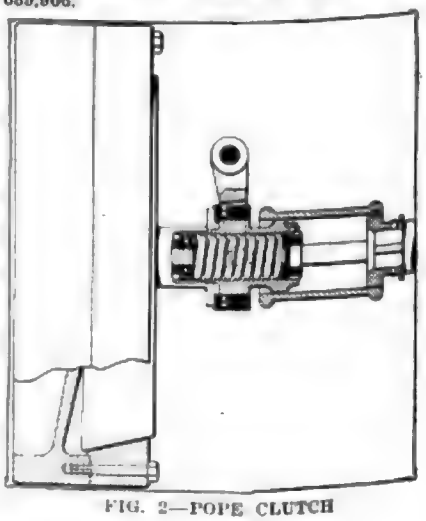


FIG. 2—POPE CLUTCH

1,035,058—Spring Wheel for Motor Cars and Other Vehicles. Winston Stephens, New Bedford, Mass., and Horace M. Gaston, Newport, R. I. Filed November 2, 1910. Serial No. 590,388.

1,035,076—Variable Speed Gearing. Creed Haymond Boucher, U. S. Navy. Filed December 8, 1911. Serial No. 664,638.

1,035,078—Resilient Tire for Vehicle Wheels. William W. Broga, Springfield, Mass. Filed February 1, 1910. Serial No. 541,234.

1,035,085—Speed Indicator. Victor L. Cross, Plattsburg, N. Y. Filed May 23, 1910. Serial No. 562,931.

1,035,091—Starter for Motor Car Engines. George Hartwell Kelley, Gainesville, Fla. Filed July 21, 1911. Serial No. 639,816.

1,035,112—Traction Wheel. James Beard, Veterans' Home, Cal. Filed April 29, 1911. Serial No. 624,010.

1,035,128—Cushion Tire for Wheels. Neill McQueen, Ludowici, Ga. Filed October 3, 1910. Serial No. 585,150.

Clutch No. 1,034,453—Lindley D. Hubbel, Hartford, Conn., assignor to the Pope Mfg. Co., Hartford, Conn. Filed, July 24, 1906, dated August 6, 1912. Of the inverted cone type, this clutch consists of a flywheel, composed of two transverse sections, the forward section of which is secured to the driving shaft, the rear section being bolted to the front section. The interior surface of the rear or clutch section is beveled inversely, at a bevel to correspond with the bevel of a cone disposed within the wheel, and bearing, when engaged, upon the inverse bevel of the clutch member of the wheel. Terminating in a sleeve, this inner cone is adapted to slide into and out of such engagement as directed by the position of an annular ball thrust bearing, controlled by suitable connections, which seats against a collar on the sleeve. This sleeve extends rearward, telescoping within a hollow cylinder secured to the driven shaft. Within this sleeve is a coil spring which is seated at its rear end against an integral attachment to the sleeve, and at its forward end against a ball thrust bearing secured to a rod, disposed within the spring and secured to the driven shaft in such a way that the tension of the spring exerts a pressure on the sleeve and cone adapted to engage the latter with the bevel on the wheel. This clutch is shown in Fig. 2.

It is especially noteworthy in that it is of extreme simplicity and of liberal size. As is the case with this type, the control is simple and direct.

Packard Cooling System, No. 1,034,728—James Ward Packard, Lakewood, N. Y., assignor, by mesne assignments, to Packard Motor Car Co., Detroit, Mich. Filed October 23, 1906, dated, August 6, 1912. Relating to a water cooling system, this patent applies to a circulation of water about the engine bearings, and about the exhaust manifold. The order of circulation is from the cylinder jackets through the exhaust manifold jacket, to the bearing passages, and out through concealed passages in the crankcase to the radiator. The object of this arrangement is twofold. The circulation of water about the bearings is for the purpose of keeping them cool, while the manifold is water jacketed for the same reason, and to maintain the water at a warm temperature in weather when it would otherwise freeze. This construction furthermore would exert a tendency towards preventing muffler explosions, through cooling the exhaust. A feature of distinct novelty, set forth in the claims, consists of a valve, which directs the water from the cylinder jacket into the exhaust passage itself, and another valve to admit water from the exhaust jacket into the exhaust passage direct. This system has not yet been applied to the Packard motor. It is shown in Fig. 1.

Clutch, No. 1,034,845—Cecil Hamelin Taylor and Howard E. Coffin, Detroit, Mich., assignors to the Hudson Motor Car Co., Detroit, Mich. Filed August 22, 1910, dated August 6, 1912. Of the multiple disk type, this clutch consists of three shafts, a driving shaft, a driven shaft, and an intermediate shaft. The latter telescopes with each of the former, being loose on the first, and in telescopic engagement with the latter. Within the former at the end of the intermediate shaft is a coil spring which bears against the end of the latter. Mounted upon the intermediate shaft is a clutch assembly consisting of a plurality of disks engaging by means of inner lugs with corresponding axial grooves in the inner clutch drum, which is secured to the intermediate shaft.

Alternating with these disks is a series of approximately the same number of disks of substantially the same size, but with lugs on their exterior edges, engaging with the exterior case of the assembly by means of a series of bolts, which serve to secure the back plate of the assembly to the main housing, making it substantially oil-tight. Connecting with the inner drum is a sliding engagement collar adapted to control for the purpose of allowing the disks to come into contact, or to separate them. Contact is secured by means of the spring disposed within the hollow recess of the driving shaft, which bears on the end of the supplementary clutch shaft through a ball thrust bearing. It is shown in Fig. 3.

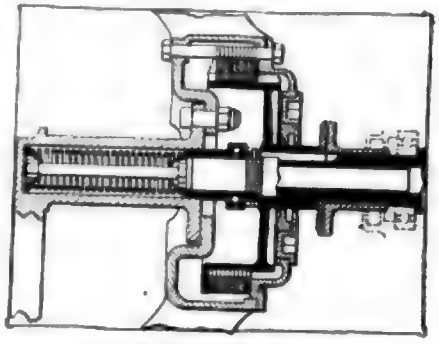
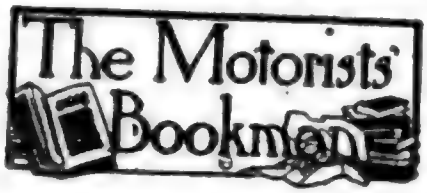


FIG. 3—HUDSON CLUTCH



Manual for Body Draughtsmen

MOTOR car body draughtsmen are confronted with problems and perplexities that are to a certain degree peculiar to their calling. The development of the motor car has brought forth features of design in coachwork, etc., that require special handling, and to the end of assisting those employed in this work to more easily compass its difficulties by a thorough knowledge of the practical application of its underlying principles, as well as to assist ambitious shop mechanics in acquiring the training necessary to better their positions, R. B. Birge and Hugh M. Sargent, have prepared a manual on this subject. They are experts in this class of work, and have had extensive experience in its instruction. A thorough groundwork of definitions and terms of plane geometery in its application to vehicle design is given, and a number of useful draughting-room kinks, to prepare the reader for the practical work of laying out projections in design. The principle, construction and projection of joints, miters, dihedral angles, etc., is next fully explained, before entering into actual examples of design. Much space is devoted to elements of design and projection of motor car coachwork, mudguards, dashes, etc., illustrated with complete and partial designs prepared by the authors. A quick and simple method of perspective drawing of vehicles is given and illustrated, that should clear up a difficult problem for many draughtsmen. Further discussion is given to colored drawings of motor cars, and miscellaneous problems such as glass framing, the framing of doors, and the making of working draughts.

Ware Brothers, Philadelphia, are the publishers. The book is bound in strong red cloth, 9½ by 12 inches, and printed on good quality glazed paper, being well within the reach of any, at the price of $2 net.

Penal Servitude

In connection with the good roads movement, "Penal Servitude," by E. Stagg Whitin, should prove of value to students of its problems. Professor Whitin is general secretary of the national committee on prison labor, and speaks with unquestioned authority. The volume deals scientifically with the problem in all its aspects, and it is appendixed with a digest of the platforms of political parties, the opinions of twenty-eight state governors, as expressed in their messages, miscellaneous reports and the laws of all the states, in their bearing on penal servitude. The work is published by the National Committee on Prison Labor of New York, and contains 162 pages of interesting and authoritative matter, well illustrated with half-tones and diagrams.

Among the Makers

CONSIDERING Moving—The Muskegon Piston Ring Co., now manufacturing motor specialties at Muskegon, Mich., is considering the removal of its plant to Muskegon Heights.

Velie Loses Lloyd—George H. Lloyd, sales manager of the Velie Motor Vehicle Co. since its incorporation in 1908, has resigned his position. He has not decided definitely on future plans.

Chevrolet After Another Plant—It is reported on good authority that the Chevrolet Motor Co. has purchased the Imperial Wheel Works plant in Flint, Mich., and will open a factory there on September 1. This factory has been secured as a branch plant to the Detroit factory and it will be used for the manufacture of the motors for the new Chevrolet cars.

Champion Expanding—Work has been begun on an addition to the plant of the Champion Ignition Co. at Flint, Mich. At the present time the company is supplying about eighty-six manufacturers of cars with spark plugs, and the number will be increased to 120 within the next 2 months. The company employs about 120 persons, of whom about eighty-five are women.

Keeton Locates in Canada—The Keeton Motor Car Co. recently concluded arrangements for the formation of a Canadian company, the Keeton Motors, Limited, and a factory has been secured at Brantford, Ont. The Keeton Motors, Limited, is incorporated for $200,000, all paid up, and is backed by members of the Verity Plow Co., which is part of the Massey-Harris company. Another heavy stockholder is J. D. Detweiller, of the Steel Co. of Canada. The Canadian plant has about 30,000 square feet of floor space and will have capacity of 350 cars per year, taking care of the Canadian, English and Australian business.

Pharis Buys Newark Factory—The Pharis Brothers Rubber Co., of 121 East Gay street, Columbus, O., has closed a deal for the purchase of the Newark Tire and Rubber Co., of Newark, O., and will remove the plant to Columbus as soon as a suitable location is secured. The Pharis Brothers company has been selling the Pharis tire manufactured by the Mansfield Tire and Rubber Co., of Mansfield. The Newark company's tire will be manufactured and sold under the name of the Pharis in the future. The company expects to employ 100 men.

Service for Gas Tank Users—The Prest-O-Lite Co. announces that its various service stations stand ready to examine free of charge any gas tank line that is suspected of leaking and to show to owners how to deliver the full capacity of each tank to the lamps. Free service is also given in making any needed adjustments on the Prest-O-Starter, the Prest-O-Lite and other Prest-O-Lite products. These service stations are now in operation in Atlanta, Baltimore, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Denver, Detroit, Indianapolis, Jacksonville, Kansas City, Los Angeles, Memphis, Milwaukee, Minneapolis, New Orleans, New York, Omaha, Philadelphia, Pittsburgh, Providence, St. Louis, St. Paul, San Francisco and Seattle.

NEW CANADIAN PLANT OF SCHACHT COMPANY

Havers Buys a Plant—The Havers Motor Car Co. has purchased the Studebaker Corporation's E-M-F factory at Port Huron, Mich. The consideration has not been made public. The Havers company is making extensive preparations for a greatly increased output and this is the first concrete evidence of its expansion policy. The Studebaker Corporation in selling this plant has done so for the reason that it desires to make all its model 30 cars at the one plant in Detroit.

Duplex Board Re-elected—At the annual meeting of the stockholders of the Duplex Power Car Co., of Charlotte, Mich., the officers who have been acting for the last year were re-elected as follows: President, Frank P. Town; vice-president, Frank King; secretary, W. G. Wisner; treasurer, C. S. Brown. The directors are: The officers except Mr. Brown, and J. H. Brown, Robert Donovan, Bert Taylor and M. J. Lampson.

In Receiver's Hands—The Barndt & Johnston Auto Supply Co., which has been operating a plant in South Columbus, O., for a number of years, was thrown in the hands of Fred W. Herbst as receiver upon the application of the City National Bank of Columbus, which claimed to be unable to collect a judgment of $5,000 against the corporation. The officials of the company did not oppose the action, although they contended the concern is solvent. It is alleged that bills receivable more than offset the debts of the concern and that $200,000 worth of business is on the books. The plant will be continued in operation under Charles Barndt and W. R. Johnson as managers. The petition was one of the results of the death of Dr. L. M. Early, a heavy stockholder in the company.

Engine Company Growing—The Mason Motor Co., of Flint, Mich., after a year of business, has found it necessary to add 15,000 square feet of space to its present plant. The fiscal year of the company closes September 1 and it is expected that by that time 2,500 motors will have been turned out. The company manufactures motors for the Little Motor Co.'s cars.

To Increase Oakland Output—That the Oakland Motor Car Co., of Pontiac, Mich., will turn out 11,500 cars next season is the announcement made by George E. Daniels, vice-president and general manager of the company. To provide for this increase in output a number of factory additions will be made, providing in all for 300,000 square feet of additional space.

Fisher Wants Road Fixed—Carl G. Fisher and James A. Allison, owners of the Prest-O-Lite Co. and promoters of Speedway, the horseless city, have called on city officials demanding that they keep a promise made some months ago that a paved roadway would be provided connecting the paved streets of the city with the Crawfordsville road. The Prest-O-Lite Co. is building a new plant at Speedway, which is located on the Crawfordsville road. At present there is one bad stretch which makes it almost impossible to reach Speedway by road several months in each year. The city officials have promised to take up the matter immediately and if it is found impossible to provide a paved street this year, temporary repairs to provide a passable road during the winter will be made.

and Dealers

TRUCK FACTORY OF STEWART MOTOR CORPORATION OF BUFFALO

There have been rumors that unless the paved road is provided shortly the Prest-O-Lite Co. will move to some other city. Mr. Fisher says, however, that his company has no thought of moving elsewhere.

Irvin Adding to Body Plant—An additional factory building is being erected at Morris and Division streets, Indianapolis, for the R. J. Irvin Mfg. Co., which manufactures motor car bodies and tops. The building will be two stories high, of brick construction, 50 by 407 feet and will cost about $50,000. The Irvin company also has one building 50 by 275 feet and another building 50 by 126 feet.

Fisk Increasing Capacity—The Fisk Rubber Co. is making extensive additions to its plant in Chicopee Falls, Mass. Contracts have been let for two buildings, one 250 feet long, 90 feet wide, six stories and basement and the other 200 feet long, 60 feet wide, four stories and basement. Necessary rubber machinery, boilers and engine for power plant are to be installed, which will increase the present capacity about 50 per cent. This extra capacity will necessitate the employment of 600 or 700 more workmen. Buildings are to be completed and machinery installed by November 1, 1912.

Tackle Second-Hand Proposition—The Rochester Automobile Dealers' Association of Rochester, N. Y., is considering the advisability of installing a central market for the sale of second-hand cars to prevent price-cutting among dealers in exchange of old cars for new models. Under the plan of a central mart, every dealer of the association is ordered to confer with the officers of the mart before making offers for a second-hand car. Upon joining the mart each dealer must put up bond of $1,000 and sign agreement articles. For a violation of the agreements the dealer is fined $100, for a second violation $500, and should he violate the articles a third time the dealer is promptly expelled from the mart.

Packard Has Bright Outlook—The entire factory allotment of 1913 Packard six model 48 cars which was turned out for the summer business has been contracted for. So brisk has been its sales that the Packard company is now not in a position to make deliveries on any model of its manufacture. Deliveries on the new six-cylinder 38, however, will be commenced early in September.

Will Move to Waukesha—The Chicago Brass and Bronze Co., of Chicago, has accepted the offer of the Business Men's Association of Waukesha, Wis., to relocate its plant. The company has leased the former Wisconsin Railway car shops and is already making improvements and installing equipment. There are four buildings, the main one 113 by 275 feet, and the three others 60 by 90 feet. The new industry is welcomed by the motor industry, notably the Waukesha Motor Co., of Waukesha, which will profit by having a plant to produce its brass and aluminum castings near at hand.

Brisk Business in Nebraska—Nebraska is buying motor cars faster this year than ever before. The state ranked eleventh in number of cars at the beginning of the year, although it is much farther down the list in population. Last year there were 8,608 motor vehicle registrations with the secretary of state. This year, up to July 20, there were 6,158, indicating that the record of last year will be far surpassed. Already there are more registrations than during any previous year except last year. Omaha is buying its share of these cars, buying nearly 600 last year alone. Omaha's row is filling up rapidly. Five new buildings for use as motor concerns are being erected now. There are thirty-eight car dealers in the city now, exclusive of supply houses, tire branches, garage and repair shops.

To Make Light Deliveries—After more than a year of experimenting the Durant-Dort Co., of Flint, Mich., has decided upon a departure. The company has decided to engage in the manufacture of light motor delivery wagons and has secured the material for the first 100 cars. The class of car will be similar to that of the horse-drawn vehicle now manufactured by the company.

New Marion Sales Manager—Flavius G. W. Sudrow has resigned as sales manager of the Apple Electric Co., of Dayton, Ohio, to become sales manager of the Marion Motor Car Co., of Indianapolis, Ind. Mr. Sudrow was secretary and treasurer of the former National Battery Co., of Buffalo, N. Y., for about 8 years, purchasing agent for the Dayton Motor Car Co. for over a year, and during the past winter manager of the Apple Electric Co.'s Detroit branch.

Columbus, Ind., Successful—The Commercial Club, of Columbus, Ind., has completed selling 150 building lots, which sale was necessary to obtain a $250,000 factory which will manufacture motor cylinder castings. Of the $45,000 obtained by the sale of lots, $25,000 is to be used in paying the debts of the Caldwell Mfg. Co., whose plant is to be taken over by the new company, which will be incorporated with $75,000 capital. Those interested in the new company are J. I. Handley, of Indianapolis, president of the Marion Motor Car Co. and of the American Motors Co.; S. H. Penfield, Fletcher Goodwell and Benjamin S. Dean, of Jamestown, N. Y.

R. C. H.'s Export Business—During the first 6 months of 1912, 2,208 cars were shipped from Detroit to points outside the United States according to figures recently compiled by the Detroit Board of Commerce. Of these, 502 or over 22 per cent were R. C. H. cars going to all parts of the world. The export business of the R. C. H. still continues to grow. Hardly a week passes but what one or two new selling contracts are closed for foreign territory. Among the latest are France and the section centering around Shanghai, China. For France arrangements have been closed with one of the largest car concerns. Plans are complete for opening a salesroom in Paris that will be among the finest in the city. To supply the recently established R. C. H. business in Shanghai another shipment is now on the way. This territory is handled through Manila dealers and in the short time cars have been there great success has been registered. Another notable export shipment of the past week was six cars bound for Peru. This, however, is not a new contract, being a follow-up order.

Development Briefs

Rotary Valve Engine Invented by Dentist Has Novel Features—Accelerator Foot Throttle for Ford Cars —Puckett Rear Signal Lamp—Grant Anchor Plug

FIG. 1—ANCHOR SPARK PLUG

Dentist's Rotary-Valve Motor

A ROTARY vale, four-cycle gasoline engine which is decidedly original in design, has been invented by Dr. F. S. Thronley of Clarion, Ia. It appears to be the first motor to use a rotary valve on the piston head itself. Referring to the drawing, the valve members consist of a double disk, secured to the piston head at A, and actuated by a valve stem which is rotated by an actuating rod R attached to the connecting rod by a bearing at B and actuated by a worm gear W geared at half-time to a driving gear on the crank. The intake port, I-3, is located on the right side of the cylinder, just below the bottom of the piston stroke, and the exhaust port E-3 is directly opposite it on the left side. Inlet lead I-2 and exhaust lead E-2 are cast in the piston and lead to inlet port 1-1 and exhaust port E-1 in the piston head. These ports are segmental and correspond with the valve opening P in the valve disk.

To allow for the rocking of the connecting rod on the wrist pin, a universal joint is formed by the junction of the valve stem at C and the actuating rod at R. Means of adjusting the valve-timing is provided by a washer K which determines the position of the driving gear in respect to the worm gear W. The worm gear is kept in proper relation to the actuating rod R by means of an adjustment at G. At D is a nut which holds the worm gear in place, and permits of its instant removal. Thorough lubrication is assured by an arrangement whereby a dipper F forces the oil which it picks up from the bottom of the crankcase through the lead H to the duct O in the valve disk. A ball check-valve is located at V to prevent the return of this oil.

A device for the removal of carbon deposits in the piston head is also a feature of the invention, although it has not been incorporated in the design. It consists of a stationary scraper, against which the valve disk revolves.

It is claimed that such an engine would be noiseless except for the exhaust, as no springs are used, and the only gearing is of the worm type, and completely enclosed.

Accelerator for Ford Cars

In order to provide an accelerator which may be attached to model T Fords whereby the throttle can be operated by a toe button in addition to the standard throttle lever on the steering wheel, the Lincoln Machine Shops, Lincoln, Ill., is manufacturing a very simple equipment which may be easily attached without machine work and sells at $1.50. The attachment is shown in place in Fig. 2. In making the connections the regular rod to the carbureter is removed. The triangular plate is attached by bolting under the cylinder head bolts of the third and fourth cylinders and the short rod attached to the hand throttle rod. It is held by a spring to one of the base bolts and an adjustable rod to the carbureter installed. A pedal inserted in the footboard is connected by cable.

Puckett Signal Lamp

The combined signal and number displaying lamp illustrated at the right of Fig. 5 is the product of Almor M. Puckett, San Antonio, Tex. It is a tail light which shows a ruby light at the rear and above it displays the illuminated number plate. In construction it consists of a metal box 16 inches in length, 3 inches in width and 6½ inches in height. As illustrated at B, the box has a hinged opening on top where a felt-lined frame is inserted which holds the number of regulation size, also a blank ruby red glass for a rear signal. The numbers are white frosted,

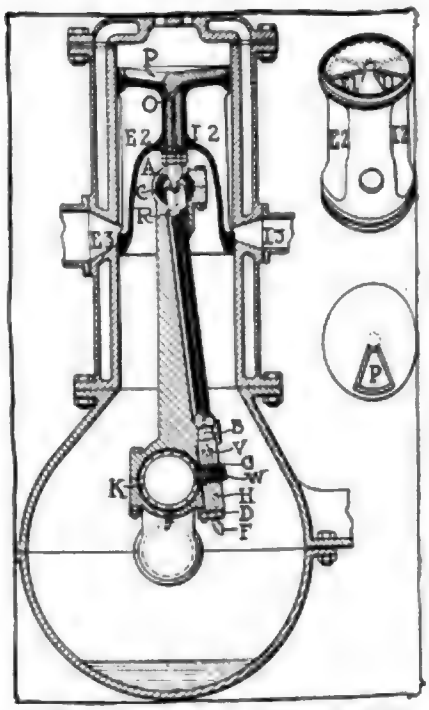


FIG. 3—THORNLEY ROTARY VALVE MOTOR

Grant Anchor Spark Plug

In Fig. 1 is illustrated what is claimed to be a self-cleaning, oil-proof spark plug. This is the Grant anchor plug, marketed by the General Illuminating Co., New York city. Its construction consists of a steel body provided with a plug thread into which is placed the insulating body by means of lock nuts. A pure nickel electrode which passes through the insulating body is bent back at its lower end in the shape of an anchor against a mass pole which acts as an oil protecter. It is claimed that the length of the insulating body prevents the passage of sparks between the nut through which the current passes and

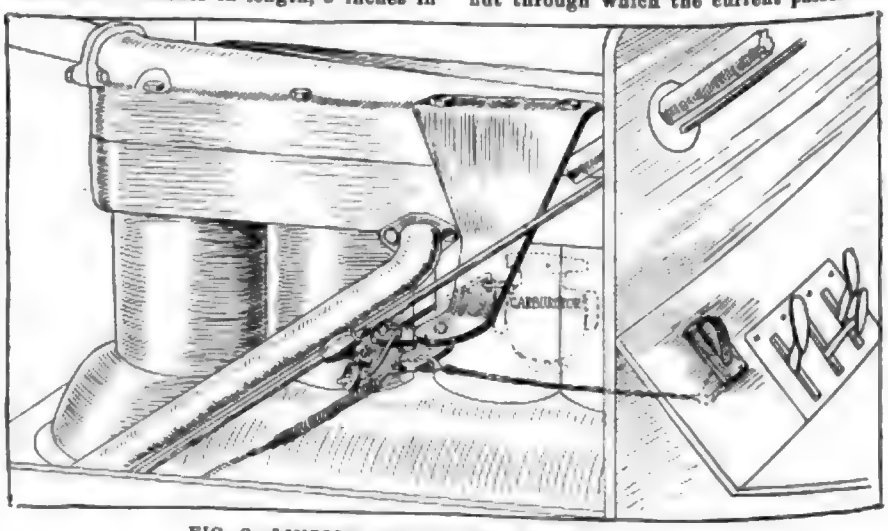


FIG. 2—LINCOLN ACCELERATOR FOR FORD CARS

Novelties for Motoring

Silver King Extension Wrenches—Combination Radial and Thrust Ball Bearing—New Headlights Burn Alcohol—Another Substitute for Pneumatics

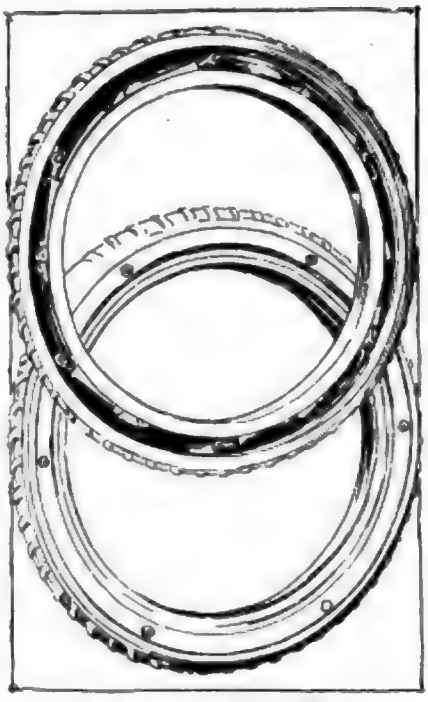


FIG. 4—FERROMATIC TIRE

the steel body. The spark is formed between the nickel electrode and the oil protecter, and on account of the air cushion formed behind it, it is said to be impossible for any oil to get there. Owing to the construction of the plug, no dismounting is needed. Should it by any chance be necessary to clean the plug, a light brush over the oil protector is all that is required.

Silver King Wrenches

The C. M. B. Wrench Co., Syracuse, N. Y., has recently produced some refinements in its line of extension wrenches. In Fig. 5, are illustrated three of the ways in which the new Silver King wrench set may be employed. The set consists of an adjustable ratchet handle head and T with adjustable ball joint; also a universal joint, two extensions, spark plug wrench, screwdriver, 17 sockets to fit all standard hexogon nuts from ¼ to ⅝-inch and cap screws from ¼ to 5/16-inch, and square nuts from 5/16 to ⅝-inch. At A is shown the ratchet drill attachment placed in the wrench head ready for use. The handle will swing at any position required to dodge obstacles. B shows the long extension with screwdriver and adjustable ratchet wrench attached. The ratchet is arranged to slide up and down on the extension bar and the handle will swing to any angle giving a double adjustment. C illustrates the adjustable handle on the ratchet wrench head used on the universal joint, with the extension on the universal joint, making a double adjustment which can be operated in places where no straight-handled wrench can be used.

Globe Duplex Combination Bearing.

The Globe Ball Bearing Co., of New York, has just brought out a combination radial and thrust ball bearing, of original design, a sketch of which is reproduced in Fig. 6. It consists of a double race, which takes direct loads and direct thrust. The balls are of two diameters, and the bearing is of the non-adjustable type.

Alcohol Headlights

A self-contained headlight is marketed by the Butylite Automobile Headlights Co., New York. This uses neither tank, generator, nor dynamo. No wires or tubes are necessary, and the lamp may be demounted at will, for use as a trouble lamp, or for exploring. Alcohol is the fuel, and it is burned in an incandescent mantle. The lamp differs in no way in appearance from the ordinary gas lamp, and uses a parabolic reflector in place of the usual mirror lens. One quart of alcohol, it is claimed, will give approximately 70 candlepower for 20 hours, at one filling. An ordinary tire pump is used to pump up the air pressure, a Schrader valve being used. An air-gauge is fitted to insure the proper pressure for satisfactory operation. The mantle, due to its small size and great thickness, is said to be immune to road shocks, being of a special patented make. It is asserted that this lamp may be burned for as little as 1 cent an hour.

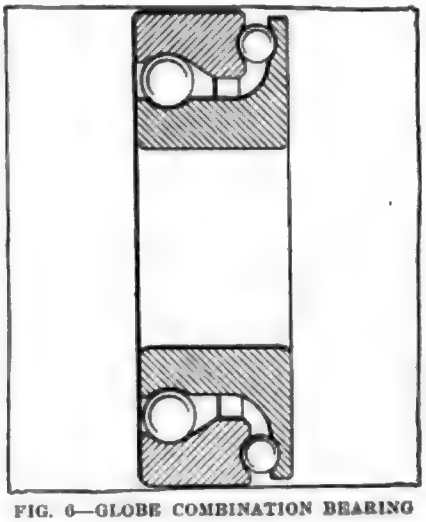


FIG. 6—GLOBE COMBINATION BEARING

The Ferromatic Tire

Interchangeable with pneumatic tires, the Ferromatic tire, which is the product of the Ferromatic Tire and Mfg. Co., Kansas City, Mo., adds one more to the number of substitutes for the much-malinged pneumatic. In appearance it differs only slightly from the pneumatic of equal size, and uses a tread quite similar. It is composed of two normally concentric rings, connected by diagonally placed helical springs, which are made of vanadium steel, and form the resilient element of the tire. The outer ring, which is of pressed steel, is provided with a rubber tread, and the inner, also of pressed steel, being so formed as to fit the standard clincher or quick-detachable rims. The springs number from 5 to 8 according to the size of tire. It is claimed that this spring tire weighs only slightly more than the ordinary pneumatic of corresponding size. It is illustrated in Fig. 4.

Non-Corrosive Metal Polish

To supply the demand for a polish for nickel and German silver that would not corrode nor unduly wear such metals, the Armiger Chemical Co., Chicago, has just brought out Rex Velvet nickel polish. It is claimed to polish nickel, nickel plate, and German silver surfaces as readily as other polishes, but to wear the metal considerably less, and to spread a film of protecting substance over it to prevent corrosion.

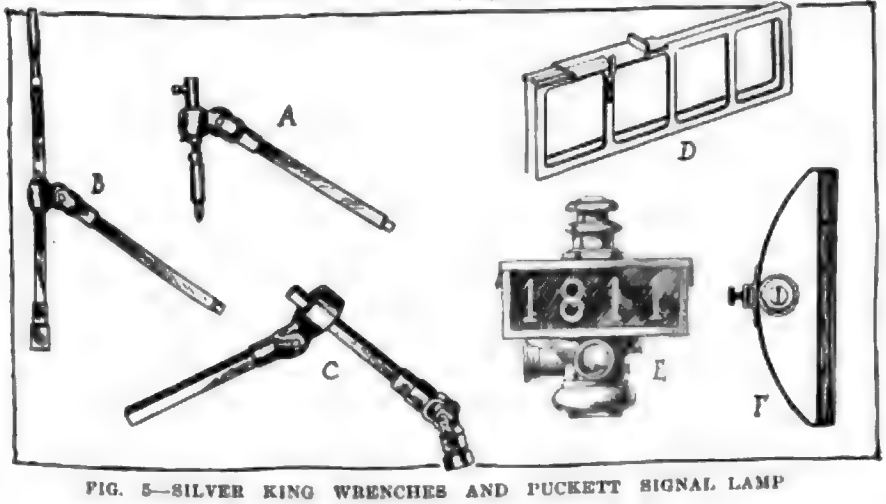


FIG. 5—SILVER KING WRENCHES AND PUCKETT SIGNAL LAMP

Brief Business Announcements

Recent Agencies Appointed by Car and Truck Manufacturers

PLEASURE CARS

Town—	Agent	Make
Albany, N. Y.	Albany Garage Co.	Peerless and White
Andalusia, Ala.	Fletcher & O'Neal	R. C. H.
Austin, Minn.	A. W. Wolten	R. C. H.
Babylon, N. Y.	George Haab	R. C. H.
Baltimore, Md.	H. S. Block	Stoddard-Dayton
Baltimore, Md.	Rittenhouse-Winterson Auto Co.	Cartercar
Benton, Pa.	John F. Wright	R. C. H.
Chicago, Ill.	G. A. Jacobs	R. C. H.
Cleveland, O.	Gus A. Baumetz	R. C. H.
Cleveland, O.	John B. Hargis	R. C. H.
Cleveland, O.	Oakland Motor Car Co.	Oakland
Columbus, O.	Sitgreaves Auto Livery	Mercer
Columbus, O.	Sitgraves & Boyd	R. C. H.
Columbia, S. C.	Independent Auto Sales Co.	R. C. H.
Danville, Ill.	John P. Agan	R. C. H.
Denver, Colo.	William Thorney Auto Co.	R. C. H.
Dixon, Ia.	Hensen Auto Co.	R. C. H.
Dodge Center, Minn.	G. F. Wolter	R. C. H.
Dothan, Ala.	Dothan Carriage Co.	R. C. H.
Elkhart, Ind.	A. C. Adams	R. C. H.
Faribault, Minn.	Mutual Auto Co.	R. C. H.
Gagetown, Mich.	Gagetown Auto Co.	R. C. H.
Geneva, N. Y.	D. M. Dorman	R. C. H.
Greeley, Colo.	G. S. Hammett	R. C. H.
Greensboro, N. C.	P. Watt Richardson	R. C. H.
Honey Grove, Tex.	J. I. Warren	R. C. H.
Huron, S. D.	E. I. Bowe	R. C. H.
Indianapolis, Ind.	Conduitt Automobile Co.	Chalmers
Knoxville, Tenn.	Vest & Anderson Co.	R. C. H.
Lakefield, Minn.	Finch & Stinar	R. C. H.
Little Valley, N. Y.	H. W. Burrell and D. J. Case	R. C. H.
Louisville, Ky.	Allen E. Reid	Overland
Luthersville, Ga.	A. O. Williams	R. C. H.
Machias, Me.	Crane Brothers	R. C. H.
Madison, Wis.	Ritter Automobile Co.	Hudson
Milton, N. D.	Rolph Prom	R. C. H.
Minneapolis, Minn.	Mercer Sales Co.	Mercer
Monticello, Ind.	Clifford Auto Co.	R. C. H.
Montreal, Can.	Standard Electric Garage	Hupp and Flat
Montreal, Can.	J. O. Collotte	Little
Moody, Tex.	Clay & Gilmore	R. C. H.
Mount Pleasant, Tex.	Ralph H. Love	R. C. H.
Newcomerstown, O.	Norman Garage Co.	R. C. H.
New Haven, Conn.	Cowles Toleman	R. C. H.
New London, Conn.	E. A. Meyers and C. M. Lippincott	R. C. H.
Newark, N. Y.	L. H. Farnsworth and H. J. Welcher	R. C. H.
Norristown, Pa.	Daniel H. White	R. C. H.
Norwich, Conn.	The Uncas Garage	R. C. H.
Pensacola, Fla.	W. L. Wittich & Co.	R. C. H.
Peru, Ill.	A. A. Bakewell	R. C. H.
Pine Bluff, Ark.	Pine Bluff Motor Car Co.	Mercer
Portland, Me.	Fred D. Morse	R. C. H.
Poughkeepsie, N. Y.	E. B. Delamater	R. C. H.
Oswego, N. Y.	Rowe & Sikes	R. C. H.
Ottawa, Kan.	John Nelson & Son	R. C. H.
Quincy, Ill.	Reid Motor Co.	R. C. H.
Quincy, Mass.	Central Garage	R. C. H.
Redfield, S. D.	Blaine Auto Co.	R. C. H.
Rochester, N. Y.	Empire State General Vehicle Co.	Locomobile
Rochester, N. Y.	Gillis-Baird Motor Co.	Hudson
Roswell, Ga.	H. A. Walton and C. W. Ellington	R. C. H.
Salem, O.	Salem Auto and Repair Co.	R. C. H.
San Luis Obispo, Cal.	R. A. Minor	R. C. H.
Saranac Lake, N. Y.	Duquette & Moody	R. C. H.
Scottdale, Pa.	Claude Murphy	R. C. H.
South Bend, Ind.	Otis Motor Car Co.	R. C. H.
Topeka, Kan.	J. C. Vanier	R. C. H.
Traverse City, Mich.	The Hines Motor Co.	R. C. H.
Tuchahoe, N. J.	A. B. Adams	R. C. H.
Uhrichsville, O.	J. W. Lytle	R. C. H.
Vancouver, B. C.	Terminal City Motor Co.	Mercer
Wapakoneta, O.	C. J. McFarland	Mercer
Ware, Mass.	Hoyt Brothers	R. C. H.
Waycross, Ga.	H. L. Marvill	R. C. H.
Windsor, Ont.	F. S. Evans	King
Windom, Minn.	Walter P. Cowan	R. C. H.
Winona, Minn.	E. J. Tisdale	R. C. H.
Wilmont, Minn.	Olund & Nystrom	R. C. H.
Witt, Va.	G. H. Guerrant	R. C. H.
Yates Center, Kan.	Patterson & Patterson	R. C. H.
Youngstown, O.	R. L. Culbertson & Co.	Mercer

TRUCKS

Town—	Agent	Make
Cleveland, O.	Windermere Garage	Sanford
Cleveland, O.	A. W. Hall Automobile Co.	Hatfield
Baltimore, Md.	Rittenhouse-Winterson Auto Co.	Seitz
Binghamton, N. Y.	M. T. Rogers	Alco
Holyoke, Mass.	Magna Auto Co.	Adams
Peekskill, N. Y.	W. H. Ask	Alco
Montreal, Can.	Standard Electric Garage	G. M. C.

CONWAY, Mass.—A. J. Patterson is having a large garage built on Main street that will be ready in a few weeks.

Washington, D. C.—The G. R. Cowie Co., agent for the Cole, at 1315 H street, N. W., has been appointed agent for the R. C. H. in this section.

Chicago—A new service station and salesrooms at 1700 Wabash avenue has been opened for Chicago users of Durable Dayton motor trucks.

York, Pa.—The J. W. Reichley Auto Co., 237 East Philadelphia street, has completed the remodeling of its garage. A large two-story brick structure was added to the former building. The garage is the largest in the city, having 14,000 feet of floor space. The building will easily accommodate 125 cars.

Milwaukee, Wis.—George W. Browne, state agent for the Overland, Marmon and Stutz, 458-462 Milwaukee street, has organized two corporations to succeed the individual business. The Overland Wisconsin Co. is capitalized at $50,000 and its incorporators are George W. Browne, T. C. McMillan and Mark F. Browne. The style of the other corporation is George W. Browne, Automobiles, and the authorized capital is $5,000, the incorporators being the same as those of the Overland Wisconsin Co.

Louisville, Ky.—The Brandeis Machinery and Supply Co. has secured the agency for Imperial tires in this vicinity.

Pittsburgh, Pa.—The Lawrence Automobile Co., of New Castle, Pa., has been granted a state charter. The concern is capitalized at $40,000.

Fox Lake, Wis.—Joseph Hartle has established a garage and repair shop on Mechanic street. He has not closed his agency line as yet.

Ansonia, Conn.—Kolman Luria is to erect a garage 60 by 40 feet on his property at the southwest corner of Main and Colburn streets, Ansonia, in the near future.

Buffalo, N. Y.—The Mutual Motor Car Co., which concern was incorporated last week at Buffalo, has secured the agency for the Marathon in New York state and the Warren car in northern Pennsylvania and western New York. Instead of handling the business from the office of the Poppenberg Motor Car Co. at 674 Main street, as was the original intention, the directors have secured for the salesroom and office the premises at 923 Main street, while their garage will be located at 479-483 Pearl street.

Barton, Vt.—A new garage is nearing completion at Barton for True & Blanchard. It is of brick, concrete and steel.

Racine, Wis.—The Racine Rubber Co., of Racine, Wis., has changed its corporate style to Belle City Rubber Co. J. W. Bate is president.

Cleveland, O.—The Park Motor Car Co., distributor of the Metz, has been reorganized under the name of the Park Motor Mfg. Co., with a capitalization of $15,000.

Indianapolis, Ind.—With an authorized capitalization of $2,000 the A & M Sales and Service Co. has been organized and incorporated in Indianapolis and will distribute the Marion and American cars. Officers of the new company are: President, J. I. Handley, who is president of the Marion Motor Car Co. and American Motors Co.; vice-president and general manager, Thomas L. Marshall, and secretary and treasurer, J. R. Wilbur. Temporary quarters have been established with the American Sales Co., at 517 North Capitol avenue. The new company's ter

ritory will include Indiana, western Ohio, southeastern Illinois and western Kentucky.

Sigourney, Ia.—The Kendall-Friday Co. is building a large garage and will handle motor cars, gas engines, farm electric plants and supplies in a wholesale way.

Boston, Mass.—Louis J. Sackett who was recently with the Cadillac agency in Boston, has been appointed manager of the Boston branch of the Oakland.

Manitowoc, Wis.—L. J. Anderson is building a $15,000 garage and shop on Commercial street, and will distribute the Studebaker line in Manitowoc and vicinity.

Seattle, Wash.—C. J. Bonness, formerly with Chanselor & Lyon, more recently with the United States Tire Co., has taken the agency for the Miller tires in Seattle.

Omaha, Neb.—Doty & Hathaway has taken the agency for the Little Four, and has opened up a garage at 1902 Farnam street. L. E. Doty formerly was manager of the United Motor Omaha Co.

Milwaukee, Wis.—The Sanger Automobile Co., of Milwaukee, has formally opened its new garage at 564-574 Farwell avenue. The building has dimensions of 100 by 150 feet and can accommodate from 150 to 200 cars.

Sanford, Me.—Hannaford Barr and George Stilphen, of Sanford, Me., have formed the Maine Auto Co. They have started work on the ground floor of the old fire station on Mechanic street, fitting it up as a garage and general supply station.

Buffalo, N. Y.—The Diamond Rubber Co. has opened a mechanical goods branch at 721 Main street. A. A. Lyon has been appointed manager of the branch which will carry rubber mechanical goods, including belting, hose and packing, and Diamond tires.

Washington, D. C.—T. S. Johnston has resigned as manager of the Buick Motor Co.'s branch here to accept a position as manager of the Republic Motor Co.'s branch in Philadelphia. He will work the southern territory from Philadelphia south to Florida.

South Bend, Ind.—Hanson Robinson, for the past 5 years in charge of the sales of Studebaker electric trucks in South Bend, has gone to Detroit, where he takes a position as manager of the sales department of gasoline and electric trucks.

Cleveland, O.—Merging the United States Motor Co.'s interests places Dr. F. E. McClure in charge of the marketing of all of the company's products in the Cleveland district. He retains the management of the States Cleveland Motor Co., which handles the Stoddard-Dayton, Brush and Courier cars, and in addition will have charge of the marketing of Columbia and Maxwell, which the United Motor Cleveland Co. markets. C. H. Tyler, former manager of the United Motor Cleveland Co., has left to become special representative of the Marion Motor Car Co. in the central west.

Kaukauna, Wis.—The Kaukauna Auto Co. has leased the Griswold building and will open a garage and salesrooms. The company has the agency for the Marathon.

Kalamazoo, Mich.—William J. Slater, formerly advertising manager of the Firestone Tire and Rubber Co., has been made assistant sales manager of the Michigan Buggy Co.

Moline, Ill.—The Moline Auto Co. is to build an extension to its East Moline plant, a building 60 by 160 feet to be constructed for use as repair shop and repair stock room.

Blackstone, Mass.—The old McDonald store on River street, Blackstone, Mass., has been purchased by Mrs. George Ashton, who will build a public garage on the property.

Racine, Wis.—The Jensen Electrical Co., of Racine, Wis., has moved from 1524 Washington street to new quarters at 1504-1508 Washington street. The company deals in illumination and ignition supplies and does repair work.

Detroit, Mich.—Procter Brevard, who has been associated with the Hudson Motor Car Co. in the capacity of experimental engineer for the past year and a half, has resigned his position and is now with the Zenith Carbureter Co.

New London, Wis.—The H. A. Steiner Co., of Chilton, manufacturing gasoline engines and motors, is negotiating with local capitalists for re-location of its works. A bonus of $13,000, to be subscribed for its stock, is demanded.

Cleveland, O.—In furtherance of the new sales policy of the Oakland company, a factory branch has been opened here, where this car will be handled exclusively. The present quarters on Euclid avenue at East Twentieth street are temporary, until a suitable location can be secured for a permanent location. Fred C. Wood is in charge of the new established factory branch.

Anderson, Ind.—Hunter & Co., of Steubenville O., has taken the agency for the Nyborg cars in the county. L. F. Carr, of Jacksonville, Fla., will represent the Nyberg in Duval, St. John, Brevard, St. Luciel, Palm Beach and Dage counties. Mr. Carr now has under construction a large garage in Jacksonville. Jack Williams is the new agent at Buxton, Ia., for the Nyberg.

Columbus, O.—A partnership consisting of Fred Boyd, formerly connected with the Curtin-Williams Automobile Co., and G. L. Sitgreaves has been formed under the name of Boyd & Sitgreaves to operate a garage and sales agency at 42 West Capitol street. The partnership will handle the Simplex, Mercer and Apperson lines in central Ohio during the season of 1913. The concern occupies a new garage which is 80 by 140 feet without a post in it. Mr. Sitgreaves also is operating a taxicab business in Columbus.

Detroit, Mich.—F. C. Gumper, formerly connected with the Bussel Motor Axle Co., North Detroit, since its inception, has joined the sales forces of the Krit Motor Car Co.

Minneapolis, Minn.—The Minneapolis Auto Trading Co. will handle two new truck lines—the Commerce and the Universal. D. N. Hume and R. G. Ragen make the firm. Mr. Ragen was formerly with the Peerless, Packard, Studebaker and Elmore firms.

Boston, Mass.—T. N. Hayes is erecting a brick garage at 15-17 Berkeley street.

Lansing, Mich.—L. C. Smith, formerly assistant advertising director of the General Motors Co., has been placed in charge of the advertising of the Olds Motor Works, Lansing, Mich.

Detroit, Mich.—The Oakland Motor Car Co., Pontiac, Mich., has opened a sales branch in Detroit, with William R. Tracy, for the past two seasons sales manager of the Oakland Sales Co., Ltd., as its manager. J. F. Montgomery has resigned from the Bemb-Robinson company to take a sales position with this new Oakland branch.

St. Paul, Minn.—Smith & Heberle, 195 West Sixth street, St. Paul, has taken the Minneapolis agency for the Hudson car and will open a garage at 907 Hennepin avenue, maintaining its St. Paul agency as before. The Minneapolis Hudson Auto Sales Co. will continue at the present place, 1400 Hennepin avenue, in the used car business.

Davenport, Ia.—The Union Motor Co., agent for the Oldsmobile and the Buick lines, has moved from its former location, 114 Brady street, to new headquarters at 527-31 West Third street. The new garage, which is of brick construction with stucco front, is 64 by 81 feet in dimensions. Louis Otto is president and general manager of the company.

Sheboygan, Wis.—The Rummele garage, Center avenue, is being entirely remodeled and space will be allotted to the charging and display of electric cars, the company having taken the agency for the Detroit electric. A new two-story glass front is being built in place of the present wooden front and an additional entrance driveway is provided. George Ferry is manager of the garage.

Montreal, Que.—Following are a few details about the Mount Royal garage. The capitalization of the company building it is $500,000. The building will be 70 by 200 feet, six stories and basement and steam-heated, with modern equipment. It will have a capacity of 300 to 400 cars. Two elevators, 3 to 5-ton capacity, will be constantly running. Commodious chauffeurs' quarters and comfortably furnished waiting rooms and toilet rooms will be part of the equipment. A fully equipped paint, re-

pair and machine shop will be provided as well as modern methods of storing and delivering gasoline, oil, compressed air, etc.

Detroit, Mich.—R. J. Mantell, Jr., has just opened a branch of Louis Dusenberry & Co., at 804 Woodward avenue. This concern makes upholstering and lap-robe fabrics.

Pittsburgh, Pa.—A factory branch of the Motz Tire and Rubber Co., of Akron, Ohio, has just been opened at 300 North Craig street. S. H. Fronsdorf is in charge of the new factory branch.

Buffalo, N. Y.—The Crosby Co., manufacturer of motor car frames, is constructing an addition to its plant. The entire structure, when the addition is completed, will be four stories in height and of steel construction.

Moline, Ill.—E. H. Wiles has accepted a position with the Velie Motor Vehicle Co., being appointed superintendent of experimental work, a department which is meeting with special attention from the Velie company.

Moline, Ill.—The Moline Automobile Co. has established a branch house at Los Angeles with O. J. Root as manager and in charge of all sales on the Pacific coast, the general plans of the company being to devote more attention than formerly to the trade west of the Rockies. The Ben-Rick Auto Co. of Los Angeles, will handle the retail trade of that city and vicinity. The branch will be incorporated as the Moline Automobile Co., of Los Angeles.

Boston, Mass.—The Fred Page Co., of Lynn, Mass., maker of the P & P tire filler, has opened a branch at 108-110 Massachusetts avenue, corner of Newbury street, for the product.

Milwaukee, Wis.—Rasmus Jensen, operating one of the largest motor car repair and reconstruction shops in Milwaukee, at 61-73 Sixth street, has disposed of the business to H. W. Wilson.

Easthampton, Mass.—The mill building at the junction of Union street and Payson avenue, owned by Dibble & Warner, has been purchased by Charles Harris, who is to use it in which to manufacture motor car wheels.

Buffalo, N. Y.—E. T. Strong, for the past year manager of the local branch of the Buick Motor Car Co., 1094 Main street, has been transferred to the Indianapolis branch of that concern and is succeeded at the Buffalo office by J. S. Collins, of Saginaw, Mich.

Beloit, Wis.—The Menhall garage, operated by James W. Menhall for several years, is now known as the Beedle Automobile Co. as the result of the sale of the business and agencies to Dr. C. E. Smith, Dr. P. A. Fox and George F. Beedle. The company will represent the Columbia, Hudson, Reo, Sampson and other United States Motor Co. lines, for which Mr. Menhall will be traveling representative in Wisconsin.

Montreal, Que.—The Independent Tire Co. of Toronto, Limited, has been authorized to do business in the province of Quebec. Its chief place of business in the province is at Montreal.

Ripon, Wis.—The Modern garage has been established here by Harry J. Schwartz and J. F. Brodersen, formerly owners of the Third Street Garage Co., 685-689 Third street, Milwaukee. The new garage will represent several well known makes of cars and deal in accessories and supplies.

Washington, D. C.—Involuntary petition in bankruptcy has been filed against W. Elkins Reed, trading as the Motor Supply Shop, agent for the Hupmobile. L. C. Loving and T. C. Bradley have been appointed receivers under a bond of $5,000. Reed's total liabilities are about $6,500 and his assets $1,500.

Cedarburg, Wis.—The A. J. Meyer Motor Car Co. is the latest addition to the list at Cedarburg. The company is incorporated for $25,000 and the principal stockholders are John Armbruster, Jacob Dietrich and John F. Bruss. A garage has been established and negotiations for agencies are now going on.

Recent Incorporations

Buffalo, N. Y.—William Guillett Mfg. Co.; to deal in motor car frames and stamped metals; incorporators, William Guillett, Anna G. Guillett, Edward B. Reynolds.

Buffalo, N. Y.—Gardner Hotte Sales Co.; capital stock $10,000; to deal in motor cars, tires and tubes; incorporators, J. H. Gardner, B. H. Gardner, G. Hotte, W. E. Hotte.

Buffalo, N. Y.—Studebaker Sales Co.; capital stock $25,000; to deal in motor cars; incorporators, A. W. Maile, B. H. Phillips, E. P. Schlenker.

Buffalo, N. Y.—Chinnock Garage, Inc., capital stock $3,000; incorporators, Beatrice H. Mattoon, Adelaide Kenny, Edgar L. Chinnock.

Boston, Mass.—Elliott Motor Engine Co.; capital stock $300,000; to manufacture and deal in engines; incorporators, Gilbert R. Elliott, Frank P. Harris, W. C. Cogswell.

Cambridge, Mass.—Blake Automobile Co.; capital stock $100,000; incorporators, E. C. Blake, L. E. Gibson, Datista Vitalini.

Columbus, O.—Davies-Bach Mfg. Co.; capital stock $300,000; to manufacture tires, vehicles and motor car accessories; incorporators, George R. Nash, C. H. Davies, O. Nelson, G. Lampus, P. D. Metzer.

Chicago—Fargo Motor Car Co., capital stock $50,000; to manufacture motor cars and accessories; incorporators, E. G. Kral, B. F. Kral, J. J. Kral.

Chicago—Automobile Supply Co. of Illinois; capital stock $10,000; to manufacture motor car supplies; incorporators, Albert Norwald, Samuel Rubinsky, Harry Simmons.

Chicago—Modoc Motor Car Co.; capital stock $2,500; incorporators, Otto S. Heberling, William A. Curtis, George R. Raurgans.

Chicago—Tesla Auto Light Co.; capital stock $6,000; to manufacture motor car supplies; incorporators, Charles B. Stafford, Harry C. Lovinson, Albert Jacobs.

Cleveland, O.—No-Shammy Funnell Co.; capital stock $1,000; to deal in motor car accessories; incorporators, F. T. Kovar, George Dantel, L. Dantel, David P. Bowden, Robert H. McKay.

Hartford, Conn.—Capitol City Electric Garage Co.; capital stock $50,000; incorporators, Frank A. Champlin, James Leslie Burton, Clarence W. Seymour.

Louisville, Ky.—Central Automobile Co.; capital stock $15,000; incorporators, Walter P. Dickerson, Gus Koehler, Clyde E. S. Enrick.

Nashville, Tenn.—City Taxicab Co.; capital stock $3,500; incorporators, E. D. Dakin, T. O. Perkins, J. D. Andrews.

Newport, Ky.—Central Automobile Co.; capital stock $15,000; incorporators, Walter P. Dickerson, Gus Koebler, Clyde S. Enrick.

Newark, N. J.—Sullivan Automobile Co.; capital stock $25,000; incorporators, James Sullivan, Charles Bagole, W. N. Epanzel.

New Haven, Conn.—R. L. Bishop Motors Co.; capital stock $25,000; incorporators, Raymond Leslie Bishop, William Frank Sargent, Frank Pierce Sargent.

New York—Regal Auto Sales Co.; capital stock $5,000; incorporators, Max Hart, William N. Botto, Norman E. Mannwaring.

New York—Duffy Lubricants Manufacturing Co., capital stock $25,000; to deal in oils, etc.; incorporators, James F. Duffy, Harry W. Conklin, Harris K. Halikman.

New York—Curran Patent Co.; capital stock $10,000; devices for motor cars, machinery, etc.; incorporators, Harry J. Curran, Clara D. Curran, Charles H. Wilson.

New York—Holt-Chandler Co., capital stock $25,000; incorporators, Henry E. Holt, Frederick E. Tucker, Warren R. Chandler.

New York—Silvex Co.; capital stock $100,000; to manufacture cleaners for metals, motor car polish and motor car accessories; incorporators, Edward H. Schwab, James H. Ward, Charles M. Schwab.

New York—Harmon Yount Co.; capital stock $100,000; to deal in motor cars; incorporators, D. H. Hanckel, F. B. Hunt, H. M. Kelly.

New York—Cukor Safety Crank Co.; capital stock $40,000; incorporators, D. Cukor, H. I. Rosenblum, I. Newstaedter.

New York—Dillman Helin Motor Co. of Richmond Hill; capital stock $20,000; to manufacture engines, motors and machinery; incorporators, W. C. Dillman, R. C. Dillman, E. D. Dillman.

New York—Maxi Co.; capital stock $200,000; to manufacture carbureters; incorporators, Edward A. McCoy, Ernest Hopkinson, F. V. W. Richardson, John C. McCoy.

New York—Kelly-Field Co., capital stock $10,000; to manufacture motor cars and tires; incorporators, Charles F. U. Kelly, Harry E. Field, Jacques L. Boisse.

New York — International Automobile League Tire and Rubber Co.; capital stock $1,000,000; to manufacture, buy, sell and deal in motor cars.

Middletown, N. Y.—Industrial Motor Car Co.; capital stock $350,000; incorporators, William A. Courtland, Cuthbert W. Jewell, M. G. Crawford, Harris H. Rayl, Wheelock Mansions, Montecelle A. Bonneford.

Philadelphia, Pa. — Wallace Automobile Co.; capital stock $300,000; incorporators, Clarence Jacobs, S. E. Robinson.

Portland, Me.—Anti-Friction Bearing Co.; capital stock $500,000; to manufacture bearings for motor cars, machinery, etc.; incorporators, Charles H. Chapman, Elmer Perry, Stephen C. Perry.

St. Louis, Mo.—Pugh Auto Chair Co.; capital stock $5,000; to deal in motor car chairs; incorporators, John Schulz, A. A. Vancleave, C. C. Knight.

St. Joseph, Mo.—Northwest Missouri Auto Co.; capital stock $5,000; general motor car supply business; incorporators, Ben F. Ellington, Claude C. Tanner, Lena M. Ellington.

Seattle, Wash.—Alvord Automatic Machines Co., capital stock $30,000.

Seymour, Conn.—Seymour Motor Express Co.; capital stock $10,000; incorporators, D. H. Rixgs, C. Boles, E. H. Rolston.

South Bend, Ind.—South Bend Auto Body Co.; capital stock $20,000; incorporators, Samuel W. Nicholson, Stanley W. Nicholson, J. C. Paxson, V. E. Paxson.

Toledo, O.—W. H. McIntyre Co.; capital stock $10,000; to deal in motor cars and trucks; incorporators, W. H. McIntyre, Edward L. Laskey, Clara McIntyre, William G. Vollamayer, Frank C. Kelley.

Trenton, N. J.—M. M. Tire Co., capital stock $20,000; incorporator, William Maginnis.

Urichsville, O.—Union Delivery Co.; capital stock $5,000; to do a general motor delivery business; incorporators, J. E. Smith, John F. Cappel, Ernest C. Fox, C. W. Rosel, P. W. McCue, W. B. Devine.

Winsted, Conn.—Brown Machine Co.; capital stock $5,000; to do motor car repairing; incorporators, Edward E. Brown, Edward E. Brown, Jr., William A. Brown.

Youngstown, O.—Folberth Carbureter Co.; capital stock $70,000; incorporators, E. A. Hogg, H. A. Emery, E. A. Tobey, Joseph F. Williams, Thomas L. Morgan.

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MOTOR AGE

VOLUME XXII CHICAGO, AUGUST 22, 1912 NUMBER 8

American

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MOTOR AGE

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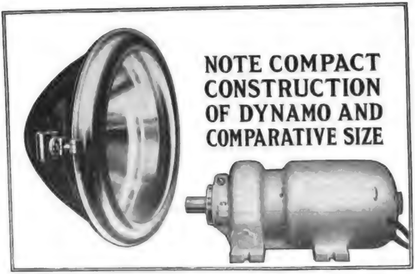
GRAY & DAVIS

LIGHTING DYNAMO SYSTEM



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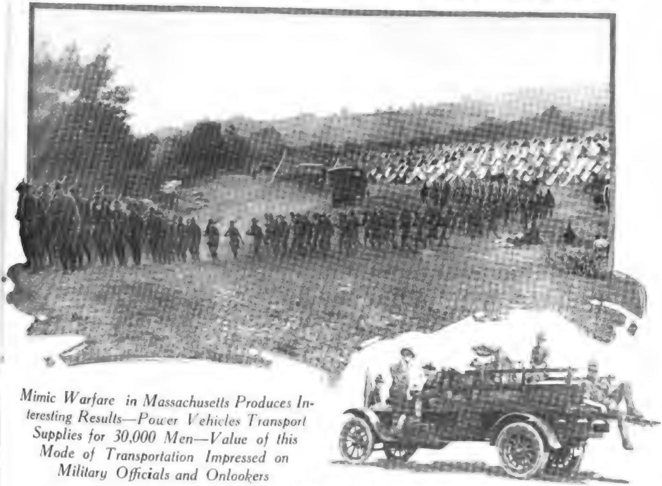

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MASSACHUSETTS MILITIAMEN TAKE PART IN ANNUAL MANEUVERS

By J. Edward Shipper

MORE than 2,000 tons of freight were handled through the bases of supply of the Red and Blue armies in 8 days during the Connecticut maneuvers just concluded. The conditions, which paralleled those of actual warfare to an exceptional degree, called for the transportation of supplies for 20,000 men through the lower Berkshire hills. Every problem which possibly could be met with in wartime in a similar country had to be faced by the motor trucks that were employed in the service of both armies, and the unequalled opportunity of showing the value of this mode of transportation was taken advantage of by the government officials and officers of the war department.

In order that the baggage-carrying problem may be understood a general idea of the plan of campaign is necessary. The Red or invading army, whose object was the capture of New York's water supply and eventually the occupation of the city itself, consisted of a full army division numbering approximately 8,000 men. All branches of the service were included, even to an aeroplane scouting outfit included in the signal corps. The army was stretched in an irregular line 20 miles in length. The position of the armies changed toward the latter part of the

SAURER TRUCK WITH LOAD OF CAMP SUPPLIES

campaign, as the Blues were driven back, but during the major part of the time the left wing of the Reds rested in and around Derby, a point 10 miles as the crow flies north of Bridgeport. From Derby the line extended to the northwest with the right wing in the vicinity of Sandy Hook, Conn.

Trucks Aid Retreat

The Blues, defending New York, were in a line opposite the Reds and practically parallel to the front of the invading army. They were slowly retreating westward to take up a strong position on Saturday, the last day of the campaign, when a vigorous battle was fought which the umpires declared a draw, although a Red victory seemed imminent. On the retreat of the Blues from Newtown back towards Bethel, which was one of the secondary supply bases, it was necessary to load considerable baggage hurriedly and send it back under guard. In this emergency it readily could be seen that it was extremely necessary for the men who handled the trucks to have instruction in scientific loading. A poor job was made of this phase of the situation in nearly every instance noted, the biggest mistake being that articles which should have been placed first were put on last, necessitating much more unpacking work than otherwise would be necessary. As for numbers, the Blue army was composed of 6,500 enlisted men with officers bringing up the total to 7,500. Outside of the two armies were a large number of umpires and neutrals.

Each army had a general supply depot from which the supplies were carried to three or four secondary bases along the rear of the fighting line. From the secondary line to the camps conditions were apt to be anything from good hard dirt roads down to rough fields and thickets, but from the main depots to the secondary depots the traveling was mainly over hilly country with dirt roads. The baggage-carrying problem can be fully appreciated when this plan of action, which is typical of campaign work, is carried out. The main base of supplies is nearly always a railroad town. In these maneuvers such was the case. The Blue army had its base at Danbury on a branch of the New York, New Haven and Hartford Railroad; the Red army had its supplies at Derby on another branch of the same railroad. Carrying the baggage from the bases of supplies to the secondary bases is where the greatest work of the motor truck was done. It was in this work that they had the best success and showed conclusively that they had displaced the mule train in this field.

Followed the Soldiers

From the secondary bases to the field of operations motor trucks were also used to a great extent. A brigade of Massachusetts state militia in the Red army encamped a short distance from Sandy Hook had two White tru
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MOTOR EQUIPMENT OF THE BLUE ARMY

Truck	Organization	Size
G. M. C.	Quartermaster	5-ton
G. M. C.	Quartermaster	3½-ton
G. M. C.	Quartermaster	3½-ton
G. M. C.	Quartermaster	2-ton
Packard	Second N. Y. Brig.	3-ton
Packard	Second N. Y. Brig.	3-ton
Packard	Second N. Y. Brig.	3-ton
Packard	Second N. Y. Brig.	2-ton
Alco	Second N. Y. Brig.	3-ton
Sternberg	Second N. Y. Brig.	2-ton
White	Second N. Y. Brig.	3-ton
Packard	Provisional Art.	3-ton
White	Provisional Cav.	3-ton
Gramm	N. Y. Engineers	3000 lbs.
Saurer	N. Y. Engineers	4½-ton
White	Forwarding Hos.	1½-ton
White	Forwarding Hos.	1½-ton
Decatur	First N. J. Brig.	2-ton
Kelly	First N. J. Brig.	3-ton
Kelly	First N. J. Brig.	3-ton
Kelly	First N. J. Brig.	2-ton
Federal	First N. J. Brig.	2-ton
White	Both Armies	3-ton
Parhard	Headquarters	Pleasure car
Mitchell	Headquarters	Pleasure car
Cadillac	Headquarters	Pleasure car
Cadillac	Headquarters	Pleasure car
Franklin	Headquarters	Pleasure car
Hudson	Headquarters	Pleasure car
Stevens-Duryea	Headquarters	Pleasure car
Pierce-Arrow	1st Cavalry	Pleasure car
Lozier	2nd Cavalry	Pleasure car
Matheson	2rd Cavalry	Pleasure car
White	Umpire	Pleasure car
White	Official	Pleasure car
White	Official	Pleasure car

Compared with Mules

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through several villages

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have worked for practic
out any appreciable rest.
and often six or eight
it can be dragged
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pounds. A pack animal
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Average 48 Miles a Da

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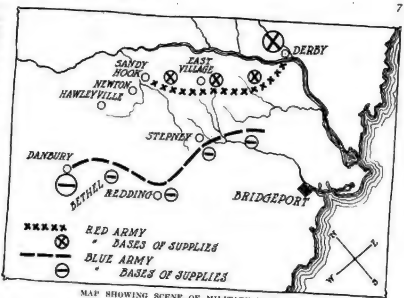
the fighting line, averaged 42 miles a day. The average gasoline consumption of these trucks was high, the mileage averaging 3⅝ to the gallon. The best truck proved to be the 1½ and 2-ton variety. These were all overloaded by at least 25 per cent and carried their burdens remarkably well. Where the 5-ton trucks were used, however, it was impossible for them to carry their designed load. One of the 5-ton trucks was so heavy itself that it became mired when only carrying sufficient tenting and food for a company.

Officers Enthusiastic

Colonel Bellinger, chief quartermaster, when seen at his headquarters at Camp Lee, Stratford, Conn., said: "I am firmly convinced that the army truck has come to stay. Where the roads are suitable it can not be superseded. I do not mean to state that it will ever entirely displace the mule, but in that part of the country where the roads justify it the motor truck is far superor to other forms of baggage-carrying apparatus owing to its speed, its less cost of upkeep than the mule and the fact that it never becomes tired, but will work as long as it has fuel and water. At present we have very few, but the war department intends to buy more."

This was the general opinion of the officers of higher rank through both armies. In some instances it was found that the commanders had expected too much of their trucks. This was notably the case with the Blue artillery encamped at Bethel, Ct. Three batteries of field artillery in this instance had depended on four 5-ton trucks to a considerable extent and had correspondingly cut down the number of mule and horse teams. These were too big. Early in the campaign, through faulty driving, one of these trucks became so badly mired that it had to be abandoned for 3 days. Another 5-ton truck could not be driven over a weak bridge, so the driver attempted to take it through the shallow stream to one side of the bridge. It rested in the bed of the stream for 3 days before it could be moved.



MAP SHOWING SCENE OF MILITARY MANEUVERS

Smooth Tires Fail

A mule team would have brought the truck through the stream readily, for the simple reason that the mule has traction in the mud, while the wheels of the truck, shod with smooth tread tires, spun around and could not take a grip. Too little attention was given the tires. Smooth treads were used when something that had more grip would have been far more practicable. When there is any wet weather at all the smooth tread tires cannot compete with the situation. Some form of mud hook or non-skid device is a necessity in wet weather.

Pneumatic tires or tires filled with some resilient compound are a necessity according to the majority of officers in the different quartermasters' departments. The Massachusetts brigade of state militia had two 1½-ton White trucks. These were identical except that one had the smooth-tread solid tires, while the other had dual pneumatics. The latter proved far better in the rough country work, as the vibrations were considerably less. This was the truck that the Massachusetts regiment was able to take directly into the field camp with it while in nearly every other instance the trucks had to be unloaded some distance from the spot in which the supply was needed and a detail of men was necessary to get the provisions into the right places.

Truck Replaces Railroad

There is another field of activity where the army motor truck stands supreme. In a country where the railroads do not penetrate near enough to the fighting lines the truck takes the place of the train. It renders it possible to have the main base of supplies a greater distance behind the firing line and hence renders the possibility of the capture of the base a remote possibility unless the defending army was entirely routed. As an aid to the quartermasters' department, if properly applied, it is invaluable. The 1½- and 2-ton trucks have proved superior, they are faster, can make more trips, can penetrate through narrow lanes, do not become mired so readily, can be 25 per cent overloaded for a short time without damage, and can equal the performance of the larger trucks in the way of carrying because the latter have demonstrated in this campaign that it is impossible for them to safely carry the designed load. The method of carrying provisions depends on the country to an enormous extent and the order in which the merits of trucks of different sizes may be graded depends on road conditions, but for all around effi-

WHITE TRUCK PROMINENT IN THE MANEUVERS

ciency and ability to deliver the goods on reasonable roads the light motor truck stands supreme.

WHITE TRUCK DELIVERING SUPPLIES TO QUARTERMASTER

For special work there is a large field. In the signal corps of the Red army there was one 3-ton truck. It was used entirely for the purpose of carrying around extra parts for the aeroplane scouts. This truck did excellent work because it was driven carefully. It was mounted on the regular 3-ton White chassis, but had a special open flare-board body built to army specifications. It always was where it was needed with its supplies and the commander of the aeroplane scouts said that it was exceedingly necessary for them to have another of the same type because there were other articles necessary to be transported from point to point for signal corps use and that it required the services of the one truck for the three aeroplanes. This left them no motor vehicle for other purposes.

Requirements for Hospital Work

Ambulance work offers a field which can be developed to a remarkable extent. According to the consensus of opinion of a number of army surgeons who were interviewed while in the field during the 8 days of manoeuvering, the main objection that they have seen has been the fact that the motor ambulances so far have not had sufficient carrying capacity. They become superior to the horse-drawn vehicle when they can carry more at the same speed. The motor ambulance should have a capacity of eight wounded; so far they have been adapted only for four. Along the battle line the wounded are picked up by the hospital corps attached to each brigade. This is accomplished by means of the stretchers which are attached to the ambulances. The wounded are carried back of the firing line and given temporary treatment when necessary. They are then placed in the ambulances and carried back to the field hospital which may be a distance of 5 miles behind the lines or practically any other distance, depending on circumstances. It is easy to see that the problem is to get back from the hospital for another load just as quick as possible and this is the strong point of the motor ambulance.

The ambulance car should be mounted on special springs. This fact has been amply taken care of in hospital cars for city work, but in field work the matter should go still further. If high speeds are to be reached without jar to the occupants the suspension of the ambulance will have to be made a special study. The ambulance needs plenty of power and should have, according to the experience of officers who have made a study of the problem, four speeds in order that any condition of the road can be met with successfully and when a high speed on direct drive is possible over a good road the situation can be taken advantage of.

Red Cross Conditions

In the present state of affairs a wounded man costs an army more than three dead men. The steel-jacketed bullets now in use leave a clean, small hole which does not kill a man unless it hits some vital spot, and since their use the percentage of wounded men has risen to an enormous extent. Anything that can cut down the cost of handling a wounded man will be invaluable to armies of the future and there is no reason that a properly designed motor ambulance can not do this. It cost $5 a day for an army to support a man and a pair of mules. If four mules are used to the ambulance, the outfit, including the driver, will cost $10 a day. What the cost of an ambulance car would be that could carry double the number—eight—wounded remains for future campaigns and designers of such vehicles to bring out. At present there are none of these availble.

TYPICAL SCENE IN MASSACHUSETTS MILITARY MANEUVERS

Handling Fuel Supply

The way the gasoline problem of these trucks is handled depends altogether on where a campaign is taking place. In the manoeuvres through Connecticut it was by contract with supply stations in the different towns. The trucks working between the primary and secondary bases of supplies required about 15 gallons of gasoline a day. On the last trip into town the truck would refill its tanks.

There were no cases where a separate fuel wagon was employed as might be necessary in a campaign through a country where the towns and villages were more scattered than they were during the manoeuvres. In an extended campaign the matter would have to be taken up in the same way as the rest of the supplies such as food and ammunition. The main base of supplies would be used as a central distributing point for the minor and movable bases, making two hauls to the front. Where an exceptionally large army is in the field it may even be advisable to have another subdivision of supply bases for gasoline in order that the motor vehicles working along the front will not have to travel a long distance to get to the source of fuel supply. As will be explained, there are always a number of motor cycles and pleasure cars in use along the front and it would be exceedingly expensive in time as well as in fuel for these cars to go a long distance to reach a point where they could take on more fuel.

There is no doubt that greater satisfaction would have been had with the motor trucks in the manoeuvres if they had been all specially adapted for army use. Nearly all the trucks in use were hired. The

PLEASURE CARS WERE USED BY THE OFFICERS

National Guard of New York, which was distributed between both armies, had twenty motor trucks of miscellaneous sizes. Out of these eighteen were hired; the remaining two were the Whites mentioned before. The Fourth Buffalo brigade of this organization had a 10-ton Pierce-Arrow truck which made the run from Buffalo to the field of action in 4 days. It did excellent work for its size, but had to be unloaded at every suspicious bridge, a condition that would have been disastrous in many circumstances which could arise in a campaign. The capture of a baggage train is the worst disaster that can happen to an army and a train of overloaded trucks belonging to a fast-retreating army would be the joy of any pursuing general's heart. Out of the eighteen miscellaneous sizes of trucks hired by the New York militia, the 1½ and 2-ton trucks here also did the best work. The 3-ton size seems to be the outside limit giving satisfactory results in this kind of country. Anything above can not carry the designed load.

Pleasure Cars as Officers' Mounts

The pleasure cars used in connection with the manoeuvres were a distinct success. Connected with the Red army headquarters were seven touring cars, while with the various brigades there were an ever-varying number loaned by friends of the officers. Attached to the chief quartermaster's headquarters in the neutral camp there were seven touring cars, of which five were hired or loaned and the other two, a Cadillac and a White, were the property of the war department. In the Blue army there were seven touring cars, also a Panhard, Mitchell, two Cadillacs, a Franklin and a Hudson. The field umpires also used a varying number of cars which were loaned for the particular occasion.

The greatest use to which the cars seemed to be put in the Connecticut mimic war was the transportation at high speed of the officers from one part of the field of operations to another. When used in this connection the speed at which the officers travelled averaged over 30 miles an hour on good dirt roads which traverse this part of the country. Aides could be carried from the staff headquarters to within reach of the battle line in a remarkably short space of time. There were very few if any horseback couriers at all in the entire campaign; the newer and quicker method of transportation seemed to have completely supplanted the horse.

Tires a Bugaboo

The only trouble that bothered the motor courier was the old bugaboo of tires. It might be that here the air-substitute man will have something to say, for a blowout on an emergency message woud render the trip slower in many cases than the horse could make it even if he cast a shoe along the way. Rough roads and fast work combined make the cost of tire mileage mount to an extraordinary great degree. An estimate on the cost of tire upkeep through the campaign work in Connecticut may be placed at 12 cents a mile where the car was driven well. Along the road it was possible to see many breakdowns and out of nine by count there was only one that was not due to a puncture or a blowout; the exception was a worn fan bearing bushing.

The motor cycle also was much in evidence for scouting purposes. In the Blue army a detachment of negro cavalry from the Tenth United States cavalry was sent forward to locate the enemy. Behind it were messengers on motor cycles who carried the reports of the scouts back to headquarters. For this work the motor cycle is successful. As far as having cycle brigades, however, the idea is not feasable because they are too difficult to transport over country where they cannot be used. Courier work on motor cycles was not carried out to the extent it should have been, the more expensive motor car being used in many cases where the motor cycle would have served the purpose just as well. For the carrying of messages the motor cycle is better than a motor car because it can get anywhere just as fast as a motor car can go, it is lighter on tires and is cheaper to run. For carrying officers from one point to another a motor car is necessary.

Army Mule Equipment

To what extent the motor apparatus can displace the horse and mule it is impossible as yet to state. At the present time the army regulations call for the following mule outfit:

	Mule teams
One regiment of infantry	20
One regiment of cavalry	31
One battery of artillery	13
One company of engineers	2
One company signal corps	2
One brigade-hospital corps	2
Attached to quartermaster department of a division	12

The capacity of the mule wagons is 3,000 pounds and they cannot stand much if any overload, especially since the supplies carried are of a very bulky nature. In all work where the hauls are of 20 miles or less and many trips can be made carrying a load of two tons at a time the automobile truck will displace four of the mule teams owing to its ability to return for another load while the mule team is out after it has made one trip. This would give the truck a run of 80 miles for the day, while the mule team would only go one way in this time, for a run of 25 miles in a day is the limit where the team is working day after day. The mule team

CITIZEN SOLDIERS UNLOADING TRUCK AT BETHOL.

SOLDIERS LOADING AEROPLANE ON TRUCK
MILITIAMEN PICK UP SUPPLIES FROM FREIGHT CARS

MAIS TRUCK USED IN TEST

would be compelled to make the trip 1 day, bringing the supplies, and go back the next day empty or with wounded men or whatever had to be taken back to the rear. When this is considered it is sufficient to place the mule in the list of obsolete army accessories for this kind of work. The motor truck has superseded the field train for hauling from the base of supplies and only in the very limited condition of impassable roads is it impractical to use the truck along the actual battle front.

The fact that so many of the trucks were hired at the last minute gave rise to the condition that every conceivable type was used. This was bad from the standpoint of carrying efficiency, but enabled the observers to make a close study of the merits of each. The big furniture and piano moving vans had too much body weight and could not be unloaded except through the back door, which made them exceptionally unwieldy. The openstake body and the regular prairie wagon style of army body proved the best for all around use.

Truck Needed for Wireless

The field telegraphers using wireless apparatus used horse wagons, but were nearly unanimous in the opinion that better work could be done with motor apparatus. There is room here for a specially-designed vehicle which will provide charging current for use in the wireless work. Telegraphers using the ordinary wire apparatus were confined in these maneuvers to cross country work almost entirely and neither mule nor motor vehicles were particularly adaptable for their purposes. A properly designed vehicle could be of benefit in wireless work.

With the Blue army headquarters there was one potential machine gun mounted on a touring car body of a Mitchell six. The gun was not there, and nobody but the umpires knew that the harmless appearing car was so equipped. It was not called into actual use during the campaign so that it is impossible to state what could be done with guns mounted in this way.

Summing up the entire situation it can be said that there never will be another campaign in which motor apparatus does not play an important part. The mule team never will be used for repeated long distances over good roads. That is a thing of the past. The motor army truck of the future will not be a converted furniture van, but will be especially adapted for army service. The average wagon will not have a capacity of more than 2 tons and very few, if any, will have a capacity of more than 3 tons. The 5-ton trucks are too heavy. Fast runabouts and touring cars will displace the horse for the use of aides-de-camp and the motor cycle will be a valuable asset in carrying reports from the scouts back to headquarters. From the Connecticut maneuvers the indications are that the army is gradually saying good-bye to its old standby, the mule.

ACCIDENTS SCARE INSURANCE MEN

Hartford, Conn., Aug. 17—Bertrand A. Page, vice-president of the Travelers Insurance Co. of Hartford, Conn., has just returned from the convention of the International Association of Casualty and Surety Underwriters, held at Fortress

COMMISSARY TRUCK REACHES NIGHT CAMP

A GENERAL MOTORS TRUCK

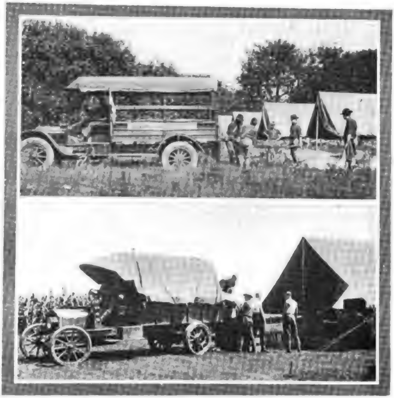
Monroe, where he read a paper on the question of motor accident insurance. He pointed out that because of the rapid increase in the losses due to motor car accidents, which in 1911 amounted to almost 22 percent of their totals, accident insurance men are becoming very much alarmed. He showed that in 5 years prior to 1906 motor car losses amounted to less than 3 percent of all losses, rising rapidly since then. To meet this the insurance men are considering higher rates or less liberal policies. Among other things he said:

"Ten years ago, roughly estimated, there were less than 100,000 pleasure motor cars in the United States and Canada. Today there are at least 900,000 in use. While the motor claims have been steadily on the increase, there has been no appreciable diminution in horse and vehicle accidents. The average amount paid for claims under this heading for the 5 years, 1902 to 1906 inclusive, was 10.4 percent of the total losses. In the year 1911 we find horse and vehicle accidents constituting 6.6 percent of the total in amount of claims, and motor car accidents 21.8 percent of the total.

"Indemnity claims from motor accidents May, 1906, to April 1, 1912, in the amount paid were in excess of the death losses during the same period; 548 claims were paid last year for cranking accidents alone. Of the 1,335 motor claims in 1911, 1,317 were for indemnity losses.

"Much has been said about the necessity for higher rates or a less liberal policy contract. With motor accidents constituting in the year 1911 about 22 percent of the claims in amount and over 10 percent in number, it would appear that the remedy for the situation lies in the securing of an adequate rate in connection with the insurance of those who use motor cars daily. It is unfair to charge the non-user for the claims incurred by his more exposed neighbor.

"Ten years ago there was practically no such thing as a motor accident. Last year, claims from select, preferred and ordinary class risks were increased by automobile accidents 28 percent, and this does not take into account horse and vehicle accidents caused by motor cars, nor injuries to pedestrians and persons on bicycles, motorcycles, etc., who were run over or into by cars. During the past few years the motor car has been the big factor in increasing claim loss ratios, although unwarranted liberalizations in the policy contract have not been without their effect."



SOLDIERS PUTTING WOUNDED MAN IN AMBULANCE
NATIONAL GUARD TRUCK GETTING FOOD FROM MESS TENT

SEVENTY-FIRST REGIMENT AND TRUCKS LEAVING CAMP

RAIN MARS MISSISSIPPI TEST

Greenville, Miss., Aug. 20—Rains, which delayed the A. A. A. reliability tour's pathfinder, contributed to the failure of Memphis Automobile Trade Association's endurance test. Of the twenty cars that entered only five reached Greenville, the others returning after the heavy rains began. Two Cadillacs, an Overland, a Studebaker 20 and a Hudson pulled through the mud to this city.

BUFFALO MOTORIZING

Buffalo, N. Y., Aug. 19—Motorization of the entire Buffalo fire department is to take place within a short time, according to fire commissioners of that city. Buffalo is to receive its second motor combination chemical and hose wagon from the Victor Motor Truck Co. on Saturday of this week and now that city is planning to add a motor-driven aerial hook and ladder truck to its fire equipment.

Vanderbilt Aid Inspects Race Course

E. G. Williams Declares Milwaukee Has Circuit of Great Promise—Work of Surfacing Roads Starts—Brewers Counting on Sixty Entries in Four Events—Gossip

MILWAUKEE, Wis., Aug. 20—William K. Vanderbilt, Jr.'s personal representative, E. G. Williams, inspected the course being prepared for the four big motor classics to be run under the auspices of the Milwaukee Automobile Dealers' Association on September 17, 20 and 21, and returned to New York on last Saturday full of enthusiasm and highly gratified over the selection of the roads and the progress of the work of reconstruction.

"It is fine," was the expression of Mr. Williams after being hauled over the 8.2 mile course. "It is much better than the Greenfield course you Milwaukeeans first thought of using for the big races. Those two 3-mile straightaways will add a touch of the real sport of motor racing, and I think some new marks will be hung up if the course proves as fast as it looks today. One of the best features of the roads you have selected is that high speed can be maintained throughout its length, for your turns are wider than the rule and of such shape and dimensions that drivers will not have to slow down to the extent that they do on less safer turns on other courses."

Surfacing the Roads

The work of surfacing the roads with a 70 per cent asphaltum composition with screenings began on Monday morning. A. B. Chamberlain, of New York, who has the contract for oiling the course, arrived on Saturday and has already organized his crews. The first oil has been applied on the Town Line road, the upper or north leg of the course, but the bulk of the work will await a thorough drying of the surface, following heavy and continuous rains.

During last week there were showers on all but 1 day, and this condition has interfered slightly with the progress of the road work. However, before the contract was taken, allowances were made for exactly such conditions, and the completion of the work will not be delayed 1 day unless some serious situation should arise which cannot be discerned at this time. One week from Saturday the course will be ready for the space-eaters. The drivers already entered for Milwaukee who will be seen at Elgin will beat it from the Illinois course to Milwaukee and find the course ready for preliminary practice when they arrive.

Many Visitors at Course

It has been necessary for the M. A. D. A. to hire a corps of special policemen to patrol the course and keep visitors from annoying the road construction crews with lengthy conversation and delaying the work by continual running over the roads and back. The course is so close to the city that on a Sunday afternoon it is impossible to drive a car onto any point on the course.

It is likely that no definite idea of how many cars and drivers will run in the four events at Milwaukee until the Monday following the Elgin meet. It is known, however, that sixty cars already have been nominated, meaning that each field will average fifteen cars. The light classes, the Pabst Blue Ribbon and Wisconsin Challenge trophy events, are being well filled, the extra large cash purses and the cups being an inducement.

Locating Start and Finish

Manager Ruddle, Chairman August A. Jonas and the race committee planted the first stakes for the location of the start and finish line and the grand stands, official stand, pits, press tower and other buildings, late last week and the carpenters are playing the anvil chorus from early morning until late at night. The layout of the stands is claimed to be an improvement over anything yet tried for road races. The grandstand is being offset so that the watchers may get a better view of "car coming." The pits are opposite the official stands and directly in front of the grandstands, separated from the box sections by a promenade.

Racing camps already are being selected by team managers. The first on the ground was Hughie Hughes, the Mercer pilot, who is going in at least three events, the Pabst, Wisconsin Challenge and Vanderbilt. It will be a 3 weeks' outing in the country for some of the racing teams, as the ground around and within the course is in many spots most beautifully wooded, away from the dust and grime of the city but close enough for convenience.

The advance sale of seats for the road carnival is most gratifying and there is every reason to believe Milwaukee will come out of the meet without loss.

M. C. A. HOLDS MEETING

Detroit, Mich., Aug. 18—The regular mid-summer meeting of the general rules committee of the Manufacturers' Contest Association was held on Thursday, August 15, at Hotel Pontchartrain, Detroit. At this meeting suggested changes in the contest rules were discussed to be later recommended to the contest board of the American Association for adoption.

Never before since the M. C. A. was organized in 1909 have there been fewer suggestions regarding changes in the rules. This is good proof that the contest regulations of the past year have worked out to the satisfaction of every one in nearly all cases.

In order to obtain the sentiment on contest matters among manufacturers in general, regardless of membership in the M. C. A., a set of questions was recently sent out to 130 different concerns. In all of the answers received only one was not enthusiastic over the good the association has accomplished during its existence.

The answers also showed a unanimous belief on the part of makers that contests in this country should be regulated as in the past. Sentiment regarding stock and non stock competitions was about evenly divided.

Other matters of routine nature were discussed, including the future of contests, especially those in which the commercial vehicle will figure prominently.

TRANSCONTINENTAL ALCO CREW CAMPED NEAR MEDICINE BOW, WYO.

Peugeot Sending Race Team to America

Three French Cars Now on Atlantic Accompanied by Drivers—E. C. Patterson and R. J. Collier Enter Two of Them at Elgin and Also Will Drop Them in at Milwaukee

CHICAGO, Aug. 21—Peugeot, winner of the French grand prix, will contest for racing honors in America, with its first appearance in the Elgin road races of August 30-31, in which it will be entered in the Elgin National Watch Co. trophy race and the free-for-all. From Elgin the team will jump to Milwaukee for the grand prix and Vanderbilt cup races.

A cablegram received by Paul Lacroix, American representative of the Peugeot, announced Monday that the three cars that raced in the French grand prix were already on the water, accompanied by three drivers, with the intention of taking part in the American road races. It is anticipated that they will reach New York Saturday and be shipped immediately to Chicago, reaching Elgin on Tuesday, which will give a couple of days for practice. Just who the drivers are is not known, but it is anticipated that they are Boillot, winner of the grand prix, and Goux and Zuccarelli.

Following this cablegram, E. C. Patterson, of Chicago, and R. J. Collier, of New York, who started the movement to import the Peugeots, agreeing to be sponsors for them in the American races, made four entries in the Elgin road races—each being represented in two races on the second day. The third car also will be entered by Mr. Patterson as soon as he is notified by Mr. Lacroix that this can be done. These entries are made provisional on the cars getting here in time, which seems most likely now. If the cars race at Elgin both Mr. Patterson and Mr. Collier will enter them at Milwaukee also.

The French dressing given the Elgin races adds greatly to the international flavor of the big contests which are being promoted by the Chicago Automobile Club and the Elgin Automobile Road Racing Association, for already nominated are the Fiat of Italy, and the Benz and Mercedes of Germany, while the American representation consists of the Knox, National, Stutz, Mercer, Mason, Falcar and Herreshoff.

The roll call of drivers engaged shows a rare lot, consisting of the French trio, Teddy Tetzlaff, Erwin Bergdoll, Ralph Mulford, David Bruce-Brown, Hughie Hughes, Spencer Wishart, Harry Endicott, Len Zengel, Billy Knipper, Charley Merz, Gil Anderson, George Clark, Neil Whalen, W. G. Wordingham and several others. In the case of Bruce-Brown, his starting hinges on his closing a deal with E. E. Hewlett, of Los Angeles, for the same Fiat which he drove at Savannah last fall. Bruce-Brown's car which he drove in the French grand prix was not shipped from Italy until today, so there is no chance of it getting here in time. As Hewlett has all three of his cars at Elgin now, there seems to be no doubt but what he will come to terms with the two-time winner of the American grand prix.

Work on the course is progressing rapidly and unless it rains the rest of the week, which seems unlikely, it will be in shape by Saturday. Practice, however, will not start until Monday. Several of the camps already have been established, the Fiat, Mercer and Mason being here already.

EUROPE READY FOR ANOTHER RACE

Paris, Aug. 10—The second edition of the grand prix race will be held near Le Mans on Monday, September 9, under the control of the Automobile Club of the Sarthe. Sixteen entries have been received, the cars being three Lion-Peugeot, four Schneider, three Arrol-Johnston, three Calthorpe, two Crespelle, and one Bugatti. Owing to an error the foreign entry blanks gave the date of closing as August 15; it is thus possible that other English cars will be seen in the race at Le Mans.

The race is open to cars having a cylinder area of not more than 3 liters, or 183 inches, there being no restriction as to weight. The distance will be about 450 miles over a short, fast course. The Lion-Peugeots are the models built for the Dieppe race, and are practically replicas of the big car which won that event. They will be driven by Goux, Zuccarelli and Rene Thomas. Three of the Schneiders are poppet-valve models similar to those competing at Dieppe and in the Belgian grand prix. The fourth is the firm's 1913 type of valveless motor, which was built for the Dieppe event, but had to be kept back owing to lack of preparation. Bugatti, who has a high reputation in Europe, has built one 3-liter car, declared to be exceptionally fast, and which will make its debut in the races at Le Mans.

Several requests having been made for an unlimited powered class, it is quite possible that the committee will decide to create one. If this is done, Wagner's Fiat, which finished second at Dieppe and has been bought by an amateur, will be entered; the Dietrichs also will be entered and Mercedes entries are promised for such a race.

If the big-car race is decided on, all cars will run together, but the 3-liter models will be given sufficient start to assure the finishes taking place at about the same time.

BURMAN RACES AT ALBANY

Albany, N. Y., Aug. 19—Bob Burman in his Blitzen Benz raced 1 mile in 1:12⅘ on the two-lap track at Parr's Island here Saturday afternoon before 5,000 spectators. Summaries:

Three miles, Albany drivers—Dodds, Stutz, won, time 5:40; Earle, Jackson, second; Cannon, Cole, third.

One mile, for record—Burman, Blitzen Benz. Time, 1:12⅘.

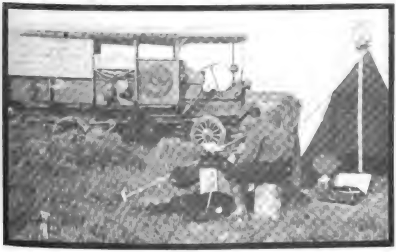
Three miles—Burman, Cutting, won, time, 4:09⅗; Kyle, White, second.

Three miles, non-stock—Burman, Ohio, won, time 4:20; Kyle, White, second; Hickman, Mercedes, third; Grennon, Benz, fourth.

Three miles, non-stock—Burman, Cutting, won, time 4:07⅘; Kyle, White, second.

Three miles, non-stock—Burman, Ohio, won, time 4:18⅗; Hickman, Mercedes, second; Kyle, White, third; Grennon, Benz, fourth.

Three miles, non-stock, free-for-all—Kyle, White, won, time 4:45⅖; Burman, Cutting, second; Hickman, Mercedes, third.



CAPTAIN E. L. FERGUSON IN COMMAND OF ALCO TRANSCONTINENTAL RUN

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Lack of Stock Car Contents

CONTESTS this year have been characterized by the few stock car events scheduled. This has been due to the lack of activity on the part of the Manufacturers' Contest Association and the Contest Board of the American Automobile Association in pushing the stock car program. During the past winter a general spirit of discontent was engendered in certain contest circles with stock car events on the ground that car makers did not want them and would not support them. The stock car event was blamed generally for everything from the lack of entries in a reliability run to the low ebb of interest in a track meet. The last few months have proven that the lack of interest in many contests has not been due to stock car restrictions, because where the stock car clauses have been cast aside and free-for-all stipulations used instead there has not been any improvement in the entries or in the interest. In not a few events the tide is turning again to stock products and there has been a healthy inquiry for stock car registrations and stock car events.

NOT a few makers argued that stock car events would not endure because as soon as one maker established the greater speed or reliability of his machine over that of his rival that the defeated party would refuse to compete further. The same has proven true in the free-for-all field and it has been demonstrated within the last month or 2 that when a maker of a free-for-all car gets emphatically defeated by a rival he refuses to enter in other events until such time as he can get a new model out with which he hopes to win. The fact is that stock car racing will endure longer than free-for-all types with the car maker and in this light it must be remembered that much of the racing of this year is not manufacturers' racing at all, but merely racing by enthusiasts who have bought fast machines and engaged drivers to pilot them. These enthusiasts are not in anywise interested in the car from an advertising viewpoint, but solely from a sporting point, the result being that but a very small percentage of the 1912 racing has been backed by the car makers or represents honestly the products that are being marketed today. As a result the racing of this year means little to the spectator who attends with a view of studying the relative merits of the competing cars. Over 50 per cent of the machines are models that never have been on the retail market and the other 50 per cent are of models that incorporate a few stock parts but which are largely made up by the driver's conceptions of what a racing machine should be. Imported parts figure in not a few machines of domestic manufacture and practically all of the foreign machines contesting are special racing models.

UNFORTUNATELY, all of the free-for-all events in the racing field do not aim at drawing attention to any particular phase of car construction. The free-for-all event is the one with the big money prizes and there is not a restriction in these cars. There is not anything that would aid in making car construction better or that would point the way to new features of design. It is merely a misdirected effort with brute strength by way of cylinder size as the only recognized factor. Control of motor sizes and judicious direction by way of restrictions is needed more today in racing than ever before.

Adding Car Weight

MOTOR cars are not so light as they were last year or even the year previous to that. Although country-wide talk has been to make cars lighter and so reduce tire cost as well as general maintenance cost the weight has constantly been rising due to a variety of causes. Bodies are generally larger, being wider, longer and often deeper. In some makes as much as 4 or 5 inches have been added between the dash and the front edges of the front seat; similar amounts have been added in the tonneau. The seat cushions are deeper, the upholstery is heavier and weight added in not a few other ways.

CONSUMERS have demanded demountable rims and in several cars where two extra demountables with complete tire equipment on them are carried the weight added to the car amounts to over 200 pounds. The tops fitted by several makers are heavier and more enduring than those previously fitted. not a few makers are adding trunk racks as general equipment. Scores of makers are adding self-starters, some compressed air, which call for a larger air reservoir, a system of piping and in some cases power-driven air pumps; those using electric systems have added motor-generators in some cases exceeding the 100-pound mark in weight and in addition a heavy battery is added. Gas starters add weight, as do mechanical types. The windshield equipment is now more common; and added to these are tire chains, speedometers, clocks, a full side curtain equipment and many other features, all of which bring the car weight up.

WITH many cars the tire equipment has not kept pace with the increase in weight and often the weights published by the manufacturer are for the car without equipment and while the tires are adequate for the car in such stripped form they are entirely inadequate when the hundreds of pounds of equipment are put in place. A Motor Age subscriber recently was impressed with the rapid wear of his tires and had his car weighed in its touring form to discover if it was under-tired, which led to the discovery that the car weighed over 600 pounds more than the weight announced by the maker and was entirely under-tired. The experiences of this subscriber would be duplicated in thousands of cases throughout the country if the owners would only take a few minutes and have their machines weighed, in full touring form with gasoline tank filled, extra rims and tires, robes, tools and all other requisites. The car should be weighed empty with both front and rear wheels on the scale platform and should also be weighed with the front wheels resting on the middle of the scale platform and the rear wheels off the platform, followed by weighing with the rear wheels on the platform and the front wheels off. This weighing program can be duplicated with the touring load of four or five passengers. When so weighed the owner should check the load on each wheel with the permissible load for the tire size as stipulated by the tire maker whose tires are used on the car. It is almost certain that in over 50 per cent of the cases the tires will be found to be overloaded.

Hingham Abolishes Its Speed Traps

Massachusetts Town Insists Upon Uniformed Police Officers

BOSTON, Mass., Aug. 17—As a result of a crusade backed by the Hingham Motor Club, assisted by a citizens' committee, all motor owners, who called a special meeting and without mincing words attacked the plan of Chief of Police James in conducting motor traps, the selectmen of the town voted unanimously to instruct the chief to abolish them and in their stead place his officers in uniform on the streets to direct motor traffic. One of the effective rods used also was the editorial of Miss Floretta Vining, owner of the Hull Beacon, who criticized the police force in these words:

"Motor car traps are to be a thing of the past in Hingham. The selectmen have unanimously voted that the chief of police shall discontinue them, and as they appoint him to office there is no reason why they should not see that this is carried into effect at once or else get a new chief that will respect the wishes of the people. There hardly is a citizen in town who does not want to see the heavy traffic on our streets on a Sunday regulated as it should be by traffic policemen in uniform, and why any public servant should so insistently disregard the wishes of the people who pay him his salary, and continue a practice which is obviously objectionable to all the best people in town, and in direct violation of the vote of the selectmen who appoint him to office, it is hard to conceive. Our police force is in the best shape it has ever been in its history, and the men make a fine appearance when dressed in their uniforms. This is largely due to the work and management of Chief James, who took charge of the force when it was a joke and has brought it up to its high state of efficiency. The one blot upon its record has been its persistent persecution of motorists, bringing disgrace upon the town, and making Hingham one of the last towns in New England to do away with the trapping system. With this notoriously disagreeable habit thrown into the discard, and with the chief and his men regulating the traffic, which will be in keeping with the manly and businesslike appearance which they make when on the street, Hingham's police force will be a source of congratulation and credit to every citizen of the town."

THE LATE H. F. DONALDSON

DEATH OF H. F. DONALDSON

New York, Aug. 15—Henry F. Donaldson, president of the Society of Automobile Engineers and member of the firm of Donaldson & Tracy of this city, consulting engineers, was found dead in his apartments in this city today, death having occurred 2 or 3 days earlier, due to a bullet wound in the left breast and also in the temple.

Mr. Donaldson was a pioneer in trade press publication work in America, having entered the field of marine engineering publications work years ago. He was at one time editor of the Automobile and was editor and part owner of the Commercial Vehicle until last fall when he disposed of all of his holdings just previous to the European visit of the Society of Automobile Engineers, on which trip he was a leader. He remained abroad for several weeks after the return of the other members of the party and on his return busied himself with laboratory work connected with his firm of Donaldson & Tracy and also devoted his energies to the Society of Automobile Engineers, of which organization he was elected president at the January meeting. After his election he proved one of the most active presidents that the society has known and devoted much time pushing the various activities of the organization. Mr. Donaldson was 45 years old and one of the highest respected citizens of the motoring field. As a consulting engineer his estimate of a problem was accepted as an authority. The council of the Society of Automobile Engineers met today and passed the following resolution on the death of President Donaldson:

> Resolved, That the Society of Automobile Engineers, through its council, greatly deplores the death of its president, Henry F. Donaldson, whose capable and energetic work for the society during the past year is widely recognized and who was respected and beloved by all of his associates for those brilliant attainments of mind and sterling qualities of manhood that raised him above the ordinary level of mankind, making him a natural leader and an unwavering advocate of that which was right and noble and generous; and be it further
>
> Resolved, That the society extends its deepest sympathy to his immediate family and other relatives in their grief over their great and irreparable loss.

Coming Motor Events

August 25—Track meet; Columbus Auto Club, Columbus, O.

August 25-28—Short distance race; Boulogne-Sur-Mer.

*August 30-31—Elgin road races; Chicago Automobile Club; Elgin, Ill.

September 1-3—Ostend meet.

September 2—Track meet at Winnipeg, Canada.

September 3-6—Chicago Motor Club's truck demonstration.

September 8-25—San Sebastian Rally.

September 9—French Grand Prix; Le Mans, France.

*September 9-12—Commercial vehicle run; Chicago Motor Club.

September 11-14—Third annual reliability run of Automobile Club of Buffalo, Buffalo, N. Y.

September 14-21—Annual fall show; Chicago Automobile Trade Association.

September 17 — Grand Prix; Milwaukee, Wis.

*September 20—Wisconsin challenge and Pabst Trophy races; Milwaukee, Wis.

*September 21—Vanderbilt road race; Milwaukee, Wis.

September 17-20—Fire engineers' convention; International Association Fire Engineers, Denver, Colo.

September 25-October 6—Agricultural exhibition and plowing matches; Bourges.

September 30-October 5—American Road Congress; Atlantic City.

September—Track meet; Universal Exposition Co., St. Louis, Mo.

October 4-5—Track meet; Sioux City Auto Club, Sioux City, Ia.

October 6—Gaillou hill climb.

*October 7—National tour Detroit to New Orleans; American Automobile Association.

*October 7-11—Chicago Motor Club reliability run, Chicago.

October 12—Track meet; Rockingham park, Salem, N. H.

October 24-25—Banta Trophy Team match, Chicago Motor Club.

November 2-3—Splash guard competition; Versailles.

November 6—Track meet; Shreveport Automobile Club, Shreveport, La.

*Sanctioned by A. A. A.

SHOWS

September 23-Oct. 3—Rubber show, Grand Central palace, New York.

September 26-Oct. 6—Exposition agricultural motor cars, Bourges, France.

October 2-12—Fire show, Madison Square Garden, New York.

November 8-16—Olympic show; overflow November 22-30 Agricultural Hall.

December 7-22—Paris salon.

January 6-11, 1913—Cleveland show.

January 4-11—Montreal show.

January 11-18—New York pleasure car show; Automobile Board of Trade; Madison Square Garden and Grand Central Palace.

January 11-22—Brussels, Belgium show, Centenary Palace.

January 20-25—New York truck show; Automobile Board of Trade; Grand Central Palace and Madison Square Garden.

January 20-25—Philadelphia show.

January 27-Feb. 1—Detroit show.

February 1-8—Chicago show.

February 10-15—Minneapolis show.

February 17-22—Kansas City show.

March 3-8—Pittsburgh show.

March 8-15—Boston show.

March 17-22—Buffalo show.

March 19-23—Boston truck show.

March 24-29—Indianapolis show.

Shortage of Freight Cars Threaten

Railroad Issues Warning to American Motor Industry at Large

CHICAGO, Aug. 19—Prospects of a serious car shortage during the coming winter are imminent and threaten to tie up shipments of motor cars and accessories to a more serious extent than during the past few years. All the railroads are looking forward to an enormous quantity of traffic and believe that their facilities will be taxed to their utmost during the next few months.

The American Railway Association's record shows a decrease of 12,412 in the available cars during the past 2 weeks, and the season of the heavy crop movement is just beginning. Motor car makers along with other shippers can do much toward relieving and preventing the threatened shortage by following three simple rules:

Load cars as soon as possible after being placed.

Load cars as near capacity as possible.

Hurry unloading of cars to make another empty.

The Pennsylvania railroad has instructed all of its freight solicitors to urge shippers to assist the railroads in their efforts to prevent any car shortage. The importance of prompt loading and unloading of cars is being impressed upon shippers, who also are being asked to cooperate with the railroads to prevent any congestion of traffic. The Pennsylvania, in pursuance of its policy in such cases of taking early steps to preclude, if possible, any likelihood of a car shortage on its lines, is advising its patrons to have freight ready for loading when cars are placed on sidings, and is urging them to load all cars as near to capacity as practicable, in order to get the greatest possible service out of each car used.

The prediction by the Pennsylvania of a heavy fall traffic is especially interesting at this time, following, as it does, a statement just issued by W. A. Garrett, chairman of the Association of Western Railways, in which he makes an appeal to industrial traffic managers and commercial organizations. Mr. Garrett says:

"The time is here for the railways and shippers of the United States to begin active and energetic preparations to prevent a car shortage. The indications are that if they do not begin such preparations at once they will be confronted next October with the worst situation that has existed since October, 1907, just before the panic. No railway man or shipper needs to be told what that situation was. Railway facilities were inadequate to move the business. Yards and terminals were congested, and heavy loss to the railways, the shippers, and the public resulted.

"Conditions that are likely to cause a heavy demand for, and a rapid reduction in the supply of cars exist today. The amount of traffic handled varies greatly during different parts of the year. During about 4 months, beginning around October 1, there are apt to be shortages. This is owing chiefly to the fact that that is the season of heaviest crop movement. Now, the crop prospects in the west this year are unusually good. That helps to make the prospect of a car shortage unusually bad.

"If the bad situation now threatening is to be averted, the managers of the railroads must have the hearty support and co-operation of the shippers and consignees of the country. The shippers and consignees can give such support and co operation in at least two ways: By moving all lumber, coal, cement, and other freight that they can within the next few weeks, instead of delaying and throwing it all on the railways when they are staggering under the crop movement.

"Shippers and consignees can greatly help themselves, the railways and all other shippers and consignees, by loading and unloading all cars delivered to them as expeditiously as practicable. Every time the loading or unloading of a car is needlessly delayed, the available supply of cars is needlessly reduced; and no shipper has any right to complain that he is not furnished enough cars, if he is, by his own acts, needlessly and wrongfully reducing the available supply of cars. Commercial organizations cannot render a better service to their members than by urging on them the need for prompt loading and unloading. Cars are furnished for transportation, not for storage; and every one used for storage reduces the number available for transportation.

"There has been a great deal of talk in recent years about the need for better co-operation between railways and shippers. Here is a matter regarding which they can heartily and energetically co operate to the very great gain of both."

TO INVESTIGATE PATENT OFFICE

Washington, D. C., Aug. 17—The passage to the senate this week of the Bulkeley joint resolution providing for an investigation of the patent office means that from now till December President Taft's economy and efficiency commission will be engaged in going over the patent office with a fine-toothed comb. Dr. F. A. Cleveland, chairman of the commission, estimates the investigation will cost $10,000. First, a descriptive report, in detail, of the administration of the office, including present methods, personnel, equipment, building, etc., will be prepared. Hearings will be conducted, at which what Dr. Cleveland calls "the critical and constructive of members of the patent bar, pate officials, etc., will be ascertained. T of the work of the commission w sist in digesting the information t tained and preparing for congress mendations as to changes in law, i in appropriations, additional buildi

The patent office has done excelle for the industries of the count some respects it is behind the tim as to methods and equipment. Its are large enough to provide for oughly up-to-date office and organ while the laws governing the grant working of patents should be rev meet the demands of modern busine

The work of the commission watched with more than ordinary by the motor car and accessory in which contribute thousands upon th of dollars to the coffers of the gov every year in patent fees.

RAIN HELPS NEBRASKA CR

Omaha, Neb., Aug. 19—Recent rains throughout the whole of N are causing the most optimistic among the dealers of Omaha. M who were out in the state last w ported that they believed that the corn would be 30 percent larger tha last year. Winter wheat, also, on big Nebraska crops, is running as bigger than last year. Because of dealers anticipate a heavy fall t motor cars. They figure that the backed by their heavy crops, will b field strong. Some of the local experiencing difficulties in getting models rapidly enough, and the been repeated demands at the sal for information as to when the c arrive.

TWELVE IN PLOWING MAT

Paris, Aug. 10—For the motor competition to be held at Bou October 1, 2, and 3, by the Au Club of France and the Central bile Club, twelve entries have ceived, two of these being from firms—the Case company and th national Harvester Co. The competitors are Bajac, Dulin, P ter Gilbert, Hubert-Linard, Lefebre, and Vermond Quellence machines. In the motor-driven bi tion there are three machines, them being entered by the Ban pany and one by De Mesmay.

The Bourges event is not n plowing competition but one of gest demonstrations of the applic the internal-combustion motor culture that has yet been held in It will comprise a display of st motors driving various kinds of

Mais Plant Sold, Company Reorganized

tural machinery, motor trucks for the use of farmers, various competitions for farm mechanics, and a motor fair, this latter being worked on the same lines as the old horse fairs. Every kind of second-hand motor vehicle and accessory will be admitted to the fair, the object of which will be to give agriculturalists an opportunity of securing second-hand machines and accessories at a reasonable price.

CANADIAN RAISES LEGAL POINT

Kerrisdale, B. C., Aug. 17—The interesting defence of J. A. Russell, counsel for R. L. Plumpton, that there is a legal distinction between the speed of a motor car and the rate of speed is to be made the ground of an appeal against the conviction registered against Mr. Plumpton by Reeve Harvey, of Point Grey, recently Decision to appeal the case was reached and the transcription of evidence and the preparation of papers are now being proceeded with.

The point raised by Mr. Russell was that in relation to speed on city, town or village streets, the act specifies that a "greater rate of speed than 10 miles an hour" may not be exceeded, but in the open country the act specifies that no car shall run "at a greater speed than 25 miles an hour." Mr. Russell contends that in the former case the "rate of speed" means that the "rate" at which a motor was traveling might be timed for a short distance, but that in the latter case, where the word "rate" is not mentioned, the timing of a motor would have to be carried out for a space of 1 hour before the wording of the act could be complied with.

In the trial at the Point Grey police court the evidence for the prosecution was supplied by constables who had measured the speed of the car over a measured distance of 220 yards, from which they calculated the speed as being 34 miles an hour.

Mr. Russell argued that the speed "per hour" could only be calculated on an hour's actual running. Reeve Harvey, who presided, ruled against Mr. Russell's argument and fined Mr. Plumpton $10 and costs.

SUES ATLAS ENGINE WORKS

Indianapolis, Ind., Aug. 18—Suit has been brought in the circuit court in Indianapolis by the Minnehaha National Bank of Sioux Falls, N. D., against the Atlas Engine Works of Indianapolis, which is in the hands of a receiver. The action, also directed against Hugh H. Hanna, president of the Atlas works and the United States Fidelity and Guaranty Co., is to collect a judgment for $2696, upheld by the Indiana appellate court last April.

F. H. Wheeler Prominent in Big Indianapolis Motor Truck Deal

INDIANAPOLIS, Ind., Aug. 19—Only one bid was submitted for the purchase of the Mais Motor Truck Co. today and the property was sold by the receiver, Franklin Vonnegut, to Frank H. Wheeler of Indianapolis and Walter N. Pearce and H. G. Francis of Rushville. The purchase price is $71,000 and the sale, of course, is subject to the approval of the court, which is in vacation. Mr. Wheeler declines to give any details as to the future of the company until the sale is approved by the court. Mr. Francis and Mr. Pearce are stockholders in the old company. Mr. Wheeler will control about 50 per cent of the stock.

Besides getting the plant and equipment, the purchaser will get about $12,000 in accounts and $10,000 in notes receivable. One-third of the sale price is to be paid in cash; one-third in 12 months and the remaining one-third in 18 months.

The receiver filed the following inventory in court: Finished stock, including two shop cars and parts in assembly, $26,759.32; car parts, now in process of machining, $6,327.89; car parts in the rough, consisting of rough castings and all unfinished parts, $19,481.55; bar steel, brass and steel tubing, $7,887.17; machinery, $55,236.82; factory equipment and supplies, including all belts, pulleys, motors, starting boxes, etc., $10,778.53; office equipment, $2,784.05; paints, oil, etc., $460.56; patterns, manufacturing cost, $7,804.36; jigs and tools, manufacturing cost, $13,439.67, and real estate and buildings, $30,000. Total $150,959.92.

The receiver expects to have approximately $85,000 to divide among the creditors. The liabilities of the company are said to amount to approximately $250,000.

Following the sale, the Mais Motor Truck Co. was reorganized and incorporated with $1,000,000 capital by the purchasers of the property. Mr. Wheeler, who will hold one half of the stock, is now president; Walter M. Pearce, of Rushville, is vice-president; Alvin S. Lockard, Indianapolis, secretary and treasurer. Will H. Brown, former president, will continue with the company. The officers and Jacob V. Stimson, Huntingburg, and Harry G. Francis, Rushville, will constitute the board of directors. Most of the old stockholders are in the reorganization. The stockholders in the old company will realize nothing. The new company assumes a $10,000 mortgage on old plant, besides paying $71,000.

WESTINGHOUSE SUIT SETTLED

Philadelphia, Pa., Aug. 16—The legal hostilities between the Louis J. Bergdoll Motor Co. of this city and the Westinghouse Machine Co. of Pittsburgh were finally adjusted and settled, announces the Bergdoll company, when full satisfaction was entered yesterday on the records of court of common pleas No. 4. In May of 1910 the Westinghouse company contracted to build for the Bergdoll company 1,000 gasoline motors to be delivered at the rate of not fewer than 100 per month. After receiving and paying for 600 of the 1,000 motors the Bergdoll company declined to receive or pay for the balance, alleging as its reason failure on the part of the Westinghouse company to make deliveries as agreed, and consequent losses in sales of cars in the construction of which the motors in question were to be used. As a result the Westinghouse company brought the above action. By the terms of settlement the balance of the motors are to be shipped to the Bergdoll company as its needs require.

FALL SHOW IN CHICAGO

Chicago, Aug. 19.—Plans have been made by the Chicago Automobile Trade Association for its annual fall festival which has been scheduled for the week of September 14-21. In reality this is to be a street show, with Michigan avenue lighted at night, all the stores decorated and the 1913 models on view. As attractions there will be parades and other affairs which will bring out the prospects. The opening night there is to be a parade of commercial vehicles, which will include those machines which have taken part in the Chicago Motor Club's demonstration, which has been scheduled for September 10-13. On Monday night there is to be a parade of electric vehicles. On Tuesday, fire prevention day, there is to be a display of municipal motor vehicles. Old cars will parade Wednesday.

FISHER BUYS ESTERLINE CO.

Indianapolis, Ind., Aug. 21—Carl G. Fisher and James A. Allison, of the Prest-O-Lite Co., of this city, have purchased a one-half interest in the Esterline Co., Lafayette, Ind., manufacturers of the Berdon electric lighting system. The price paid is $150,000. The other half of the new organization is in the hands of the original owners of the company who traded in the original company for $75,000 and put in $50,000 additional cash. The former management will be continued and it is expected that Messrs. Fisher and Allison will occupy nominal positions in the reorganization, which will be completed this week.

Orders have been booked for over $1,000,000 worth of Berdon lighting apparatus for the 1913 season. The present officers are: J. Walter Esterline, president; E. S. Ferry, vice-president, and W. Bent Williams, secretary-treasurer.

Marmon Winner of Winnipeg Reliability

Clean Score This Time Gives Car the Minneapolis Journal Trophy

MARMON, PERMANENT WINNER OF MINNEAPOLIS JOURNAL TROPHY

MINNEAPOLIS, Minn., Aug. 17—With the Marmon entry, No. 1, victor in the touring car class and winner permanently of the Journal trophy, the fourth annual tour of the Minnesota State Automobile Association, its first international tour and most eventful run of its history, ended Thursday noon.

Eight cars remained in the running at the close. The Cutting and McFarlan did not appear at the start, the Staver withdrew at the end of the second day and continued as official car. The pilot, pacemaker and press car stayed through. One of the non-contestant cars, that of President H. J. Clark, was abandoned in the mud at the end of the first half of the third-day run. The other non-contestant, Dr. H. G. Blanchard of Waseca, Minn. ,ran through, although breaking three springs, an axle and having some tire trouble.

Owing to closeness of the record of the Hupmobile and the Studebaker car driven by W. H. Soules, the decision as to the award of the Daily News trophy for the runabout class has been left to the national contest board. The unofficial points are 22 for the Hupmobile and 21 for the Flanders.

The second half of the 7-day run was much easier on cars and drivers than the up trip. A large part of the distance in North Dakota was over the Meridian road which is in fair condition. The route from Winnipeg to the border at Emerson was on the east side of the river and far superior to the north bound road which was one of the worst found in the first 3 days of the endurance run. At Emerson a short trip was made west to Pembina, where the cars were cleared at the United States customs house.

While it was discovered that the north route through the middle part of the state and the White Earth reservation is not yet ready for persons who want easy touring, a perfectly feasible road was discovered returning to Minneapolis. A great part of the road is posted. The whole length of the Meridian road had two signs at each corner and slow signs on bad turns. This made the work easy for the pilot as well as the pacemaker. At intervals a short cut had been made by the pathfinder, usually along the right of way of a railroad, which always resulted in a disagreeable run, owing to the recent rains in the district. Most of the mire holes encountered were on these detour roads, owing to the fact that the railroad being high acts as a dike and causes the water to stand in the gumbo soil.

The first dust encountered was in the sandy soil the last day as the route neared Minneapolis. Some fine roads exist in the vicinity of Fergus Falls and Alexandria, favorite touring spots. Wilkin county, however, between McCauleyville and Breckenridge and between Breckenridge and Foxhome, appears to have the lead for the Automobile Club of Minneapolis good roads bronze statue, hitherto in possession of Renville county, won in 1910. The reason for the award will be that the roads are consistently smooth and with good connections at culverts and bridges. Absence of chuck holes also moved the chairman of the good roads committee, Louis Koch, to decide for Wilkin. Douglas county, in the famous park region of the state, has excellent and well dragged roads, but occasional chuck holes worked in favor of Wilkin, which is newer in road work.

The return route from Winnipeg being the older one, is more traveled than the western road. More motor cars owned locally were met and more international tourists were encountered. The scenery on the return trip is perhaps more beautiful, yet to the tourist who likes wild and untouched nature the eastern route through the Indian reservation will appeal strongly. It transpired on the trip that the offer of the club trophy had resulted in much road work by the traversed counties and in an advance in road making methods due to the publicity of standard road building rules.

Motor car dealers on the tour were encouraged to believe there is to be a good mark in their line for the 1912-1913 season, owing to the tremendous crops already harvested and being threshed; and to the interest taken at all controls in the merits of the various entered cars. The parked machines were the center of inquiry at every control and as a rule every town turned out its large quota of citizens to watch the travelers through their limits.

Two cars went through without mechanical troubles, the Marmon with perfect score, the Cadillac with many penalties, but mainly for broken spring work.

The tire record shows as follows: No. 1, four Goodrich tires, no trouble; No. 2, Goodyear tires, two blowouts, nine punctures, all rear tires; No. 3, Studebaker, two Firestone tires in front, two Morgan & Wright in rear, three inners in front tires; No. 5, two Millers in rear, two blowouts, one Goodyear and one Hartford front, no trouble; No. 7, same Kelly-Racine used on pathfinder trip, all blew out, altogether three blowouts and eight punctures; No. 8, Kelly-Racine, one puncture, one blowout; No. 9, Kelly-Racine, one blowout, two rear punctures; No. 11, Goodyear, six punctures, three blowouts; No. 12, Goodyear, old tires, one puncture and one blowout, came in on Michelins; Brictson press car, Pierce-Arrow, four Goodrich tires covered with Brictson treads, same air as in the 1911 Glidden, no trouble. Paige, pilot, Kelly-Racine tires, no changes; pacemaker Stoddard-Knight, Hartford and one Goodrich, two blowouts and four punctures.

BUFFALO ROUTE BLAZED

Buffalo, N. Y., Aug. 20—The pathfinding crew for the third annual reliability run of the Buffalo Automobile Club, to be made September 11-14, completed its labors Friday night in the Studebaker 30 car which was sent from Detroit for the work of mapping out the course to be taken on the annual run. In the 4 days consumed for the completion of the course

OFFICIAL SCORES OF THE WINNIPEG RUN OF THE AUTOMOBILE CLUB OF MINNEAPOLIS

	1st Day			2nd Day			3rd Day			4th Day			5th Day			6th Day			7th Day			Total Penalties
	Road	Time	Work	Road	Time	Work	Road	Time	Work	Road	Time	Work	Road	Time	Work	Road	Time	Work	Road	Time	Work	
Marmon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
*Hupmobile	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	22
*Studebaker 20	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	21
Cadillac	0	0	0	0	0	0	0	32	1	3	0	320	0	7	280	0	0	0	0	0	0	643
Mitchell	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	130	61	3	0	0	197
Paige-Detroit	8	0	1	20	0	1	3	77	34	6	0	59	12	0	0	0	0	23	3	0	0	247
Warren-Detroit	0	0	0	0	0	0	0	14	1	0	0	273	9	0	18	0	0	2	0	0	0	317
Reo	0	0	0	36	0	1	6	0	0	4	0	3	3	0	0	15	0	0	0	0	0	68

*Referred to A. A. A. contest board

REASONS FOR CAR PENALIZATION

NO. 5—CADILLAC

Third day....	32	Late
	1	Work
Fourth day...	3	Water
	320	Spring and steering arm
Fifth day.....	280	Spring work
	7	Late
	643	

NO. 7—MITCHELL

Third day....	3	Tight drip pan replace cap on radiator
Sixth day....	2	Remove steering arm
	48	Repair steering arm
	1	Adjust magneto
	130	Late
Seventh day..	3	Engine stop 2½ min.
	197	

NO. 9—WARREN

Third day.....	14	Late
	1	Work
Fourth day...	3	Spark plug
	270	Spring work
Fifth day.....	6	Water
	3	Oil
	18	Spring work
Sixth day.....	2	Tight bolt on spring shaft
	317	

NO. 8—PAIGE

First day.....	1	Magneto trouble
	8	Engine stop: overheat
Second day....	20	Water and shift arm stuck
	1	Clean magneto
Third day.....	3	Water
	77	Late
	34	Work on magneto
Fourth day....	6	Water
	44	Work on crank case
	15	Work on spring
Fifth day.....	12	Water
Sixth day.....	23	Broken spring
Seventh day..	3	Water
	247	

NO. 11—REO

Second day...	27	Engine hot, stop and water
	1	Work
	9	Water
Third day.....	6	Water
Fourth day...	3	Water
	4	Spark plug
Fifth day.....	3	Water
Sixth day.....	15	Water
	68	

to be taken, 838 miles were traversed, the pathfinder returning to Buffalo every evening after each day's labor. An average of 210 miles daily was made by the pathfinder.

The route taken by the pathfinder Studebaker was along Lake Shore through Dunkirk and Fredonia to Ripley. Roads along this route were found in excellent shape. At Ripley the crew turned up through Findlay lake territory along Lake Chautauqua to Jamestown. Returning, the pathfinder came through Falconer, Cattaragus, Gowanda, to Hamburg. Buffalo was reached at 10 o'clock Tuesday night, 202 miles having been covered the first day.

Wednesday Buffalo to Warsaw, past the Craig Colony, Mt. Morris, Springwater, to Taber's Corners, through forests to Naples, along the shore of Lake Canandaigua to Canandaigua, N. Y. Returning, West Bloomfield to Noa, Flowerville to Inverness to Buffalo.

The third day was a record-breaker for mileage, 216 miles having been traversed, Buffalo to Olean, through Machias, Ischua, Smithport. Through northern Pennsylvania a combination of roads from rough country roads to modern macadamized roads were encountered on the tour. On this stretch plenty of hill-climbing will be afforded the contestants. The pathfinder returned through Lewis Run, Custer City, Bradford, Salamanca and in this section discovered an old road which is not on the maps. On Friday, the most strenuous run of the week was made, but the pathfinding crew will keep this route secret until Wednesday, September 11, when the reliability run starts.


PIERCE-ARROW PRESS CAR IN WINNIPEG RELIABILITY

PARIS TRIES TRAFFIC REFORM

Paris, Aug. 10—Paris is attempting traffic reform on American lines. A scheme drawn up by William P. Eno, an American citizen, is now being put into force. Its most important feature is the establishment of a one direction flow of traffic in certain cross streets and in avenues having some central dividing line. On the big public squares the gyratory system of traffic has been established, and in the Avenue des Champs-Elysees, the most important of the French arteries, the reserving of the central portion to motor traffic only is continued.

In order that drivers may be thoroughly acquainted with the new traffic conditions, a large number of explanatory booklets have been printed and distributed. Although Paris is not laid out with the same regularity as the leading American cities, its conditions lend themselves to the application of the rules enforced in many parts of the United States. The greatest difficulty is met with in the drivers themselves, who lack the discipline of those of other countries and cannot be induced to obey laws without discussion. The French driver's method is to pass through wherever there is an opening regardless of traffic rules.

Pathfinders Meet With Adventures

GLIDDEN PATHFINDERS AT LINCOLN MEMORIAL NEAR BUFFALO, KY

Scouts Laying Out Trail for National Reliability Find Muddy Roads in Tennessee—General Idea of Route Outlined by Crew of Flanders Electric, Now in South

MEMPHIS, Tenn., Aug. 17—When the pathfinding Flanders electric coupe, which is laying out the route for the national tour of the American Automobile Association from Detroit to the city of New Orleans, reached Memphis it had covered 973.9 miles of the 1,600-mile route and had before it problems that appeared just as insurmountable as did those of the second week of the journey of the Glidden route markers.

From Mammoth Cave to Memphis, a distance of 400 miles, was pronounced an impossible route owing to the heavy rains which have prevailed all through the present year. At Long Muddy creek bottoms, passing along the bank of the creek of that name, the farmers had started to rebuild a levee which had been washed away by the spring freshets, and for a height of 6½ feet had thrown up the water-soaked earth from the side of the road. Along the top of this pile of mud the roadway ran and the pathfinders had to cross to secure the distances for the route maps being prepared by pathfinders. Inch by inch the electric worked its way through, taking 8 hours for the seemingly impossible task. This brought over the pathfinders into pitch darkness, and as the map-maker cannot work at night and indicate cross roads and land marks the party took the tip of some kindly natives and slept in a church on the hard side of hard planks. The inside of the church was in course of construction. In the journey the pathfinders have reached towns regularly with the one exception mentioned.

Part of Route Outlined

From Mammoth Cave to Nashville is 108 miles and the tourist will stop at Bowling Green, 62.5 miles, for dinner. From Nashville to Sheffield, Ala., is 124 miles, and the tourists will stop at Columbia, 43½ miles, for dinner. This will allow a late start from Nashville, as the pike to Columbia is one of the finest roads on the trip to drive over. From Sheffield to Memphis, 1 day's run on the Glidden tour of 2 years ago, will be divided into 2 days' running this year, the night stop out of Sheffield being at Rodgers Spring, with Corinth, 63.4 miles, as the noon stop. Rodgers Spring is a delightfully located health resort with a rustic hotel which is a paradise. This point is 98.8 miles from Sheffield. From Rodgers Springs to Memphis is 70 miles, which will land the tourists in Memphis early on the eighth day of the pathfinding tour.

Delays have been caused in the pathfinding trip by errors in the route as laid down 2 years ago, when the tour went to Dallas, Texas, through much of this route, the necessity of corrections and of arranging for stopping places, noon stops and for gasoline and other supplies for the tourists.

The news that the tour was again coming through this section caused much activity among the farmers in road-building efforts, and the pathfinders struck the country just at the time when miles of roads had been under course of construction for some time, and road building down south means, as a rule, the throwing up of the dirt from the roadside, where it is gradually rolled by traffic

When the tour comes through the roads will have been made, but the pathfinders were forced to work their way through. The people of the country south of Columbia and east of Nashville have caused many a laugh with the pathfinders, as almost without exception they have been frightened more at the sight of the car than were their horse or mule, which they frequently unhitched, while their women folks and children slid from the vehicles as though their very life depended on it. And the horses seldom moved in their steps.

Detours Through Woods

Where hills have been encountered the rains have washed the surface to such an extent that detours have been cut through the woods, the stumps still standing dangerously high for cars that are hung very low.

The liveliest possible interest in road building work was found in county after county during the week of travel, and a number of counties had appropriated sums which in the total amount to hundreds of thousands of dollars for the construction of roads. The country was found aroused to the road question, and good roads all along the route will follow as the result of the present pathfinding trip and of the tour itself.

From Memphis the tourists will travel southward through Jackson, Miss., with a detour from that point to Vicksburg and then from Jackson to Baton-Rouge and New Orleans.

Pathfinders at Cruger

Cruger, Miss., Aug. 20—Out of a total of 125 miles covered by the pathfinder Sunday, 101 miles were added to the official route, the other 25 miles are chargeable to re-routing a 12-mile section of the road. Pathfinder Westgard left Lulu, Miss., Sunday morning and made Glenwood without incident, save a series of ovations received along the way and a number of stops occasioned by parties going to and from church and whose horses, unaccustomed to motor cars, showed a great deal of timidity.

Monday afternoon was consumed by a royal entertainment provided by citizens of Glenwood whose hospitality was so enthusiastic that Pathfinder Westgard had not the heart to disappoint them by making the early start he had intended at the first.

Cruger was reached in the afternoon and here another royal reception and entertainment awaited the party. Owing to a washed-out bridge on the route, just beyond this point, the pathfinding party was forced to spend the night at Cruger. In the meantime a temporary bridge is being built and, barring more rain, the indications are favorable for a good run into Jackson.

Massachusetts Attracts the Tourists

GLIDDEN SCOUTS CROSS TENNESSEE STATE LINE NEAR MITCHELL

Comparisons Made in Registration Bureau Shows How Bay State Attracts Visitors—More Than 700 Outside Cars Reported to Have Checked In—New England Profits

BOSTON, Mass., Aug. 17—That New England in general and Massachusetts in particular is the nation's playground in summer is borne out with greater emphasis again this year when the facts and figures relative to motor touring is considered. The section may well be termed by tradesmen the golden trail. This time last year a compilation was made of the visiting cars that were registered in the Bay State under the 3 months clause of the state law just to note where the greater number came from.

Comparison of Figures

Compared with figures gathered today those of a year ago are very interesting. In 1912 up to the middle of August there were about 400 cars belonging to non-residents registered in this state. Today if a person is at all observant one may see that X700 has been reached, the X denoting that the car belongs to an owner spending the summer in Massachusetts.

Of the 400 machines registered a year ago thirty-one states and the District of Columbia were represented. It must be borne in mind, however, that for every car registered here there are scores of machines which are driven into the state for a few days only, and are driven away again before the 10-day limit expires. So that the total number of visitors runs high up in the thousands.

Of the more than 700 cars registered this year there are but twenty-nine states on the list besides the District of Columbia. Some states represented a year ago are not registered this year, but there are four new ones on the 1912 list. Considering all the cars that pass through Massachusetts in summer it is probable that about every state in the union has been represented at some time or other.

A comparison of the figures shows some interesting facts. First of all the increase has been general all along the line, the east showing to greater advantage. This is not strange. New York, the leader of a year ago, still remains in a class by itself and the figures have increased from 121 to 209 cars.

In 1911 New Jersey and Pennsylvania were close rivals, the former with thirty-five and the latter with thirty-four cars. It is a different story this year. Pennsylvania holds second place by a good margin, its figures more than doubling for there are seventy-eight Quaker cars on the list. New Jersey showed a gain from thirty-five to fifty-six.

Missouri Well Represented

Somewhat surprising are the figures for Connecticut and Rhode Island. Last year there were only fifteen Connecticut cars registered to forty-three now, while Rhode Island's twelve has jumped to forty-two. Another state that shows a big gain for Illinois, from fifteen to thirty-nine cars.

Missouri, too, has joined the procession of good representatives, for her figures nearly double, the twenty-one of a year ago running to forty. Ohio also has forty on the list where last season there were only twenty-eight. New Hampshire with but two last year has jumped to twelve and Michigan has nearly doubled with fifteen instead of eight.

Maryland is worthy of more than passing mention, for that state nearly tripled its figures, going from six to seventeen. District of Columbia, that had nine last year, is now higher up with twelve. Virginia with but one car a year ago has five now; Tennessee has six where it had but three; Maine has three where it had but one.

That distance makes no difference to motorists of the present day is shown by the long distances some of them come. For example, California is on the list this year with seven cars. Last year there were none from that state. Texas had three a year ago and this season has eight. Colorado has two where none were registered last year.

The south is represented by Alabama with two cars, last year three; Florida three, last year two; Georgia one, last year none; Louisiana four, last year two, a very respectable showing. Nebraska four, last season one; Minnesota two, formerly three; Wisconsin one, the same as last year, represent the west beyond the Mississippi very well, not including the Rockies and beyond. Other states include Indiana with a drop from nine to three; Iowa two, the same as 1911; Kentucky four, a gain of two; and Kansas one, last year none. North and South Carolina, Arkansas, Delaware and Washington are off this year's list, the new ones being California, Colorado, Georgia and Kansas.

Cars from Other Countries

For real distance the cars registered from Brazil and Honolulu give evidence that their owners know where to go to enjoy summer life. There was one car registered from each place. Porto Rico had two cars on the list and Cuba had one, while Canada has two. In a number of instances the owners gave their summer residence in the Bay State instead of their permanent residence, otherwise the figures would have been increased for several states, perhaps.

If one were to allow but twenty-five cars here for each one registered, a low figure, it would show at least 17,000 or 18,000 cars were here in summer. However, the figures must be much larger. Allowing an average of three persons to a car it is not too much to say that 50,000 motorists will visit us this year. Going still further into figures and allowing an average expense of but $10 for each one it would mean that Bay State business men would get $500,000, while as a matter of fact the receipts are more likely to be $1,000,000.

Up at Breton Woods, where a compilation of motor touring is kept very accurately, the July figures showed that of 2922 guests at the hotels 1803 reached there by motor cars, 512 machines being garaged there. This is an average of 61.5 per cent.

Routes and Touring Information

THE FLANDERS ELECTRIC, PATHFINDER FOR THE NATIONAL TOUR, ON THE BARDSTOWN PIKE, KY

TOUR THROUGH TO NORTHWEST

NORTHWOOD, Ia.—Editor Motor Age—Kindly advise me of the best route from Albert Lee, Minn., to Sherman, S. D., also from Albert Lee to Madison, S. D.—Reader.

Follow the Blue Book route to Jackson, Minn., through Alden, Blue Earth, Guckeen, Fairmont, Sherburn, and Jackson, a distance of 87 miles. The most direct road to Sherman is through Worthington and Luvern, and on to Madison, passing to the south of Coleman and Wentworth.

COLUMBUS, NEB., TO KANSAS CITY

Columbus, Neb.—Editor Motor Age—I would like the best route from Columbus, Nebr., to Holton, Kans., by way of Parkville and Kansas City, Mo. Also direct route from Holton back to Columbus, Neb.—L. C. V.

The best route to take is to go to Omaha, a distance of 83 miles, passing through Benton, Schuyler, North Bend, Ames, Fremont, Waterloo, Elkhorn, Omaha. Leaving Omaha for Holton, Kan., 161.5 miles, over natural dirt roads, the towns en route are Fort Crook, La Platte, Plattsmouth, Mynard, Wyoming, Nebraska City, Julian, Auburn, Howe, Verdon, Falls City, Hiawatha, Horton, Holton.

From Holton, Motor Age suggests that you go to Topeka, 32 miles, passing through Mayetta and Hoyt. Turning east for Kansas City, 78.6 miles, the towns are: Grantville Station, Perry Station, Midland Station, Lawrence, Endora, DeSota, Bonner Springs Station, Kansas City. Make a side trip to Parkville from Kansas City.

On your return trip from Kansas City you could go to Hiawatha through Piper Station, Wallula, Leavenworth, Lowemont, Atchison, Lancaster, Huron, Everts, Hiawatha, and then return to Columbus, Nebr., over the outgoing trip. However, at Hiawatha, you could vary the return portion by going west to Marysville, thence to Lincoln, Nebr. This route is over rolling country with good roads in dry weather, the towns being Hiawatha, Fairview, Sabetha, Oneida, Seneca, Baileyville, Marysville, Okato Station, Wymore, Blue Springs, Beatrice, Pickerell, Cortland, Princeton, Lincoln. The distance is 149 miles.

From Lincoln go west 58 miles to Fairmont through Emerald, Milford, Friend, Exeter; then north from Fairmont over a portion of the Nebraska division of the Meridian road through York, Stromsberg, Osceola, Shelby to Columbus, Nebr. Volume 5 of the Blue Book gives complete running directions, also other routes in this locality, should you desire to make other detours.

IOWA TO CALIFORNIA

Sioux City, Ia.—Editor Motor Age—Kindly give me the best route from Sioux City, Ia., to Los Angeles, Cal.—E. T. Kearney.

With Omaha, Neb., 109.2 miles, your first stopping point, the towns en route are: Sioux City, Salix, Sloan, Whitney, Onawa, River Sioux, Missouri Valley, Loveland, Reels Store, Crescent, Council Bluffs, Omaha. You will have a good dirt road as far as Sioux River, and the next 6 miles in wet weather is bad. For the balance of the route see communication in August 15 issue, page 24, headed "Long Trip Planned."

SIOUX CITY TO OKLAHOMA CITY

Sioux City, Iowa—Editor Motor Age—Please give me the best route from Sioux City, Iowa, to Oklahoma City, Okla., by way of Dewey, Okla.—E. C. Craig.

This will be a trip almost due south across two states and into a third state, and should be a delightful one, as it follows for some distance along the bluffs and in the valley of the Missouri river. Enroute to Omaha the principal towns passed through will be Salix, Onawa, River Sioux, Missouri Valley, Crescent and Council Bluffs.

Crossing the river at Omaha you will run through Fort Crook, Plattsmouth, Nebraska City, Auburn, Falls City, Hiawatha, Highland, Manning, Troy, Wathena, to St. Joseph; thence through Rushville, Atchison, Lowemont and Leavenworth to Kansas City. There is a shorter road from Hiawatha via Everts, Huron and Lancaster to Atchison, but it is bad in wet weather as far as Huron; and perhaps you would wish to go through St. Joseph anyway. Leaving Kansas City the wayside points will be Olathe, Wellsville, Ottawa, Garnett, Colony, Iola, Humboldt, Chanute, Thayer, Cherryvale, Liberty, and Coffeyville. Shortly beyond

Coffeyville you will digress from the main road to reach Dewey, but, as it is in the adjoining county, local information can be obtained regarding the towns enroute.

Resuming your journey, at Bartelesville you can get running directions to Collinsville; proceeding thence to Owasso, Tulsa, and Muskogee. At this point turning west via Boynton, Morris, Okmulgee, Sharp, Okemah, Bearden, Shawnee, Newalla, and Marion to Oklahoma City. Some rough stretches of road may be looked for in Oklahoma, although the people of the state are keen on the good roads subject and are improving their highways as rapidly as possible.

CHICAGO TO CLEVELAND

Milwaukee, Wis.—Editor Motor Age—Kindly give me the best route from Chicago to Cleveland, O.—T. W. Davis.

From Chicago to Cleveland your best route will be through Whiting, East Chicago, Hessville, Highlands, Schererville, Merrillville, Valparaiso, LaPorte, South Bend, Goshen, Ligonier, Kendallville, Bryan, Archbold, Ridgeville, Napoleon, Liberty Center, Bowling Green, Woodville, Fremont, Clyde, Sandusky, Huron, Lorain, entering Cleveland via the boulevard and Edgewater Park.

WILL VISIT THE HOOSIERS

LaFayette, Ill.—Editor Motor Age—Please give me a route from Toulon, Ill., to Jeffersonville, Ind.—Ross Shockley.

Reaching the main traveled road at Galva, turn southwest toward Galesburg, then angling to the southeast, running through Maquon, Farmington, Peoria, Tremont, Bloomington, passing just north of Gibson City, and on through Hoopeston, Oxford, LaFayette; then bearing more to the south via Frankfort, Indianapolis, Franklin, Columbus, Seymour, Crothersville, Henryville to New Albany; thence running east along the Ohio river to Jeffersonville.

ROUGH ROAD TO MAMMOTH CAVE

La Salle, Ill.—Editor Motor Age—In reference to routing from Decatur, Ill., to Bowling Green, Ky., in Motor Age, issue of August 8, would say no motor car should go beyond New Haven, Ky., on to Mammoth Cave, as the pike, as they call it down there, is nothing more than about 50 miles of jagged rock and would destroy the best set of tires that could be put on a car. Motor Age would do tourists in that section a great favor by halting them at New Haven, and advising taking the railroad in making a trip to Mammoth Cave, Ky. The writer made this trip about July 20 this year and was tempted to write Motor Age of road conditions at that time. —A Subscriber.

WANTS A WISCONSIN ROUTE

Chicago—Editor Motor Age—Starting at Lake Geneva, what would be a good week's tour in Wisconsin, taking in, say, a half a dozen to a dozen resorts, as Madison, Waukesha, Oconomowoc, etc.? I would not wish to go over 100 miles a day, or stop at night at poor hotels.—Hollis E. Potter.

For a leisurely trip, such as suggested, Wisconsin is well chosen, and even less than 100 miles will sometimes be the portion for a day in order to not exceed 100 miles per day yet have at night the most advantageous stopping place.

Starting toward the west in the morning of the first day, having thereby the sun at your back, let your journey be through Delavan and Emerald Grove to Janesville for the noon stop. Angling to the northwest from this point pass through Edgerton, Staunton and Lake Waubesa Station to Madison, a distance in all of about 78 miles. This is a short day's run, but it gives opportunity for enjoying some of the many delightful drives in and about Madison.

With the intent of reaching the west shore of Lake Winnebago, the second day's journey might be through Sun Prairie, Columbus, Beaver Dam, Waupun, Brandon, Ripon, Green Lake and Berlin to Oshkosh, the mileage in this instance reaching 112 miles. But if this is greater than desired, it is not necessary to run into Green Lake, but, turning northeast at Ripon, pass through Picketts to Oshkosh, reducing the distance to 95 miles.

Along the western side of Lake Winnebago run north from Oshkosh via Neenah, Appleton, Kaukauna, Wrightstown and De

Late Road Reports for the Mototists

The Blue Book car reports the following conditions on new and old routes:

Chicago to Joliet. The car went down Halsted street and Vincennes road to One Hundred and Eleventh street, Morgan Park, where it turned west, following the direct road to Sag Bridge in Lemont. The road is pretty good to Lemont, being only fair the rest of the way to Joliet.

Joliet to Kankakee via Manhattan, Wallingford and Manito is a new route. It is practically all dirt road. Although fairly good in dry weather it would be poor after rains.

Another new route, Momence to Morocco, makes a connection between the Chicago-Momence route into eastern Indiana. The road is not very good, with quite a bit of sand to Lake Village; from there on it is good.

Chicago to Danville is a new route. As far as Morocco this coincides with present routes 11 and 16. Leaving Morocco the new route is straight south through Kentland and then to Danville via Raub, Freeland, Ambia and Hoopeston. The crew reports excellent road conditions all the way.

Attica to Terre Haute. This in connection with route 16 will make almost a straight line from Chicago to Terre Haute as it is almost directly south from Attica through Rob Roy, Veedersburg, Yeddo, West Union and Armiesburg. On fine gravel all the way with some very attractive scenery.

Terre Haute to Vincennes. The crew found the regular Blue Book route to be not only the best, but in excellent shape.

Terre Haute to Bloomington via Bowling Green, Vandalia and Ellettsville is a new route. This is a pike road most of the way and although hilly, in some few spots a little rough. The scenery is very attractive.

Bloomington to Columbus is a new route. It is pike practically all the way; easy to follow but it is quite hilly and very winding. Some of the hills are quite rough with several small fords. The scenery is well worth the trip for those who are not afraid of a little rough road.

Columbus to Greensburg via Hope and Burney is a new route. This is fine gravel all the way.

Indianapolis to Madison via Shelbyville and Greensburg is a new route, most of the way on what is still known as the old Michigan road. Good gravel and stone practically all the way.

Madison to Cincinnati via Rising Sun and Lawrenceburg is a new route. There are surprisingly good road conditions for this section with some beautiful scenery, especially near Rising Sun. In making this connection to Lawrenceburg the Blue Book car tried to go part of the way on the Kentucky side but was warned not to by several people on account of the hostile attitude of the people in that section, which is especially true with regard to strange cars.

Cincinnati to Indianapolis via Lawrenceburg, Greensburg and Shelbyville is a new route. This is an entirely new connection between these important points and road conditions are good all the way.

Indianapolis to Lafayette via Lebanon and Frankfort is a new route. This seems to be much better than the regular route 421 via Kirkland and also a little shorter.

Lafayette to Ft. Wayne is a new route, although going via Delphi, Logansport and Peru. Changes were made between almost all these points as the old routes have been pretty well worn out. The regular route as far as Deer Creek is good. At this point instead of following the Michigan road into Logansport turn east 1 mile and then follow what is known as the Kokomo road. Logansport to Peru, a new route, was covered on the north side of the river. From Peru to Huntington and Ft. Wayne road conditions were reported on previous bulletin.

Logansport to Kokomo is a new route. The car covered two routes but recommended the one via Walton and Galveston to be a little better due to fewer turns. All fine gravel.

Wabash to Marion. New route very good gravel all the way; almost straight south through Mt. Vernon to Mier, then east into Marion.

Huntington to Fort Wayne. New route. This is what might be called a river route on a direct line between these two cities and is good gravel, but is not very much traveled. Although not quite as fine gravel as regular Blue Book route it will make an excellent option and is quite a bit shorter, following the river practically all the way through Mardines and Roanoke.

Fort Wayne to Toledo. The first part to Defiance, over regular Blue Book route is the best, with two long straight stretches, making good time possible. From Defiance to Napoleon the Blue Book car reports the canal road via Florida to be exceptionally fine. Between Napoleon and Toledo the car went over three different routes and finally decided that although the present route is all right for this year, next year a new connection from Liberty Center to White House and then direct on the north side of the river into Toledo will not only be much shorter, but in excellent condition when a 4-mile stretch of sand is gravelled, this being promised before spring.

Fort Wayne to Detroit via Napoleon, Wauseon and Ypsilanti. The first part of this route to Napoleon is reported above. From there to Wauseon and Adrian the present route is the best, although there are slight changes between Ottokee and Lyons. In wet weather there is a 14-mile straight stretch of clay into Adrian that is liable to be pretty bad, although usually good in dry weather. From Adrian to Ypsilanti is fairly good over the present Blue Book route. The rest of the way into Detroit will be practically all concrete when the new work under way is completed.

Ann Arbor to Toledo via Saline and Milan. New route. It is fairly good to Dundee. The scouts found that present Blue Book route to Ida was very bad in wet weather and the car covered a new route which is considerably improved, although there is very little gravel. The rest of the way into Toledo coincides with route 707.

Toledo to Lima and all points south of Findlay. Due to the completion of a new road the route is changed materially to Bowling Green, where instead of following the old route from here south you can keep straight south through Findlay, clear to Kenton, although for Lima you follow the regular Blue Book route from Findlay.

Napoleon and Defiance to Lima via Ottawa. New route. These two routes coming from the north join at Ottawa. Roads all the way are good macadam or gravel.

Lima to Richmond. New route. The first part coincides with present route 610 as far as Piqua, thence southwest through Greenville and New Madison to Richmond. Good gravel with some macadam all the way.

ROAD THROUGH WOODS AT GEARHART, ORE.

Pere to Green Bay, 54.8 miles. Continuing to Sturgeon Bay in the afternoon, a distance of 48.8 miles, through New Franken, Casco, Rio Creek, Forestville and Maplewood.

Running to Ephriam the fourth morning, a distance of 27.3 and back to Sturgeon Bay by lunchtime, the afternoon's drive will be to Manitowoc via Maplewood, Forestville, Algoma, Kewaunee and Two Rivers.

The next day's drive will cover a distance of 97 miles, being through Valders, Chilton, Brothertown, Peebles Station to Fond du Lac by noon, with Oconomowoc the objective point for the night, while the wayside points will be Byron, Lomira, Theresa, Mayville, Iron Mountain and Ashippun.

Leaving Oconomowoc the next morning for a run of 32.5 miles to Milwaukee via Pewaukee, Hartland and Brookfield; in the afternoon returning to Brookfield, thence to Waukesha, Mukwanago, East Troy and Elkhorn to Lake Geneva.

If it is desired to add another day or so to the tour, this may very happily be done by remaining a day at Ephriam, also making Fond du Lac the base for a run to Sheboygan. The Blue Book, volume 4, gives complete running directions for this tour.

SHORT ROUTE IN INDIANA

Fithian, Ill.—Editor Motor Age—Please advise me the best touring route from Fithian, Ill., to Rochester, Ind.—C. H. DeLong.

First running to Danville, the following will be your itinerary: Covington, Attica, Lafayette, Delphi, Logansport, Rochester, and you should have very good roads all the way.

GOOD ROUTE TO FORT DODGE

Covington, O.—Editor Motor Age—Please give me a good route from Covington, O., to Fort Dodge, Ia., as I want to make this trip very soon.—S. B. Bashor.

Motoring to Piqua, where you will strike the main thoroughfare to Lima, proceed via Sidney, Wapakoneta to that city. Your way then will lie to the northwest, touching Delphos, VanWert and Fort Wayne. Heading next for South Bend, as by taking this route in preference to the more direct one to Chicago, you will avoid about a 20-mile stretch of poor road in the river bottoms of the Kankakee, pass through Churubusco, Ligonier, Goshen, and Mishawaka. Of the towns between South Bend and Chicago are mentioned LaPorte, Ainsworth, Merrillville, Schererville, Highlands, Hessville, East Chicago, Chicago.

Leaving Chicago for Dubuque you should pass through Oak Park, Addison, Elgin, Marengo, Garden Prairie, Belvidere, Cherry Valley, Rockford, Freeport, Warren, Shullsburg, Hazel Green, East Dubuque, crossing the river into Dubuque. Then traversing what is known as the Hawkeye highway, the remainder of your journey will be via Dyersville, Manchester, Independence, Waterloo, Cedar Falls, Austinville, Ackley, Iowa Falls, Webster City to Fort Dodge.

ILLINOIS TO KANSAS

Griggsville, Ill.—Editor Motor Age—I would like a good motor route from Griggsville, Ill., to Moundville, Kas., via Kansas City.—John A. Read, Jr.

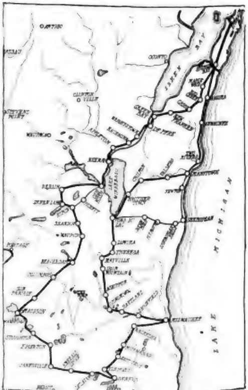
From Griggsville go to Louisiana, thence to Mexico, Mo., through Vera, Bowling Green Curfyville, Vandalia, Laddonia, Mexico, a distance of 60 miles. With Kansas City your objective point, 188 miles, continue west through Thompson Station, Clark, Moberly, Huntsville, Mt. Airy, Roanoke, Armstrong, Glasgow, Gillian, Slater, Marshall, Mt. Leonard, Blackburn, Corder, Higginsville, Mayview, Odessa, Oak Grove, Grain Valley, Blue Springs, Independence, Centropolis, Kansas City. If you do not wish to make this entire distance in one day, you might make Marshall your night stop.

Kansas City to Moundville takes you through Grand View, Belton, Peculiar, Harrisonville, Lone Tree, Archie, Adrian, Butler, Athol, Rich Hill, Arthur, Horton, Wales, Nevada, Nassau, Moundville.

MISSOURI AND ARKANSAS ROUTES

McFall, Mo.—Editor Motor Age—I would appreciate route information from St. Joseph, Mo., to Arkadelphia, Ark.—F S. Jolly.

The route herewith outlined may seem somewhat roundabout to you, but road conditions are a paramount factor and this has been considered in outlining the route. St. Joseph to Kansas City, 83.4 miles, is through Lake Station, Hall Station, Russville, Mo., Atchison, Lowemont, Leavenworth, Kansas City. Leaving Kansas City with Neosho, Mo. on your first night stop, 185 miles, the intermediate points are: Belton, Harrisonville, Archie, Adrian, Butler, Rich Hill, Horton, Nevada, Sheldon, Lamar, Jasper, Carthage, Fidelity, Neosho. Nevada would make a good noon



TOURING THROUGH WISCONSIN TAKING IN THE SUMMER RESORTS

stop, and good garages will be found on this stretch.

Neosho to Fayetteville, 84 miles, passes through Pineville, Gravette, Bentonville, Rogers. Over this portion a variety of roads will be encountered, but there are no bad grades or streams to cross.

From Fayetteville to Winslow, through West Fork, and Brentwood, you pass over the Boston mountains, then continue through Chester, Lancaster to Van Buren where you cross the Arkansas river to Fort Smith. From Fort Smith to Little Rock is through Charleston, Paris, Dardanelle, cross the Arkansas river to Russelville, thence through Pottsville, Atkins, Morrelton, Plumerville, Wooster, Conway, Palarm, to Little Rock.

Arkadelphia, Ark. is about 97 miles from Little Rock, going by the way of Hot Springs. Through Collegeville, Benton, Londsdale, to Hot Springs you will have considerable mountain work for about 30 miles, but it should not give you trouble. Leaving Hot Springs the balance of the route is through Lawrence, Social Hill, Friendship, to Arkadelphia.

OKLAHOMA TO MISSOURI

McAlester, Okla.—Editor Motor Age—I am figuring on driving from here to Sedalia, Mo., in the near future and would like very much if Motor Age could inform me of a good route to follow. On account of the poor road conditions directly north of here I will ship my car to Muskogee, Okla., and drive north from there.

So far I have been unable to find out anything regarding the proper way to go through Kansas and Missouri. I have considered driving north from Parsons, Kas., following the M. K. and T. Railroad to Kansas City, and then east to Sedalia, but this makes such a roundabout way that I would rather follow the main line of the M. K. and T. from Parsons, through Ft. Scott, Nevada, and Clinton to Sedalia, providing the roads are in such condition as will permit.—O. C. Jacobs.

Leaving Muskogee the towns en route to Joplin, Mo., will be Wagoner, Mazie, Choteau, Pryor, Ada Adair, Big Cabin, Vinta, Afton, Narcissa, Miami, Baxter Springs and Galena. From Joplin your best route will be north to Kansas City, via Carthage, Jasper, Lama, Sheldon, Nevada, Rich Hill, Adrian, Archie, Lonetree, Harrisonville, Belton and Grandview; thence east via Independence, Blue Springs, Oak Grove, Odessa, Higginsville, Blackburn, Mt. Leonard, Marshall, Arrow Rock, Lamine to Boonville, following from this point the M. K. and T. railroad to Sedalia.

Another way from Joplin would be to go east to Springfield passing through Diamondville, Pierce City, Monette, Aurora, Marionville and Republic. We understand it is possible to get through to Sedalia by going north from Springfield, but that it is very rough traveling, and we are unable to give any of the wayside points. There is also a chance of your going as you suggest from Nevada to Rockville, Clinton and Windsor, following the line of the M. K. and T. railroad; or, by continuing north to Harrisonville, you would be sure of a good road that far and from there might follow the railroad through Holden, Warrensburg and Lamonte to Sedalia, but the only route Motor Age can recommend is that by way of Kansas City.

INDIANAPOLIS TO NIAGARA

Concord, Ill.—Editor Motor Age—I would like to drive my car through to Niagara Falls by the way of Indianapolis, Dayton and Detroit. Will Motor Age please give the best route, and state where would be the most attractions and the best roads? What would be the distance, and how much of the trip would be over hard roads? Also what map or book I could get for this route.—Howard Zahn.

Either run to Prairie or down to Jacksonville, where you will strike a main traveled route leading to Springfield. With Terre Haute the next objective point, 149.5 miles, you will have good natural dirt road with some gravel going via Decatur, Lovington, Oakland, and Paris. From here to Columbus, O., you will travel on the National road. Indianapolis, 70.4 miles, is reached by way of Plainfield. After leaving the Hoosier capital you will pass through Knightstown and Richmond to Dayton, a distance of 108.6 miles; thence via Springfield to Columbus, 67.8 miles, on good pike over level country. Leaving now the National road and branching north toward Toledo, 132.7 miles, the road is good gravel or stone all the way; among the wayside points will be Little Sandusky, Carey, Fostoria, Pemberville. Your best route to Detroit from Toledo will be via Riga, Tecumseh, Saline, Ypsilanti and Wayne, the distance being 92.9, with fair dirt and macadam roads. The run north to Port Huron will be found a delightful one over good gravel practically all the way, a distance of 60.6 miles, via Mount Clemens and Muttonville.

A 7-day permit is allowed in Canada where the party is well-known to the collector of customs; otherwise, an Ontario license must be secured which costs $4, and a bond good for 6 months, costing $5, must be obtained from a customhouse broker; in addition a deposit of $10 is demanded by the broker, but it is returned when the bond is cancelled.

Ferrying from Port Huron to Sarnia, continue through Kertch, Warwick, Adelaide, Lobo, Hyde Park, London, Thamesford, Ingersoll, Woodstock, Oxford, Brantford, Hamilton, Grimsby, Jordan, St. Catherines, St. David to Niagara Falls, Ont., and turning with trolley line across the International toll bridge to Niagara Falls, N. Y.

A Blue Book, volume 4, is recommended.

LAKE GEORGE, CAL., IN THE SIERRAS ON THE PASEAR ROUTE

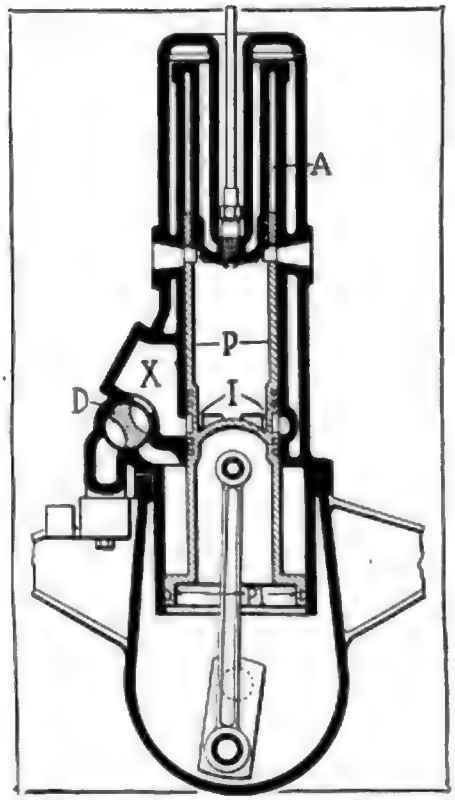


FIG. 1—FEATURES OF KOECKLIN MOTOR

The Readers

High-Efficiency French Motor is Two-Cycle and Uses New Sleeve Valve—Stearns-Knight Measurements—Supplementary Discussion of Power Comparisons

CLEVELAND, O.—Editor Motor Age—Please tell me about a two-cycle sleeve-valve motor built in France, and known as the Koecklin motor, invented and built by G. H. Koecklin. I have designed a two-cycle sleeve-valve motor which does not use a carbureter, absolutely scavenges the cylinder every revolution, fuel is not admitted until cylinder is scavenged, and uses only about two-fifths cylinder full of charge. It is high compression and constant for all speeds and loads. Fuel is fed into cylinder by air from the crankcase. The sleeve performs all the functions of admitting air from the crankcase to the fuel tank, crankcase to cylinder, fuel from tank to cylinder, and release of burned gases. I have been told that the French motor does all that I do with mine.—Robert T. Abell.

The Koecklin motor is the invention of Alfred G. Koecklin, and is of the two-cycle type. It is generally referred to as of the sleeve-valve type, but strictly speaking, the valve is not of the sleeve type, but is merely a tubular extension of the piston. This motor is identified with the high-efficiency group that is being developed in France, one having been built for the grand prix. Fig. 1 shows a cross section of this motor in which P is the piston, which is of the double superimposed type, the lower portion P1 being of a larger bore, and running in the bored-out portion of the cylinder which forms the gas pump chamber.

Above the cylinder head the piston extends upward, forming the valve. This valve is similar to the sleeve type, and is cut with exhaust ports at the cylinder head, and inlet ports at I, and reciprocates in the annular chamber, A. The spark plug is set deep into the hollow cylinder head, as in Knight practice, except that the seat is greatly deeper. At D is a rotary distributor which conducts the gas from the carbureter to the compression pump before compression, and from thence to the adjacent cylinder after compression through the passage X.

As will be seen by a study of the drawing, this motor reverses the usual order, in that the combustion chamber is inclosed by the piston itself, the cylinder head being disposed within the reciprocating combustion chamber. In operation, the valves are opened at the end of the down stroke, the piston extension ports registering with the exhaust valves and the inlet valves, the compressed gas from the chamber X, being admitted to the cylinder, driving out the burned gases.

DIMENSIONS OF STEARNS-KNIGHT

Corpus Christi, Tex.—Editor Motor Age—Please let me know the dimensions of parts of the Stearns-Knight motors:

1—Width of intake and exhaust ports in outer and inner sleeves.

2—Height of center of intake and exhaust ports, respectively, above center of wrist pin on each sleeve.

3—Length of valve operating connecting rods, between centers.

4—Angle between eccentric cranks.

5—Thickness of sleeves.

6—Width of junk ring.—W. E. C.

1—Ports in sleeves are in the form of two slots, placed in the same plane. They are of the same size in both sleeves. The inlet slots measure .5-inch by 2.75 inches, the exhaust ports, .625-inch by 2.75 inches, each. The total port width of each valve therefore, is 5.50 inches.

2—On the outer sleeve, the center of the exhaust port is 7.75 inches from the center of the wrist pin, the intake, 8.25. On the inner sleeve, these dimensions are, for the exhaust, 9.375 inches, and for the intake, 10 inches.

3—The valve-operating connecting rods are respectively, between centers, 2.50 inches, inner, and 4.25 inches, outer.

4—The half-time cranks are set at an angle of 75 degrees to each other.

5—The sleeves are each .1562-inch thick.

6—The junk ring is 1.25 inches wide.

Criticisms By Readers

New York Man Gives Additional Reasons for Car's Power Limitations When in Mud-Hole

NEW YORK—Editor Motor Age—May I take the liberty of supplementing the answers to two correspondents in issue of August 1? One of them asks why four horses can pull a motor-car out of the mud better than its own 30-horsepower motor. The explanation of Motor Age that this is because the horse applies his force more effectively is correct, but it is not clearly stated why the motor fails to apply its force effectively. The real reason in brief is that until the car actually begins to move, the motor cannot exert any effective pull at the rear wheels, except through the friction of the slipping clutch or the slipping wheel, which dissipates most of the energy in heat until the clutch or wheel takes hold; or through the distortion of the shafting.

Power is energy in the act of overcoming resistance. Until the object acted on begins to move, the energy is simply a potential force, like gravity, water head, gaseous pressure, etc. The contraction of the horse's muscles is analogous to an elastic but frictionless transmission, and the forward throwing of his weight on the traces is like the steady pressure of a boiler, which is absent in an explosion motor. The latter's best asset in a mud-hole is the inertia of its rotating parts.

A second correspondent asks why the small-bore French motors develop high power, and the answer is "increased stroke, high compression, and excessive speed." These factors should be separately considered. It is not true that long stroke per se gives increased expansion in a gas motor, for if the compression remains the same, obviously the ratio of compression space to piston displacement, which determines the degree of expansion, remains the same regardless of the relation of bore to stroke. It is true that for equal compression, equal bore and equal speed of rotation, the long-stroke motor gives more power than the short-stroke, but that is simply because we then have the same explosion force acting on a longer lever or crank-arm through a longer distance, in the same time.—Robert M. Pierson.

Clearing House

Modified S. A. E. Formula Compared with Actual Brake Test of Oldsmobile Motor—Correspondent Confuses Piston Speed and Crankshaft Speed

New Horsepower Rating

Reader Believes Constant in Modified S. A. E. Formula Too Great for the Average Motor

KEMPTON, Ill.—Editor Motor Age—I read the columns of Motor Age pretty closely, and was considerably interested in the new horsepower rating contained in the new horsepower rating contained in the July 25 issue under Mathematics of Motoring. Although I lay no claim to being a mechanical engineer, it seems to me that the constant 15,000 in the formula

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is too high. The constant 12,000 in place of the 15,000, according to a formula I saw in Motor Age quite awhile ago, seems to me to be more nearly correct. This new rating does not rate a long-stroke motor any higher than the old standard S. A. E. rating at 1,000 revolutions. Take for example the 4 by 6 Moline motors. The S. A. E. rating is 25.6; new rating is almost identical at 1,000 revolutions per minute. The 5 by 6 Olds motor figures at 40 horsepower by both ratings always assuming 1,000 revolutions per minute. The 4¼ by 5 motor of the car which I drive figures at the new rating at 24 horsepower. The same motor figures at 28.9 S. A. E., thus showing an actual loss over the S. A. E. of over 4 horsepower and this too in a motor in which the stroke moderately exceeds the bore. The claim is made that the standard S. A. E. rating is approximately correct at 1,000 revolutions; then, the new rating cannot be right, as at 1,000 revolutions in the example in August 1 issue it shows the 4½ by 5 motors to have 27 horsepower. The S. A. E. shows 32.4. Now, to take the constant 12,000, take a 5 by 5 as the Speedwell motor, using 12,000 in this formula, shows 41⅔ horsepower, practically agreeing with the S. A. E. on a square motor. Now, again take the 4 by 6 Moline, S. A. E. rating 25.6 with the 12,000 constant, 32 showing an increase of power for the increased stroke. Taking everything into consideration, I fail to see where the new rating is of any use.—Clarence B. Keighin.

Undoubtedly, some motors will develop in actual brake tests greater power at their maximum speeds than shown by the 6-in stroke will figure at 1,000 revolutions per minute, the horsepower as shown new formula, but there are as many others that will develop less. The difference in results obtained by using the two constants, 12,000 and 15,000, is 20 per cent, and differences in design of individual motors of the same dimensions and at the same speed will cause almost this much variation in brake horsepower. The endeavor in developing the new formula was to simply rearrange the standard S. A. E. rating formula so that it would take cognizance of variations in stroke and crankshaft speed.

Your assumption of 1,000 revolutions per minute for motor car engines is unwarranted as nearly all of them run at a normal speed of at least one-third more. A fairer figure, if you must assume a standard speed for all motors would be 1,400 revolutions per minute. The idea of the new formula, however, is to take differences of crankshaft speed into consideration as well as stroke.

You are correct in your figures for the Moline and Olds motors, assuming they develop their maximum power at 1,000 revolutions per minute, for any motor with by the standard S. A. E. rating, as explained in the Mathematics of Motoring department of Motor Age for August 1. But the Moline motor develops its greatest power at 1,400 revolutions per minute. At this speed, the motor is rated by the new formula at 36 horsepower, which is very close to the actual power shown on brake test at this speed.

The normal speed of the Oldsmobile four-cylinder 5 by 6-inch motor is 1,550 revolutions per minute, not 1,000 revolutions per minute as you have figured it and at its normal speed develops on the brake 58 horsepower approximately. If you figure it according to the new formula, you will find that it is rated at a little over 61 horsepower at 1,550 revolutions per minute. In Fig. 2 is shown a chart illustrating a brake test of the Oldsmobile 4 by 6-inch motor on which is plotted the power calculated at the corresponding speeds by the new formula. The formula, using the constant 12,000 instead of 15,000, would rate these motors much too high. In the case of the 5 by 6-inch motor at 1,550, the figure would be about 73 horsepower.

Brake horsepower of different makes of engines of the same size and running at the same speed vary greatly. Some engines, on account of finer design and workmanship, will show considerably greater power at a given speed than will others of the same bore and stroke even when designed to give their maximum power at the same speed. And very few will be found to give the maximum power at the same crankshaft speed.

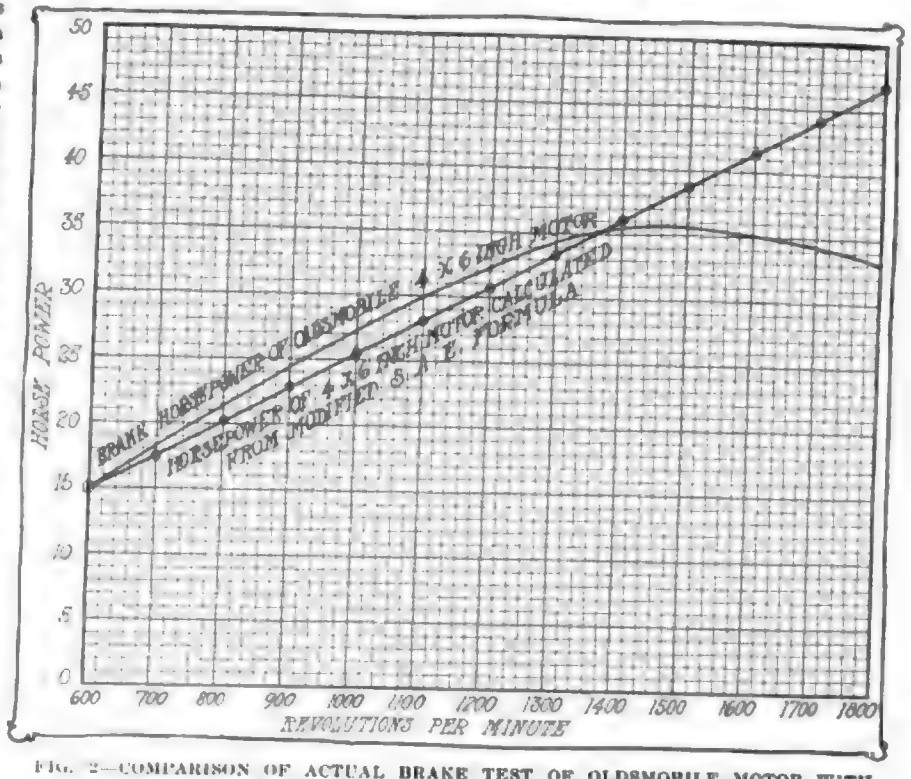


FIG. 2—COMPARISON OF ACTUAL BRAKE TEST OF OLDSMOBILE MOTOR WITH RESULTS CALCULATED FROM MODIFIED S. A. E. FORMULA

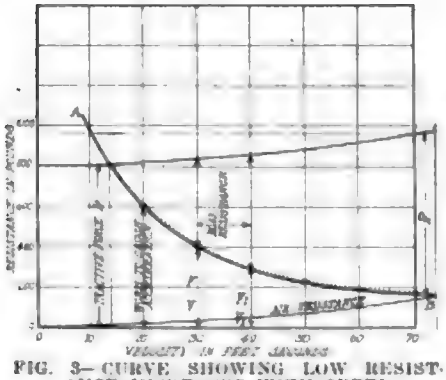


FIG. 3—CURVE SHOWING LOW RESISTANCE INCREASES WITH SPEED

Below are given the horsepowers for a few representative motors as calculated by the new formula at speeds given by the makers as those of maximum power:

Car	No. Cyl.	Bore	Stroke	Max. R.P.M.	S.A.E. H.P.	Modified S.A.E. H.P.
Abbott 20.....	4	4⅛	4½	1,800	27.3	35
Abbott 44.....	4	4½	5½	1,650	32.4	49
Alco 40.....	4	5⅛	5½	1,500	44.1	60
Alco 60.....	6	4¾	5½	1,500	54.1	72
Cole 30.....	4	4½	5¼	1,600	32.4	45.5
Ford T.....	4	3¾	4	1,400	22.5	21
Hupmobile 20...	4	3¼	3⅝	1,800	16.9	17

PICRIC ACID FOR POWER

Minneapolis, Minn.—Editor Motor Age—I would like information regarding the use of picric acid in motors to increase the power, and would like to know the quantity to use with safety.—J. C. Burns.

1—Picric acid, or ammonia nitrate, is an explosive compound which, when used in connection with gasoline as a fuel for motor cars will increase the power of the combustion within the cylinder. To understand this, it is first necessary to consider the requisites for the combustion of a fuel in an internal combustion engine. The gas used to produce this combustion is composed of the fuel contained in the gasoline vapor, which is rendered combustible by its admixture with the oxygen in the air, which composes the body of the gas. Picric acid possesses in its composition a considerable proportion of this element in addition to highly explosive fuel units, and when introduced into the charge of a gas engine, causes the power of the explosion to be augmented by the increase of the amount of oxygen. It furthermore possesses the peculiarity of being soluble in gasoline to only a limited degree, and for this reason is usually diluted with alcohol or ether before mixing with the gasoline.

Best results are obtained by the use of 1 ounce of picric acid and 2 ounces of sal ammoniac to 5 ounces of gasoline. It is well to observe extreme caution in using anything of its kind, for gasoline motors are designed within comparatively narrow limits of strength, and can be expected to resist very little more than the pressure normally exerted by the combustion of pure gasoline gas.

There is danger in handling this substance, and it is not recommended for use in motors.

Another Reader on Gear Changes

York State Motorist Urges High Top Speeds—Says Manufacturers Should Consult Owners in Fixing Ratios

PAUL SMITHS, N. Y.—Editor Motor Age—Designers are at a disadvantage in discussing motor cars on the road. This is a broad statement to make, but how many of them ever drive any but their own make of cars? My recreation is owning cars, knowing cars, and driving other people's cars when they will let met. I am not a chauffeur and am as strong an adherent of four speeds as can be found, but I contend that nine out of ten American four-speed cars have the wrong ratio and, undoubtedly, many foreign cars also.

I always was surprised that the National engineers did not put four speeds in its cars. Admittedly, they like the same effect in their stock racing cars, for their advertisements usually say—stock model except for the use of a higher second-speed gear; translated, that comes pretty close to meaning a high third, as should be in a properly proportioned four-speed box. Having driven in one of the stock racers at 65 miles an hour on second, I can appreciate that it is a good deal higher than in the touring models. In its case the car is comparatively light and has a most powerful and flexible motor, which makes up, to a certain extent, for the lack of four speeds; especially so, since the touring models are quite high geared on second, but this same high second sometimes requires you to go up a hill rather faster than comfort dictates. I should prefer a National with four speeds—high about where it is, third a bit higher than the touring second, and second quite a bit lower than it is at present. I am not trying to give exact ratios because I neither have the ratios at hand nor do I discuss from the theoretical standpoint. I am the user, not the manufacturer. I would infinitely rather have a National with its correctly proportioned three-speed gear box than many four-speed cars with incorrectly proportioned thirds.

Compare the National and Pierce transmission ratio in Motor Age July 25. The National second and Pierce third are almost the same. The Pierce third will climb almost any hill that second will and I contend that when driving a Pierce a man would not keep on direct fourth when climbing a hill as long as possible—see Ferguson's article—if he had a high enough third so that his engine would not race when he dropped back.

I think, from road experience mostly, that the American designer usually makes his third too slow in a four-speed gear-set; when third will give you within 10 to 15 miles the speed of high, you have an ideal combination because you can boost your high up a little and save the motion and yet have a nice cruising speed on third. For American conditions, I do not like an excessively high gear, for as Mr. Wall states, your chauffeur must earn every penny, shifting gears. Theoretically, for average conditions, I used to favor four speeds direct on third and even built a car that way, but, unless the car is to see very sandy and hilly conditions, I do not like it because with our constantly improving roads, one is necessarily in indirect altogether too much.

Because I have referred to one car as about right on high, I do not want it inferred that I consider most American cars are right on high; I think most of them are much too low; even, at 30 miles an hour, many of them create a most unpleasant vibration and show plainly that the motor is developing more power than is necessary for level roads. I repeat that I prefer three speeds in proper ratios to four that are not, but four speeds in propor ratio is the most nearly ideal that I have ever used.—Subscriber.

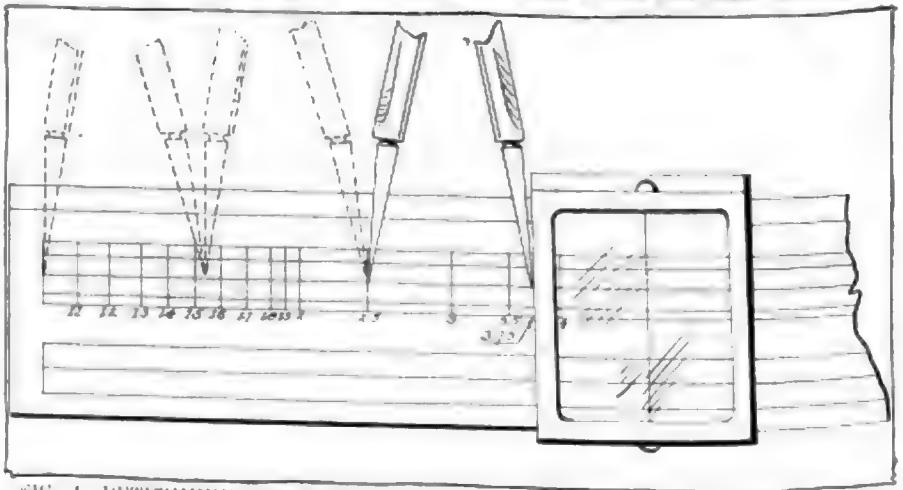


FIG. 4 DETERMINING PROPER GEAR RATIO WITH SLIDE RULE AS OUTLINED BY S. I. FEKETE

Four-Speed Fan Criticizes Cameron

Detroit Engineer Explains Method of Determining Steps of Progression—Advocates Geometrical Method

DETROIT, Mich.—Editor Motor Age—Very recently several of our leading trade papers published a very remarkable article, by W. H. Cameron, on the subject of four-speed transmissions. In this he predicts its general adoption and its necessity. This article certainly came at the right time and on the right subject. I believe that at the present time the minds of several engineers are occupied with the problem of four-speed transmissions.

I wish to introduce a very simple mechanical way of locating correct gear ratios for any number of speeds. At the same time I wish to call attention to Mr. Cameron's paper, to his reasoning and explanations, but would not advise following his diagrams illustrating the steps between the gears, for the reason below stated. In the diagram where ordinate O. X. is apparently the time, while the gears are engaged and ordinate O. Y. stands for the velocity in miles per hour, if we were to make a diagram like that which he illustrates before laying out a set of gears, and in this diagram the steps between velocities were to be equal, then the result would be in some cases an error, because such a diagram gives us the arithmetical progress instead of that which we need, the geometrical progression.

In my opinion, the gears in a transmission should progress in a geometrical progression because the resistance increases in the velocity interval in a hyperbolic curve. During acceleration—getting away—the road resistance increases and is a function of the velocity. If we suppose there is one even condition of the road bed, going at top speed, the road resistance consumes the power output of the motor. If we analyze the increase of the resistance, we find that it is in geometrical progression.

When a car starts, a certain amount of work is required to cause acceleration, and the other part of this work is required to overcome the resistance of the car. The total tractive effort given by the motor is consumed by these two factors. When the resistance is so high as to consume all the tractive effort, then there is no more work left to cause acceleration, and so the car begins to travel with a constant velocity, or in the equation,

Resistance=tractive force.

During acceleration the work is consumed by two factors, one which causes acceleration and the other is the resistance. That is

Force to cause acceleration+resistance=tractive effort.

If we imagine a constant horsepower output during acceleration, then

$$\text{H. P.}=\text{constant}=(\text{force to cause acceleration})\times\frac{V}{550}$$

Or

$$\text{H. P.}=\text{constant}=\text{mass}\times\frac{dv}{dt}\,\frac{V}{550}$$

And this is an equation of a parabola.

Let F mean the force to cause acceleration in one interval in Fig 3, and V the velocity, and let F_1 equal the force to cause acceleration in one other interval and V_1 the velocity, then

$$F\times V=\text{constant}$$

$$F_1\times V_1=\text{constant}$$

This equation of a hyperbola referred to its asymptotes will represent the increase of resistance.

To prove that this curve in Fig 3 is geometrical progression, it is necessary to plot it over on logarithmic paper. On this paper it should appear as a linear function. In Fig 5, the ordinates are the values of the velocity and the scale used is a logarithmic scale of the slide rule. The ordinate signifies the resistance in pounds on the same scale. On this diagram, if we take equal steps between gears taken, between any chosen points, then they will give us a geometrical progression.

If we take a pair of dividers and make steps on the scale, as in Fig. 4, such reading will give us geometrical progression. To get any number of gear ratios between a chosen lowest ratio and to the direct drive, all that is necessary is to divide the slide rule into as many equal spaces as we want intermediate speeds. If we begin dividing at the point which is our lowest gear and take the readings where the dividing points come, we will get the correct theoretical gear ratios. This division may be subject to change during process of designing, on account of inability to secure even center distances and pitch.—S. I. Fekete.

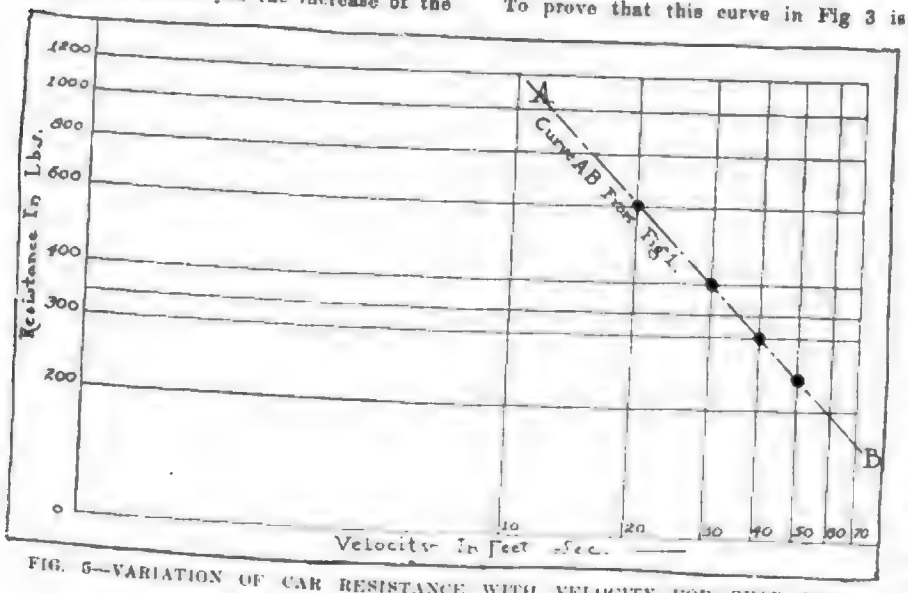


FIG. 5—VARIATION OF CAR RESISTANCE WITH VELOCITY FOR GEAR RATIO DETERMINATION

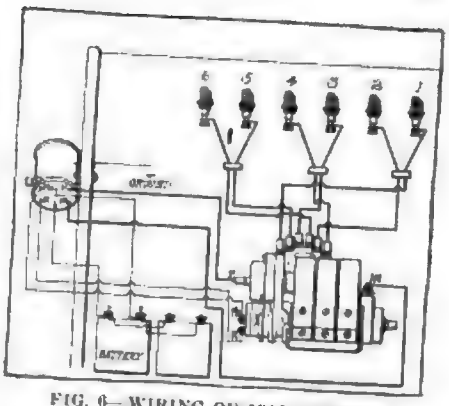


FIG. 6—WIRING OF 1910 WINTON

WINTON WIRING

Bedford, Ohio—Editor Motor Age—I am very much interested in knowing how the 1910 Winton with the Eiseman magneto and storage battery is wired, and will appreciate this information in a future issue of Motor Age.—J. F. Taylor.

The Winton wiring diagram appears in Fig. 6.

COST OF REMODELLING KISSEL

Louisville, Ky.—Editor Motor Age—I have a model D9 Kisselkar. What changes would be necessary to make a two-passenger speedster out of it, and also the approximate cost?—A Reader.

To remodel a D9 touring car, the old body will have to be replaced with the new one, and the angle of the steering column adapted to the lower driving position of a runabout body. A good roadster body for this car may be built for about $175, or a regular Kisselkar body bought for $200 f. o. b. the factory. The total cost of such a change will probably amount to $250. Detailed instructions may be obtained of the Kissel Motor Car Co., Hartford, Wis., or the Chicago branch.

Chauffeurs' Examination

What London Commercial Drivers Are Expected to Know Before Given License

AGRICOLA, KANS.—Editor Motor Age —This clipping is from the New York Sun, I think to reprint it with replies to each question would be of deep interest.

"There must be rather a higher grade of commercial vehicle driver in London than in New York, to judge by an examination paper for a prize offered by the Commercial Motor Users' Association not long ago. The prizes amounted to $50, $35 and $25 respectively, and there were sixty competitors for the money. Here is what was asked of the men who drove gasoline vehicles:

"1—Give a brief description of the vehicle you drive.

"2—Describe how you would time your engine if you had to reassemble it, there being no marks to guide you. At what parts of the stroke do the inlet and exhaust valves open and close? State in each case whether the piston is going up or down in the cylinder, and at what point does the ignition occur?

"3—Explain exactly the cause of an engine popping back into the carbureter, and what you would do to stop it.

"4—If the float of your carbureter developes a leak, how would you detect it, and what effect would it be likely to have on the engine? Give a sketch and describe some form of carbureter with which you are acquainted, and state what you know of its means of adjustment. How may gasoline be saved, firstly, by method of driving, and secondly, by adjustment of carbureter?

"5—Explain the various causes of knocking in an engine, and give the causes of big end failures.

"6—State, as far as you know, all the causes of engine overheating.

"7—What parts of your machine are likely to need replacing after the following mileages have been covered: 10,000, 20,000 and 30,000?

"8—A van runs 300 miles a week and consumes the following stores: 1 gallon of gasoline, at 25 cents a gallon, for each 7½ miles; 1 gallon of oil, at 50 cents a gallon, for each 250 miles; tires cost $375 a set, and run 12,000 miles; other expenses including wages, $16.92 a week. What is the cost of the vehicle per mile?

"9.—Sketch and describe a differential gear. What is the object of fitting such a gear, and would anything serious happen if it seized while traveling along a straight line?

"10.—What is the difference between a high-tension and a low-tension magneto? Give a detailed diagrammatical sketch of any type. Why do you only need one wire to connect up a low-tension magneto to a multi-cylinder engine?:

"11—Some makes of vehicles are fitted with one set of brakes on the back wheels, and the other on one of the gear shafts, while others have both sets acting directly upon the road wheels. Which type do you prefer, and give your reasons?

"12—What do you consider is the best form of final drive to the road wheels for vehicles of the following load capacities: 30 cwt., 3 tons and 5 tons? Give your reasons."—F. L. Williams.

1 and 2—The first and second questions are pertinent to a particular car, but as a general rule, in regard to the second question, the exhaust valve should open from 35 to 40 degrees before dead center on the down stroke of the piston. It should close on dead center on the up stroke. The inlet should open practically simultaneously with the closing of the exhaust, and remain open until the crank is from 20 to 50 degrees past bottom dead center. Ignition takes place on dead center, or a shade past it when retarded, at the top of the compression stroke.

3—The usual cause of popping back into the carbureter is leaky inlet valves. This may be the result of poorly seated valves, or of a weak spring. To remedy

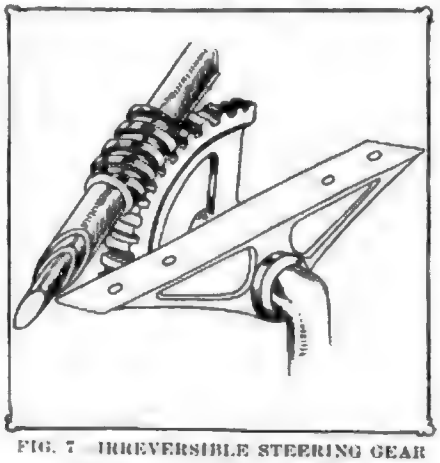


FIG. 7 IRREVERSIBLE STEERING GEAR

this trouble, either the valves should be ground, or a new spring be fitted, as the case may be.

4—A leaky carbureter float of the metallic type would betray itself by permitting the carbureter to flood, resulting in overflow of the gasoline from it, and an over-rich mixture for any but starting speeds. The result would be bad missing or stoppage of the motor and an evil smelling exhaust. The adjustment of carbureters has been described in these columns numerous times, and reference to such description is requested.

5—Knocking is caused by loose bearings; too early spark for the speed of motor, as under severe load; broken piston rings; overheated motor, causing pre-ignition; motor loose on frame or loose connection; a loose commutator will sometimes cause knocking, as will a bad carbon deposit, uneven compression and poor lubrication.

Big ends, or crank bearings, are deranged either by lack of sufficient lubrication, improper alignment or overloading the engine.

6—Overheating is caused by lack of water, obstructions in the water line, pump failure, stoppage of fan, running continuously on too low a gear, racing the motor, running on a retarded spark and an open throttle, overloading, carbon, deposit in cooling passages or radiator, poor mixture, imperfect valve timing, hot bearings due to disalignment and imperfect lubrication.

7.—Interpreting this question as in reference to parts surviving for that amount of travel, the parts most likely to require replacement after 10,000 miles of running are: Clutch facing, parts of wiring, fan belt, brake shoes, contact points on timer or contact-breaker of magneto, such parts as spark plugs and equipment accessories being of uncertain life, although they probably would need replacement in this time. After 20,000 miles the valve springs probably would have lost their elasticity to some extent, and the valves are likely to have been worn down to a point where replacement would be advisable; some types of steering gears would require new wearing surfaces, another facing would have been worn off the clutch, new brake shoes would be needed, rewiring would be advisable, a new belt would be required on the fan, the magneto would need minor replacements, new crank bearings might be needed and new crank shaft journals. The piston rings might by this time need to be replaced, and various gaskets, etc., would have outlived their usefulness. After 30,000 miles all of this would be required again, in all likelihood, and in addition, the cylinders would greatly profit by regrinding, and consequent renewal of the pistons. The camshafts would in some cases have to be replaced, as 30,000 miles of running would have worn them until they no longer opened the valves properly; new wrist pin bearings would be needed, the water pump probably would be near its limit of usefulness and the ignition and lubrication systems would require more or less complete rehabilitation.

8—This is simple arithmetic and needs no editorial comment, the answer is 6½d per mile, or 13 cents per mile.

9—Bevel gear and spur-gear differentials have frequently been illustrated in these columns. This device is for the purpose of transmitting the torque of the drive shaft to the live rear axle or counter shaft, so as to permit the wheels to revolve at different speeds, or to permit them to run in opposite directions, without affecting the speed of the drive shaft, and always maintaining an average between the differential speeds of the wheels, equal to their speed if revolving at the same rate. The practical application of this result is to permit the car to turn corners, without causing any drag on the wheels, and transmitting the driving power to both wheels regardless

of differential speeds. If it seized while traveling along a straight road, in such a way as to drive both wheels positively at the same speed, no change in the direction or speed of the car would result, in fact, it would be temporarily advantageous. If, however, the course deviates from a straight line, in any particular, the wheels would drag and at any speed, cause serious skidding and undue tire wear.

10—A high-tension magneto is a magneto that unaided by external appliances, produces a high-tension or high-voltage current. A low-tension magneto is a magneto that produces a low-tension current, which must be raised to a high voltage by means of induction, outside of the apparatus. A low-tension magneto sometimes is connected to a multi-cylinder with but one outlet wire by using a single, non-vibrating coil, and a distributor.

11—On a chain-driven truck, both brakes should be placed on the rear-wheel drums, because, in case a chain breaks or climbs its sprocket, the counter-shaft brakes would become useless, and there seldom is time to reach the emergency lever in time to avert catastrophe, if in an emergency the running brake fails. On a shaft or worm-drive truck, a service brake on the drive-shaft is safe if properly designed, and by the action of the differential is applied to the wheel that offers the most tractive resistance, which is an advantage over equalized brakes on the wheels. However, such brakes are a strain on the differential. The best system seems to be to apply all four brakes on the wheel drums, equalizing them with cross-trees.

12—In regard to final drive systems, there is not sufficient positive data obtainable to warrant Motor Age in answering this, as all opinions are as yet more or less personal on this subject.

BAD MIXTURE DECEIVES

Toledo, Ill.—Editor Motor Age—I have a Reo 4-cylinder 30 horsepower car. My motor runs nicely on the batteries, but when I am running slowly on the magneto, and go to speed up, it runs on three cylinders, and continues to do so until I let my motor race for a few minutes. It runs nicely when all four cylinders work.

2—Would oiling my cylinders through the gasoline supply be a success on my car, and if so, what proportions should I use?

1—Since your magneto will perform properly when the motor is warm and has just been raced, it is evident that it is not at fault. The trouble is probably with your carbureter adjustment. You are able to get good firing from your batteries under all conditions, because your battery current is stronger than the magneto; and the mixture is near enough right so that it does not manifest its error until you attempt to accelerate with the relatively weak magneto spark, with your motor running slowly. The reason why your motor picks up on all four cylinders after racing it is because the racing process blows out the excess of gasoline, and the magneto spark at high speeds is strong enough to run on the rich mixture. Carefully thin your mixture, giving especial attention to medium speeds. Also accelerate gradually, as too rapid acceleration on any motor will cause irregularities.

2—The Reo motor may be satisfactorily lubricated through the fuel supply; in the proportions of one part of oil to five parts of gasoline. In making this change, the carbureter will require slight adjustment, to allow for the slight dilution of the gasoline, and its difference in gravity, when mixed with oil. This method, however, is of value only as a means of lubricating the valves and walls of the cylinders. Other forms of oiling must be employed to lubricate the crankshaft and connecting rod bearings.

NOISE IN CLUTCH

Washington, D. C.—Editor Motor Age—I am the owner of a 1912 Cadillac touring car and ever since I have had it have been annoyed by a chuckling or knocking noise which occurs under the car when the clutch is thrown out, as in coasting down hill, etc. I cannot locate the trouble nor can various mechanicians who have examined it, but as this same trouble has been noticed by other owners of this model, I hope you will be able to suggest the remedy.—Subscriber.

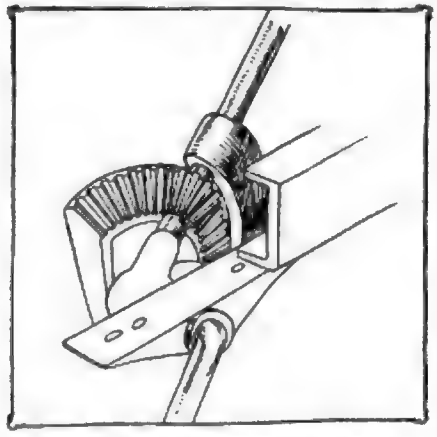


FIG. 8—NON-IRREVERSIBLE GEAR

The sound to which you refer is the result of play in the transmission parts, and does no harm. It is quite common in used cars and there is no remedy for it.

STEERING TYPES ILLUSTRATED

Plano, Ill.—Editor Motor Age—Please illustrate the most common types of steering gears of the two classes described in the issue of August 15.—Reader.

Of the non-irreversible types regarded with the most favor, the bevel-gear type, as in Fig. 8, is perhaps the most popular. Of the best accredited irreversible types, the worm and sector form, as in Fig. 7, is generally conceded as standard. Many variations in structural details, however, are to be found. These illustrations are merely for the purpose of showing operating principles

Dynamo Will Not Excite

Hoosier is Puzzled by Behavior of Small Direct-Current Generator

ALBION, Ind.—Editor Motor Age—I have a small direct-current generator, bipolar and shunt-wound with a drum armature, the commutator has 12 segments, the insulation on the wiring is good, the coils are alright, as they have been tested several times. The fields lose their magnetism and will not stay magnetized. The superintendent at the power house connected the fields in the exciter circuit for a couple of hours, the machine worked finely for a day or two and then refused to generate. It has been magnetized several times since, but will not last very long. It will refuse to generate after the armature stops and is started again. It will generate a hot spark when short circuited for an instant after it is newly magnetized.

The machine will work well by connecting the fields to a single dry cell, a very weak one will magnetize them in good shape. It is used for ignition work on a portable engine, the armature turning about 1,800 revolutions per minute. There is no name, nor any marks on the machine. It was formerly used on an Angola gasoline engine. It is an enclosed type.—Chas. M. Marquiss.

The trouble with this particular generator is probably due to the fact that the resistance of the shunt field circuit has been increased due to imperfect or dirty contacts between the connection of the field coils. It is hardly probable that the field magnet would lose all of its residual magnetism. It is more likely that the resistance of the shunt field circuit has been increased to such an extent that the small electromotive force which is generated by the residual magnetism is not sufficient to overcome the increased resistance in these fields. The connections between all of the field coils should be thoroughly cleaned and soldered. The field coils themselves should be tested for grounds by placing one terminal of a 110-volt circuit on the magnet and the other through a voltmeter and to contact with the field wire to determine whether there is any reading on the voltmeter. This will test for a ground from the field coil to the frame, which would offer a bypath for the exciting current of the coils and would prevent the machine from building up its voltage. The trouble is with your exciting circuit, which accounts for its good behavior when a dry cell is used for this purpose. Clean up your field coil contacts, and you should have no more trouble.

If however, it is found that after a thorough cleansing of the contacts the machine is still sluggish, they must be affected by obscure grounds or be worn or scored to such extent to be worthless, in which case replacement is the only remedy.

The Mathematics of Motoring

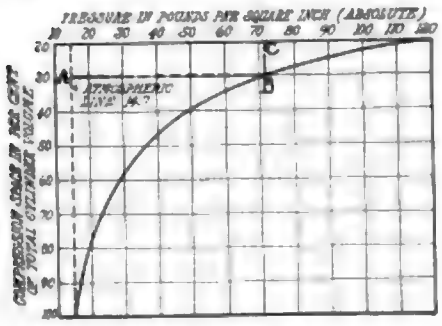


FIG. 1 CURVE GIVING COMPRESSION PRESSURE

Calculating Compression

CALCULATION of the compression of the gas in the cylinders of an engine has to do more with the designer than with the motorist, except for the purposes of comparison of a given motor with an ideal one. The compression pressure of any motor in actual use can be readily obtained by means of any of the pressure gauges marketed for the purpose, and which are designed to be screwed into the cylinder in place of the spark plug or pet cock. If, then, the theoretical compression for a motor of the same dimensions be calculated, a means of comparison is afforded which will show in a way the state of the motor under test; for the compression pressure in a cylinder is to some extent a criterion of its condition.

Compression in the cylinder of a motor is primarily based on the fact that the atmospheric pressure of every square inch of surface exposed is 14.7 pounds, so when a cylinder is filled with mixture on the suction stroke the pressure within that cylinder is 14.7 pounds to the square inch. Before stating definitely how compression is calculated, it must be remembered that pressure of a gas, or, in other words, its compression, is inversely proportional to the volume of the gas. For example: If we had a cylinder 10 inches long filled with gas at atmospheric pressure and compressed it into a cylinder 5 inches long and of the same diameter, the pressure of the gas would be twice as great, that is, 29.4 pounds to the square inch. If the gas in a 10-inch cylinder were compressed into one $3\frac{1}{3}$ inches long, or one-third of the size, the pressure would be three times as great, or three times 14.7 pounds. In the same way, if the gas in this cylinder were compressed into a space one-quarter the size, the pressure would be four times as great; or if into a space one-fifth the size, the pressure would be five times as great. This, however, is only on the assumption that the temperature remains the same throughout. But the temperature in the cylinder does not remain the same throughout the compression stroke and for any thing like accurate results must be taken into consideration.

From this the compression, neglecting temperature changes, may be computed fairly accurately as follows:

$$\text{Compression} = \frac{Vs + Vc}{Vc} \times 14.7$$

Vs = piston displacement in cubic inches.

Vc = combustion chamber displacement in cubic inches.

In this equation when the piston displacement is known for the cylinder and the desired compression is known by solving the equation, the combustion chamber volume in cubic inches can be obtained. Regarding changes in pressure, when the temperature is increased, for every 1 degree centigrade rise in temperature there is an increase in pressure of 1/273 pound.

To obtain the exact pressure that is developed by the compression of the gases in a cylinder is a rather difficult proceeding without the use of logarithms, for it has been demonstrated that the variation of the pressure with the volume in a gas engine very nearly follows the law

$$p\,v^{1.3} = P\,V^{1.3}$$

where p is the pressure at the beginning, that is, atmospheric pressure or 14.7 pounds per square inch absolute; v is the volume filled by the gas with the piston at the lowest point of its stroke; P is the maximum compression pressure; and V is the compression space in the cylinder with the piston at the highest point of its stroke.

That is, the compression pressure P in pounds per square inch is found by solving the equation,

$$P = p\left(\frac{v}{V}\right)^{1.3}$$

It simply means to divide the total volume of the cylinder by the compression space, raise the quotient to the 1.3 power and multiply by 14.7. The use of the exponent 1.3 requires the employment of logarithms.

In order to do away with the necessity of logarithms the curve, Fig. 1, has been plotted, from which the compression pressure can be read directly if only the percentage of the total volume occupied by the compression space be known. This is simply the cylinder volume less the piston displacement, and in commercial motors usually runs from 25 to 30 per cent of the piston displacement. The use of the chart can be explained best by an example.

Assume it is desired to find the proper compression in a cylinder of 5 inches bore and 6 inches stroke. The piston displacement is found by squaring the bore, multiplying by the stroke and then multiplying by .7854.

5x5x6x.7854=117.81 cubic inches.

The exact area of the compression space cannot be readily measured, on account of the irregular shape of the inlet and exhaust ports, but a sufficiently close approximation can be obtained by finding the area of the cylinder above the piston and adding 50 per cent for the passages. Suppose this was found to be 45 cubic inches in this motor. Then the total volume of the cylinder is 117.81 plus 45 equals 162.8 cubic inches.

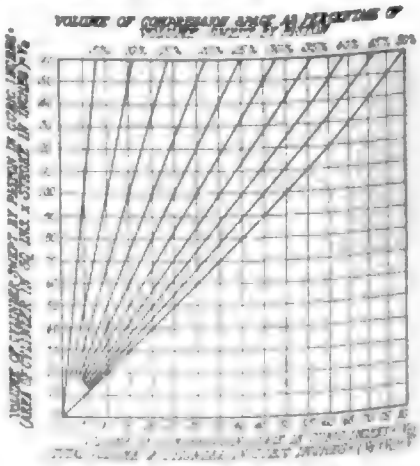
Then the per cent that the compressor space is of the total cylinder volume is

$\frac{35}{162.8}$ equals .295

or approximately 30 per cent.

So then, we enter the curve, Fig. 1, at the point marked A on the left, which corresponds with a compression space which is 30 per cent of the total volume of the cylinder, and go right on the horizontal line to the point marked B where the curve cuts the 30 per cent line, then vertically upward to the point marked C reading 71 pounds per square inch as the theoretical compression of the motor. This 71 pounds per square inch is absolute pressure and to reduce it to gauge pressure, subtract 14.7, giving 56.3 pounds per square inch.

Fig. 2 is a chart showing compression space as a per cent of the volume swept by the piston for different cylinder volumes and compression spaces. This was compiled by James Gunn and will assist in figuring the compression space percentage. From this, if the volume of the compression space, Vc, is known and the volume swept by the piston, Vs, the percentage can be read off directly.



RELATION OF COMPRESSION SPACE TO CYLINDER VOLUME

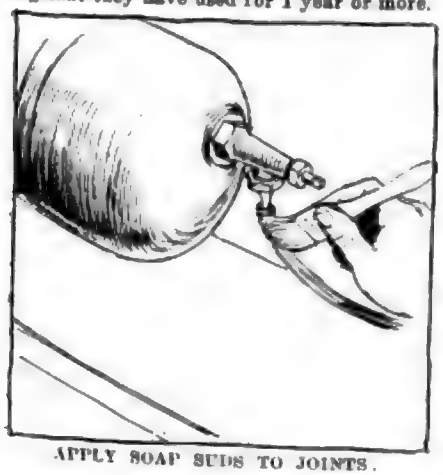
The Motor Car Repair Shop

Testing Lighting Piping

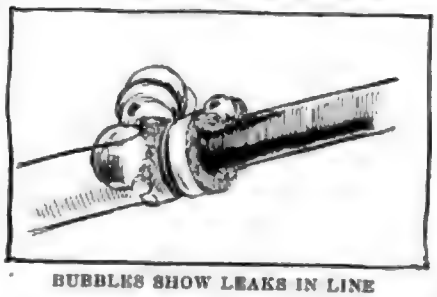
A LARGE proportion of users of gas tanks for acetylene lighting seems to be carelessly throwing away a considerable portion of the money expended on the light supply, through the use of leaky pipe lines. The result of a series of tests along this line has led the Prest-O-Lite company to establish a service station in each of the cities where the company now has a branch office. These stations are equipped to give free service to gas tank users in locating leaks and showing them how to deliver the full capacity of each tank to the lamps. However, not every owner has access to one of these service stations. For this class of users of gas lighting tanks the following directions for testing pipe lines will be valuable in preventing loss from leakage.

Leaking pipe lines are a frequent but needless source of waste. The trouble lies almost always in the carelessness of the user. Complaints of short measure and excessive gas consumption are always traceable to leaks. The peculiar feature of this is that if the owner will spend but a few moments in testing the tubing from the tank to the lamp, the waste will be eliminated, and in many cases the life of each tank of gas will be doubled.

First disconnect the rubber tubing at the lamps and pinch or clamp the ends tightly. Go over every inch of the rubber and brass tubing and each connection with heavy soap suds, seeing that every portion is thoroughly covered with it. Then turn on the gas. A leak at any place will be shown at once by the formation of a bubble. If it is formed at a connection, this should be tightened at once. If the bubble appears on any portion of the tubing (either rubber or brass) it is a sign that the tubing should be replaced or repaired. Rubber is a very treacherous substance and hardens and cracks very easily after exposure to air, heat and sunshine—yet some gas tank users are clinging to rubber tubing that they have used for 1 year or more.



APPLY SOAP SUDS TO JOINTS.



BUBBLES SHOW LEAKS IN LINE

The places where the rubber is joined to the brass tubing should be watched carefully, as they are a prolific source of leaks. Wherever the tubing is run through the frame or mud apron, it should be protected from wear. Very often leaks are found at such spots. The rubber tubing, however, is the worst offender and a few cents spent in putting in new rubber connections will often pay for itself many times over in gas saved. When all of the tubing and joints have been tested and connections to the lamps, the lamps themselves should be tried for leaks. Put soap suds around the base of the tip and on the stem which holds the tip and on the rubber tube joint at the lamps. Then turn on the gas and light the lamps. If bubbles appear at the joint in the stem inside the lamp, this stem should be unscrewed and the threads covered with white lead.

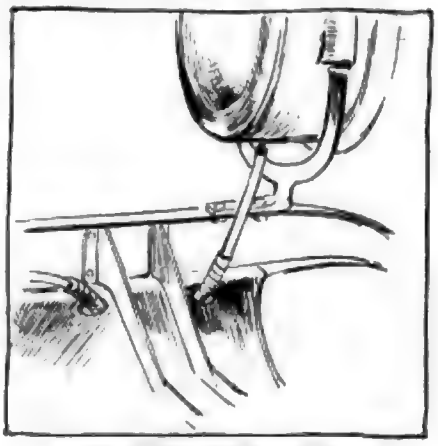
Every owner should make this simple test, whether he suspects a loss of gas from leaks or not—and it should be done three or four times a year, at least. Every gas tank is charged to full capacity and fully tested at our charging plants, and wherever a user seems to be emptying his tanks too rapidly, in nearly every case pipe-line leaks will be found responsible.

Replacing Pressure in Fuel Tank

When the supply tank of a motor car using pressure feed to the carbureter is refilled with gasoline, most motorists use the hand pump provided to replace sufficient pressure in the tank to get the motor started. Generally there is enough gasoline in the carbureter at all times to run the motor for several minutes, in which time sufficient pressure could be raised in the tank through the pressure feed from the exhaust in the regular way so that it rarely should be necessary to resort to the hand pump. On some cars employing pressure feed the hand pump is so rarely used that the washers in it dry up, and when it does become necessary to use it, it will not work. In such cases, the desired results often can be obtained by temporarily plugging the outlet of the exhaust pipe and then cranking the motor. This will create excessive pressure in the exhaust pipe which will be conducted through the regular pressure piping to the fuel supply tank. Thus a few turns of the crank will be just as effective as the pump when the latter is in good order.

Makeshift Tire Shoe

One of the most harassing kill-joys of the motorist who is driving in the country is the fear that one of his tires will blow out while he is without a blowout patch or other suitable means for making a satisfactory repair. The motorist of experience never will take chances of being stalled on the roadside or having to ride on the rim for lack of proper tire repair equipment, but as we are all inclined to be negligent at times, the recent experience of a local motorist may be of interest. A blowout occurred out in the country many miles from a source of supplies. An inside blowout patch would have made possible a very effective repair, but there was nothing of the sort in the car, and the driver decided to wait for a passing motorist, in hopes of borrowing this necessary article. Being an ingenious person, he did not wait long before a plausible idea shaped itself in his mind, and, leaving instructions for the rest of the party to hail the next car that might happen along, he went to the next farmhouse and managed to secure an old boot. From this a suitable blowout patch was cut, placed inside the casing over the hole, and, being of generous dimensions, enabled the party to be under way in a very short time. The hole in the casing was quite large, and an outside patch also was made from the same boot, to prevent the entrance of stones and dirt. The repair proved very successful, and put an end to what might have proved a long wait. In this case, ingenuity took the place of proper care.



PROTECT TUBING FROM WEAR

rce-Arrow Cars for 1913 Season

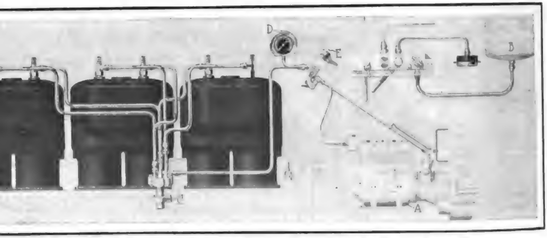
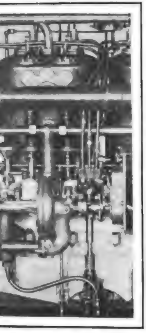


FIG. 1—DIAGRAMMATIC ILLUSTRATION OF PIERCE-ARROW COMPRESSED-AIR SELF-STARTING SYSTEM



AIR DISTRIBUTOR AND PIPES
otographic reproduction shows the utor on the top of the oil pump the air pipes leading to each of the rs. The clutch coupling between the nd the distributor makes the latter novable.

Host of Mechanical Changes but General Design Retained—Compressed Air Self-Starter Feature

erce-Arrow cars for 1913 are a al evolution of the present and models, the general design of not changed for the coming seaite of the fact that a host of l changes have been made. The continues its previous policy of der castings in all models, using ring crankshafts, not enclosing s, springs and tappets, and continues the use of a cone flywheel clutch, four-speed gearset, and other characteristics. Those familiar with the Pierce-Arrow this year will have little difficulty in recognizing the 1913 line, although body alterations have been made.

Changes Enumerated

While retaining the former general layout, the many mechanical changes made show a year of activity in the designing and drafting departments. Instead of the large oblong-shaped gravity copper oil tank above the cylinders, there is used a direct pressure system, the gear oil pump delivering direct to all of the crankshaft and connecting rod bearings. This change simplifies the general appearance of the motor. Compressed air self-starters are used, there being a four-cylinder air pump on the gearbox to maintain a pressure of 200 pounds in the air reservoir for the starter. This air pump is also used for tire inflation. . In addition in this self-starting means the company retains its present gasoline primer which consists of a plunger gasoline pump on the dash connected with the gasoline line and also with a spray jet in the intake manifold, so that one stroke of the pump injects sufficient gasoline into the manifold to facilitate starting. The compression release system is now fitted on all models and aids in facilitating starting.

There are numerous other changes which can only be enumerated here, but referred to in detail later: The cone clutch is fitted with a leather facing with cork inserts instead of the German bronze of this year. There is a double universal joint between the clutch and gearbox; the gearbox is 4.5 inches further to the rear, allowing of dismounting the clutch without disturbing the gearbox, and also making room for the air pump; the propeller shaft is a tube instead of a solid bar; the rear axles have been generally improved by making the drive shafts removable without dismantling the axle housing, and open bodies are of sheet aluminum instead of cast aluminum, the cast product being used in the closed types only.

The nomenclature of the three models for next year differs somewhat from that of this year. This year they are 36, 48 and 66, but for next year, 38-C, 48-B and 66-A. In addition, there is 48-D, which is a continuation of the present model 48 with the addition of an acetylene self-starter and an electric lighting outfit, together with other 1913 equipment.

Particulars of 1913 Models

The particulars of the three models are: 38-C, bore 4 inches, stroke 5.5 inches, runabout wheelbase 119 inches, four and five-passenger cars 127.5 inches, and closed models 132 inches. Tires are 36 by 4.5 inches all around. The gasoline capacity is: runabout 22.5 gallons, and four and five-passenger cars 24 gallons.

Model 48-B, bore 4.5 inches, stroke 5.5 inches, runabout wheelbase 128 inches, four and five-passenger car wheelbases 134.5 inches and closed types 142 inches, as well as seven-passenger cars. The runabout uses 36 by 4.5 inch tires all around and all others 37 by 5 inches. Gasoline tank capacities range from 22.5 gallons to 25.5.

Model 66-A, bore 5 inches, stroke 7 inches, runabout wheelbase 133.5 inches, four and five-passenger cars 140 inches, other models 147.5 inches. The runabout uses 37 by 5-inch tires and on all others

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he sizes are 37 by 5 inches in front and by 5.5 inches in rear.

ompared with this year, 38-C is the ly one to use larger cylinders, being sed from 4 by 5¼ to 4 by 5.5 inches, is calling for larger diameter valves, arger crankshaft and other parts and nsequently a higher horsepower rating. he cylinder sizes in the other two models ave not been altered.

tor Alterations

There are several minor motor changes, lthough the general symmetry of layout s unaltered. On the right side are the rburetor and magneto, the latter opposite the front cylinder casting. On the opposite side are four units, electric generator, oil pump, self-starter, distributor nd water pump. Leather disk couplings re used in the magneto and pump shafts n place of metal couplings. The disks are f ⅜-inch stock and 4 inches in diameter or the magneto and 3 inches for the water ump. The fan bracket is made with a crew adjustment to tighten or loosen the an belt, as needed. There are screw caps ver the valves in places of cover plates nd screws. Crankshafts are of greater iameter, connecting rod cap bolts are arger in diameter and many other similar inor changes have been made, showing he general care with which the entire otor has been gone over.

Fig. 1 diagrammatically illustrates the ompressed air self-starter, showing the ir pump A on the forward end of the earbox, the air reservoir B, which is loated horizontally above the muffler on he left side of the chassis, the air distributor C on the motor, which delivers he pressure to the cylinder in the firing osition, and also the pressure gauge G on he dash, and the control valve E for ngaging the air pump into operation whenver needed, it being understood that here is a jaw-clutch mechanism between he air pump and the forward end of the ountershaft in the gearbox, by which the ump can be operated when desired hrough a control lever on the footboard. he air from this pump is delivered into he tank where it is started at a pressure of 200 pounds. From this tank it s led to the air distributor. Fig. 3 s

WITH FOUR-CYLINDE

the sizes are 37 by 5 inches in front and 38 by 5.5 inches in rear.

Compared with this year, 38-C is the only one to use larger cylinders, being raised from 4 by 5⅛ to 4 by 5.5 inches, this calling for larger diameter valves, heavier crankshaft and other parts and consequently a higher horsepower rating. The cylinder sizes in the other two models have not been altered.

Motor Alterations

There are several minor motor changes, although the general symmetry of layout is unaltered. On the right side are the carbureter and magneto, the latter opposite the front cylinder casting. On the opposite side are four units, electric generator, oil, pump, self-starter, distributor and water pump. Leather disk couplings are used in the magneto and pump shafts in place of metal couplings. The disks are of ¼-inch stock and 4 inches in diameter for the magneto and 3 inches for the water pump. The fan bracket is made with a screw adjustment to tighten or loosen the fan belt, as needed. There are screw caps over the valves in places of cover plates and screws. Crankshafts are of greater diameter, connecting rod cap bolts are larger in diameter and many other similar minor changes have been made, showing the general care with which the entire motor has been gone over.

Fig. 1 diagrammatically illustrates the compressed air self-starter, showing the air pump A on the forward end of the gearbox, the air reservoir B, which is located horizontally above the muffler on the left side of the chassis, the air distributor C on the motor, which delivers the pressure to the cylinder in the firing position, and also the pressure gauge G on the dash, and the control valve E for bringing the air pump into operation whenever needed, it being understood that there is a jaw-clutch mechanism between the air pump and the forward end of the countershaft in the gearbox, by which the pump can be operated when desired through a control lever on the footboard. The air from this pump is delivered into the tank where it is started at a pressure of 200 pounds. From this tank it is led to the air distributor, Fig. 2, located on the left side of the motor between the water pump and lighting dynamo and driven by a continuation of the vertical oil-pump shaft. From the air distributing housing piping leads to special connections in the cylinder heads, each of these containing a check valve. The control of the apparatus is from the floor board, where there is also located a gauge to show the air pressure in the tank. The air distributor is a rotating disk having a crescent-shaped slot. The air supply enters the cover of the distributor centrally and the air delivery pipes enter the distributor case beneath the disk. As the disk rotates its slot registers in firing order with the different cylinders delivering the air pressure to the one in correct position and to the other in sequence, so as to give a continuous turning movement to the crankshaft.

New Pierce Air Pump

A new design and position of the air pump is shown in Fig. 4 on the forward end of the gearboxes, and Fig. 3 is a vertical end or side section of it. The pump is a Pierce product and is a 4-cylinder air-cooled design. The cylinders, 1 7/16-inch bore and 1¼-inch stroke, are formed in one casting. The crankshaft is ⅝-inch bar on which are mounted the four eccentrics which take the connecting rods. The pistons carry one eccentric ring with diagonal split at the upper end and have large rectangular perforations midway of their height. In each cylinder head is an automatic discharge valve forming a connection between the pump cylinders and the collector tube in the casting head. There is a fifth automatic valve in the delivery tube to the tank reservoir, this valve being located immediately above the valve for the front cylinder. The pump operates on the two-cycle principle, there being drilled in the cylinder walls a series of small holes at a point immediately above the piston head at the lowest point in its stroke, these holes appearing in the second cylinder. The pump has an overall length of 10 inches and a height of 8 inches. For tire inflation work it is recommended to take the air direct from the pump instead of from the 200-pound reservoir on the chassis over the muffler. This is owing to the possible danger of bursting tires by using the reservoir pressure.

Fig. 5 diagrammatically illustrates the

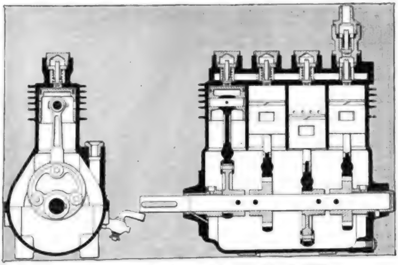


FIG. 3—VERTICAL SIDE AND END SECTION OF AIR PUMP

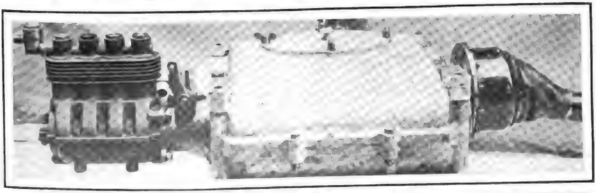


FIG. 4—GEARBOX WITH FOUR-CYLINDER AIR PUMP ATTACHED TO FORWARD END AND CLUTCH DRIVEN FROM THE SHAFT

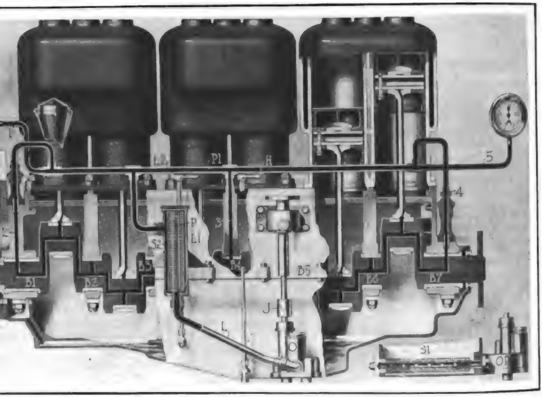


FIG. 5—IMPROVED PRESSURE OILING SYSTEM ON 1913 PIERCE-ARROW CARS

ressure feed oiling system of
which delivers oil to all crank-
connecting rod bearings at a
20 pounds. As formerly, there
splash system created by the
eans of connecting rods dip-
n oil level, rather the pressure
it all. The oil pump OP de-
ugh a duct to a filter screen
this to a distributor pipe P1
the top of the crankcase. This
delivers through a branch 1
ing gear, through a branch 2
at crankshaft bearing, through
to the middle crankshaft bear-
h a branch 4 to the rear crank-
ng, and through a continuation 5
ure gauge on the dash. The pres-
pounds to all parts. Each con-
d is fitted with a small copper
g. 6, which leads the oil to the
ist pin. The crankshaft is
drilled so that branch No. 2
ne wrist pins for cylinders 1
also the bearing B2. Branch
plies oil to bearings B3 and B4
s to the connecting rods for
cylinders. Branch No. 4 sup-
crankshaft bearings B6 and B7
or the connecting rods for the
ylinders. While there are three
namely, branches 2, 3 and 4, to
he crankshaft bearings, it has
onstrated in tests that one of
nches is sufficient to furnish oil
the crankshaft bearings and the
cting rod bearings, this being

due to the continuous oilway from end to end of the crankshaft and the pressure of 20 pounds generated by the pump. A double precaution has been taken in the matter of screening the oil between successive circuits of the motor. There are two strainers S1 surrounding the suction pipe through which the pump draws its supply and S2 in the discharge pipe. Both can be readily cleaned, that on the suction side of the pump by removing a plug in the face of the crankcase, and the one S2 by the hinged cap of the chamber L1 in which it is located.

No Excess Oiling

Heretofore the Pierce company has used baffle plates in the open ends of the cylinders to prevent an excess of oil being splashed, but for 1913 these baffles will not be used, the reason being that with a new pressure oiling system delivering oil up the connecting rods there will not be that amount of oil thrown off the crankpins, and so an excess will not reach the cylinders. The provisions of this year for oiling the forward bearings of the camshaft and magneto shaft are continued, and consist in branches from the pump lead 1 being carried to these respective shafts. Two commendable improvements in the field of accessibility is carrying the shaft for the drain cock up to the top of the crankcase at H1 and also that for the oil level test cock up to the point H2, making it possible to open each of these without having to reach down among the motor parts. The oil pump is entirely external and is readily removable by means of the jaw coupling J. Its shaft is continued upward, carrying on its upper end the air distributor for the self-starting system.

The new carbureter is a double-jet one. The two nozzles, N and N1, Fig 7, are

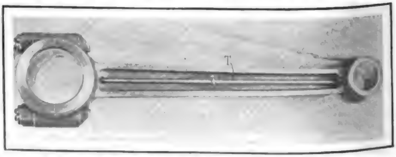


FIG. 6—THE OIL IS LED UP A TUBE TO THE TOP OF THE CONNECTING ROD

located respectively in the center of the eccentric float and in the auxiliary air passage. Both are controlled by hand-adjusted needle valves and are so positioned that the auxiliary nozzle does not come into use until a speed of 800 revolutions per minute is obtained and the auxiliary air valve has opened. Using the two nozzles gives a better carbureter performance on low-speed work and also on high-speed work than was obtainable with the single jet type used to date. Thus there is a high general average on low, medium and high speeds due to the double jet combination. An admirable improvement has been made in the needle valve NV in the main nozzle. This valve has a 19-degree taper on its upper end and to protect this taper there is an enlarged fluted portion F serving as a guide to insure the point of the needle centering in the opening of the nozzle. There is a second protection for the coned tip by way of a shoulder H on the valve. The valve is of double threaded diameter, the portion above the shoulder of small diameter, that beneath the shoulder of larger diameter, and the shoulders so positioned that when the valve is set tight on the shoulder the tip of the cone is in its proper closest adjustment. This protection removes the possibility of destroying the cone tip by screwing it up against the opening in the nozzle.

Auxiliary Air Intake

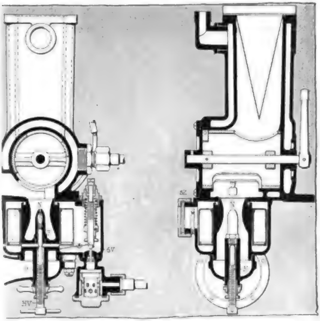
The auxiliary nozzle is a similar cone tip hand-adjusted needle valve. The operation of this nozzle is closely connected with the auxiliary air valve which has not been changed. The valve consists of two sets of reeds or vertical leaf-shaped springs. The outer set R1 is the weaker, and opens partially. For further opening the reeds bear against the inner set R, which are stiffer, thereby giving a progressive opening to the auxiliary air supply. A still further progression is obtained in that one

PIERCE-ARROW MOTOR FO

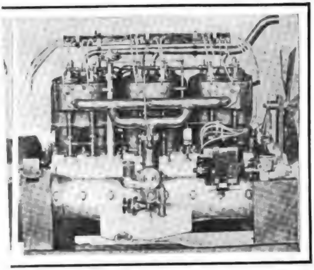
s weaker than the other,
lightly in advance. This
ie two reeds R.
ystem has a season regu-
pipe AA a hot-air tube
pipe connects. Surround-
nular space formed by a
ıner end of which has a
openings Z1. There is
circle of openings in the
it this point, so that by
ig Z by hand and pulling
the tension of the spring
of holes can be locked in
of register and thus regu-
f cool air which enters
in the housing. In hot weather the holes Z1 are in complete register, admitting the maximum of cool air; in cold weather the holes are out of register and the entire air supply taken from the hot-air pipe through the opening AA. The air supply through the auxiliary valve is always cold.

Gasoline System

The gasoline system in the carbureter remains much as heretofore, but the controlling valve has been redesigned. It has beveled seat GV, with a vertical small diameter guide projecting downward from it. This seating rests in a corresponding bevel in the casting. Both valve and seat are ground with pumice stone. The valve is of meteor metal, which is



7 TWO VERTICAL SECTIONS OF NEW CARBURETER



Y CARBURETER, LIGHTING GENERATOR, AND SELF-STARTER

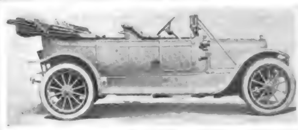


FIG. 9—MODEL 38-C FIVE-PASSENGER TOURING CAR

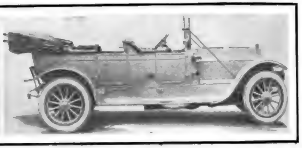


FIG. 10—MODEL 66-A SEVEN-PASSENGER TOURING CAR

largely nickel, much harder than brass, and so proof against cutting or wearing. To show the gasoline level a bull's eye BZ is placed in the side of the float chamber and in it is a vertical gauge rod on which the proper level of gasoline is indicated.

Clutch and Gearset Design

Leather, with cork inserts, for the facing of the cone clutch, has been used in place of German bronze in that it is lighter and so makes gearshifting easier, as the lighter the cone the more readily will it adapt itself to the gearset speed.

Another clutch improvement which is closely associated with the control parts of the car consists in mounting the clutch rocker shaft on two brackets which are attached to the rear cross support of the motor, this support being an I-beam forging. This year this rocker shaft is supported on the side members of the frame, but in its new position its easy operation is insured in that should the side members of the frame warp, due to road irregularities, there is no danger of it interfering with the easy operation of the clutch.

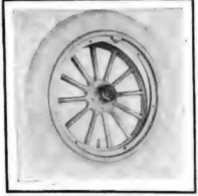


FIG. 11—PIERCE DEMOUNTABLE RIM

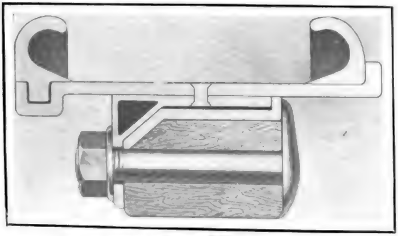


FIG. 12—SECTION OF PIERCE-ARROW DEMOUNTABLE RIM

The four-speed gearbox, which has been a standard of Pierce construction for several years, is continued in improved form. All of the main shafts are fluted designs, six flutes on each. The rear end of this shaft, where it takes the universal joint member, is also similarly fluted. Both ends of the main shaft are provided with self-adjusting glands to prevent oil leakage. These consist of a packing compressed by a small plunger backed up by spring. The entire stuffing box construction is contained within a cap which holds the bearing in place. Similar stuffing boxes are not used on the countershaft in that there is a bearing cap at the rear end which does not offer any chance for oil escaping, and at the forward end of this shaft the housing of the air pump clutch forms an oil-proof connection with the air pump housing. A new form of interlocking device is used to prevent engaging two trains of gears at the same time. This is an automatic arrangement consisting of a small vertical roller located between the two shifter rods. A slight groove is cut in the adjacent side of the shifter bars at this point, and the width of the roller is such that when resting in one groove the other shifter bar is free to move, but there is not sufficient room for the roller should both bars be removed at the same time. With this simple protective measure the old form of interlocking bolt and quadrant type used to insure the clutching being disengaged before gears could be shifted has been eliminated. There was a time when the company considered such protection necessary, but that time is now past.

1913 Transmission Members

Tubular construction has been used in the propeller shaft because of lighter weight and greater strength, there being a reduction of 15 per cent in the weight when compared with solid shafts with increased strength. The added strength is due to the larger diameter which prevents whipping of the shaft and thereby eliminating chattering in the universal joints as well as in the gearbox. On model 66-A the shaft is 2⅛ inches in diameter and of 5/16 stock. A neat method of lubricating is employed for the rear end of the shaft where it takes the sliding joint. The shaft carries six flutes or splines and within it is a packing piston, the forward end being made up of a leather disk between two metal washers, while the rear end is a metal plate fitted against a shoulder on the end of the shaft. Through a plug the chamber between these ends is filled with lubricant which works out through the drilled holes in the shaft. In this particular the hollow propeller shaft is of special merit, as it facilitates and insures adequate lubrication of the slip joint.

On all models the rear axle drive shafts may be withdrawn without dismantling the axle housing. Heretofore, excepting the 66 model, the differential pinions have been keyed to the axle shafts, making withdrawal impossible. The construction is now a floating design on all models, but the removal of the driveshaft calls for the removal of the road wheel together with the Timken bearing supporting the outer end of the axle. There is a flange against which the bearing rests and by which

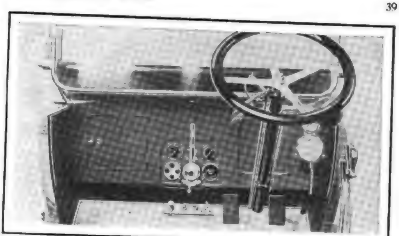


FIG. 13—GENERAL SCHEME OF DASH WITH TOOL COMPARTMENTS

means the end thrust is absorbed. Axle driveshafts are one-eighth larger in diameter and are fluted at the inner and outer ends instead of being keyed at the inner ends and provided with taper and key at the outer end. On model 66A ten splines are used on either end of the shaft, whereas models 38C and 48B use six splines. For 1913 all models will use a heavy black liquid oil for the bevel gears instead of axle grease. This has called for the introduction of packing glands at either side of the differential to prevent oil working out and getting on the brake drums and wheels. There is a gland at each side, consisting of No. 109 Crandell diagonal packing, which is held between a steel washer resting against a shoulder in the axle sleeve, and a threaded nut at the inner side. As the nut is threaded against the packing the diagonal split allows the halves to gradually slide up against each other, forming a tighter joint. The use of liquid as a lubricant is due to the fact claimed that with axle grease under continuous running at high speeds the grease is thrown off the pinions by centrifugal force and has not time to come back to them.

The axle housing remains practically the same as heretofore and consists of bell-shaped halves to take the differential, these being steel castings, into which Shelby steel tubing, which forms the axle sleeves, is braced and riveted in place. A new and longer pinion housing is used and is fitted with two Hess-Bright bearings to support the shaft. These bearings are now farther apart and the rear one is larger than in previous years, to hold the pinion up to its work better.

Electric Lighting System

The Westinghouse generator mounted on the motor left rear and driven through a continuation of the water pump shaft runs at motor crankshaft speed and will generate sufficient current at 12 miles per hour to supply the lights. The generator weighs 38 pounds and is sufficiently compact as not to interfere with valve spring accessibility for the front cylinder casting. It discharges into an 80-ampere-hour Exide battery and supplies a lamp equipment made up of 20-candlepower headlights, 4-candlepower dash lamps, one 4-candlepower tail lamp, a 4-candlepower license lamp and a 1-candlepower gauge light on the dash. All lights take a 6-volt current. The generator is fitted with a magnetic clutch which prevents the battery discharging through the generator when idle. On open cars the amperage consumption for the entire lamp equipment is 10.5 amperes and on the enclosed and suburban types, which have dome and side door lights, the consumption is 11.75 amperes. The wiring is all in copper tubes and the single-wire system is used, that is, the wire leads to the lamp filament and the other end of the filament is grounded. This wiring system for lights is simpler than the double-wire one and permits of a stouter lamp construction. A feature of the generator is that the current is sent through an iron resistance which regulates the voltages and protects the bulbs.

Body and Equipment Changes

All three models use the same general body lines as this year, but the runabout models are roomier, the front seats being 2 inches wide over all. All models are fitted with the new Pierce-Arrow demountable rims in which the wood felloe is beveled to approximately 45 degrees at one side, this bevel extending one-third distance across the felloe top. Over this is fitted a metal band which receives a corresponding band electrically welded to the inner side of the rim taking the tire. A series of six transverse bolts draws the rim's beveled surface up on the band level so that the transverse bolts are not called upon to carry any of the radial load. There is a radial projection on the rim bevel which is brought up tight against the outer side of the wood felloe and at the same time the rim is brought up against a shoulder on the felloe band at the inner side of the felloe.

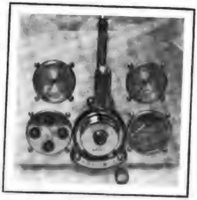


FIG. 14—THE VARIOUS DASH GAUGES

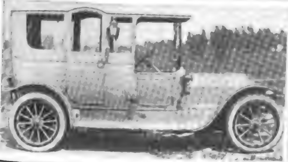


FIG. 15—PIERCE-ARROW BROUGHAM TYPE

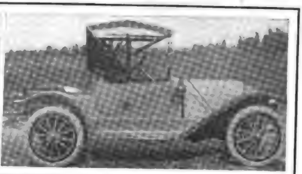
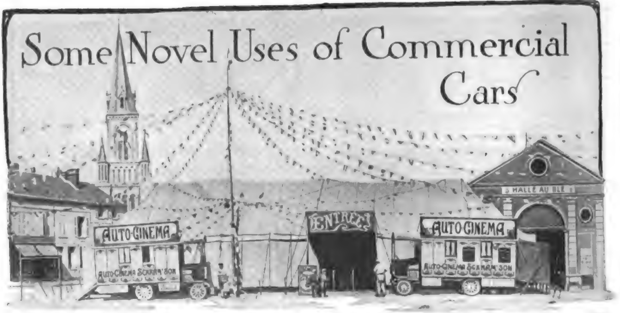


FIG. 16—THE STANDARD 1913 RUNABOUT TYPE

Some Novel Uses of Commercial Cars



General scheme of moving picture show, in which entire paraphernalia is transported from town to town on motor vehicles. On the vehicles are generators to furnish electric lights for the complete outfit as well as power for same

THE jaded, worn-out horses which have always been an indispensable part of the traveling theaters and variety entertainments so common in most countries of Europe are likely to be withdrawn from further service as the result of an example set by M. Sekramson. In common with all others in his profession, Sekramson used teams of horses for transporting his two theaters. His method of operating was to leave his winter quarters in the suburbs of Paris early in the spring and to make a tour of 3,000 to 5,000 miles through France during 6 months of the year. He possessed two theaters, one seating 500 and the other 1,000 persons, and each one had its own route. For the past few years the kind of entertainment provided was cinematograph exhibitions, with the accompaniment of music.

Under the reign of the horse fourteen animals were required for the two theaters, their cost in food being about 60 cents each per day. On an average six of the fourteen horses were lost every year, being at the rate of one horse per month sold as unfit for service, or killed. Further the horses had to be bought during the spring months, when prices are high, and sold off at the beginning of the winter, when prices are low.

Dissatisfied with the results obtained from his horse teams, Skramson a couple of seasons ago decided to make use of motor cars exclusively. For his small theater he purchased four 15-horsepower de Dion-Bouton chassis, one of which was fitted with a closed body having elaborate living accommodations and means for converting it into an advance booking office; another was a closed van with dismountable sides used for transporting the machinery, and the third and fourth were ordinary trucks carrying the tent, seats and other material necessary for the theater. These two vehicles remained empty when the theater was erected. In addition there were a couple of 8-horsepower generating sets providing the necessary current for lighting the theater, and two small touring cars, one of which carried the manager and his assistant and the other the orchestra of four performers.

Austrian-Daimler car fitted with body especially designed for wireless telegraphy in the army. The car has a dynamo which supplies current for searchlights and also the high frequency dynamo for the telegraphy outfit

The large theater was carried on three de Dion-Bouton 30-horsepower trucks, each one having a capacity of 5 tons. One was a comfortable caravan with sleeping accommodations for owner and assistant, and a compartment set apart as booking and general office. Another closed van carried the cinematograph apparatus and a 12-horsepower generating set for lighting the theater, and had also sleeping accommodations for two mechanics. The third was an ordinary truck with platform body on which was mounted all the material necessary for the theater. As in the case of the small equipment there were two touring cars for carrying the staff.

At the commencement of the season each theater was given a route to be followed during the following 6 months, with orders to stay one night only in each town. Erecting the theater would occupy from 1 to 2.5 hours, according to the ground availa-

ble. The performance began at 9 o'clock and finished at 11:30. Half an hour later everything would be dismounted and the entire troupe would have retired for the night. At 9 o'clock next morning the team would be on the road for the following town, from 12 to 15 miles away, the journey being made in 1 hour to 1.5 hours. When the theater had been erected, an advertising round of the town would be made with the orchestra as an attraction, and both cars liberally decorated with posters. The sensational visit announced, it was only necessary to await the arrival of the crowds at 9 o'clock, give the entertainment, and move along next day.


Interior of Austrian-Daimler car, showing arrangement of electrical apparatus for wireless telegraph outfit

The adoption of mechanical traction has proved successful in every respect. Not only can a greater amount of ground be covered in a much shorter time, but the cost of operating is less than with horses. A journey of 12 miles, which is the average distance between towns, entailed an expenditure of $8.40 for food for the horses. A journey of 12 miles, which is the average distance between towns, entailed an expediture of $8.40 for food for the horses. The four motors attached to the small theater cover the same distance at a cost of $2 for gasoline and oil. The initial outlay is greater, but the annual depreciation is less than the loss on the sale of the horses, and according to the proprietor of the theater the use of motor cars constitutes a valuable advertising asset.

MOTOR CARS AND THE WIRELESS

The Austrian corps of engineers has been recently equipped with a transportable military station for wireless telegraphy according to the musical-quenched-spark system of Siemens Brothers. This may be said to embody a remarkable and most promising advance in so far as it is mounted on a motor car with which it is combined to a transportable system, the car motor serving at the same time as prime mover of the current generator.

The Austrian Daimler Motor Co., which already has constructed a number of similar military vehicles in connection with which the motor at the same time served to drive the dynamo supplying current to huge search-lights, also designed this novel type of car. After throwing a claw clutch into gear by means of a transversal chain, the four-cylinder motor is made to drive the high-frequency alternating-current dynamo located below the driver's seat and its continuous-current exciter dynamo, thus producing the required energy of about 2 kilowatts.

The only distinctive feature of the motor is a self-acting regulator controlling any fluctuation in the number of revolutions for driving the dynamo and which is combined with a hand regulator intended for effecting any voluntary alteration in the number of revolutions in accordance with the various wave lengths required in wireless telegraphy. Both the generator dynamo and its exciter are, of course, readily accessible.

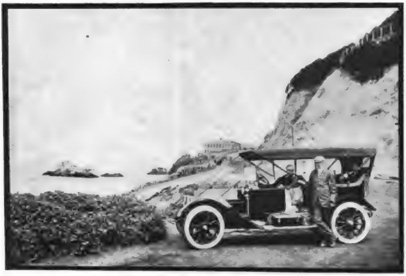
In the interior of the body, fitted with a light roofing and designed as light open box, the switchboard is arranged behind the driver's seat and at the same wall any apparatus of the sending and receiving posts. The antenna which is made is made up of a telescoping mast 100 feet in height and an umbrella-shaped network of wires, can be folded up within a few minutes to very small dimensions, so as to be carried on the roof of the car.

The seats are so arranged as to allow five men in addition to the driver and his attendant to be readily posted in the interior, three seats being arranged in the direction of traveling with a folding seat in the middle and two seats facing each other at both sides of the rear entrance. The three men seated in front are able in a comfortable posture to control all the apparatus. The inside of the car can be locked by folding blinds, which not only afford protection against bad weather, but keep away any outside noise as indispensable in recording wireless messages.

This is how a wireless station permanently in working order can be transported with a crew of seven men and at any speed up to 25 miles.

Motor-driven moving picture outfit, showing two enclosed vans, large truck, and two motor cars necessary for the operation of the outfit. This entire outfit has proven cheaper than horses

From the Four Winds



RICHARD SHELDON AND FAMILY OF TOLEDO, O., AT OCEAN DRIVEWAY, SAN FRANCISCO, AFTER TRANSCONTINENTAL TOUR IN CHALMERS SIX

CHURCHES Object to Cutouts—The churches of Freeport, Ill., have united to oppose the noise made by the open muffler and they asked for an ordinance which prohibits a car being driven in the city limits with the cutout open. Church services are seriously disturbed by passing cars.

Makes Long Trip—Boosting transcontinental touring for the amateur, Richard Sheldon, a Toledo, Ohio motor enthusiast, drove his Chalmers six into San Francisco recently, having made the trip from his home in 19 days, actual running time. Mr. Sheldon was accompanied by his wife and young son. The party now is touring in southern California.

Club Planned at Madison—Madison, the capital of Wisconsin, will organize a motor club before the end of August. A. M. Stondall, a wealthy resident of Madison and a former state senator, who was one of the leaders in the present good roads legislation, is at the head of the movement to organize Madison motorists for the first time. It is proposed to organize as a stock corporation and build a club house on one of the four noted lakes at Madison.

Awarding State-Aid Bids—The Ohio State Highway Commission has taken a new plan in the award of the state aid highways of the state. Instead of awarding the contracts in the various counties where the work is to be done, all future contracts will be awarded at the office of the highway commissioner in Columbus. The new plan will be tried for the first time August 22, when roads aggregating in value more than $200,000 will be contracted for. One of the new departures of the Ohio State Highway Commission in the improvement of the roads is concrete construction in preference to water-bound macadam. The former costs only 21 per cent more than the latter and is believed to be much more serviceable.

Mississippi Using Convicts—Not to be outdone by the good roads activity in Louisiana, Governor Earl Brewer, of Mississippi, has ordered work started on the first link of a model road that will connect the Tennessee border with the gulf coast. Four hundred convicts have been put to work on the roadway, which has been started at Indianola.

Swiss Bar Motorists—The latest restriction to Sunday motoring in Switzerland is the prohibition of the use of the roads in the canton of Schwytz by motorists between the hours of 8 a. m. and 5 p. m. Doctors and military authorities are exempt from this ruling. This order shuts off a number of well-known roads, including the famous Axenstrasse.

Wisconsin Roads Closed—H. J. Kuelling, county highway commissioner at Milwaukee, Wis., has issued notice of closing of most of the main trunk highways leading to Chicago and other cities on account of permanent improvements. The Kilbourn road, which is part of the Chicago-Milwaukee improved highway, is being rebuilt of concrete 16 and 18 feet wide. Loomis road, another trunk road to Chicago, will be closed from August 22 to November 15. Janesville plank road is closed for the season on account of concrete work; Mukwanago road is being graded. Watertown plank road, a principal exit from Milwaukee westward, is being paved with Kettle river sandstone and concrete and will be closed until the end of September.

Louisiana Has a New One—In order to be of more assistance to the good roads movement in Barbour county, Alabama, motor car owners in Eufaula have formed the Eufaula Automobile Association. The following officers were elected: T. L. Moore, president; C. B. Mercer, vice-president; J. Oppenheimer, secretary and treasurer.

Bars Young Drivers—An ordinance has been adopted by the city council of Coshocton, Ohio, requiring all drivers of motor cars within the city limits to be at least 16 years of age. The ordinance was adopted to prohibit young children driving cars through the streets. A fine of from $2 to $25 is provided for violation of the ordinance.

Ohio Registering Many Cars—The state of Ohio has been enriched the sum of $260,000 from the registration of motor cars and chauffeurs during the first 7 months of the present year. During the whole of 1912 the revenue was $190,000, while net profits for the first 7 months of this year is $70,000 in excess of that amount. Up to August 1 the number of number plates given out was 58,442, as compared with 45,000 for the whole of 1911.

New York's Club Strength—Figures just published showing the growth of the motor clubs in New York state outside of New York city are distinctly encouraging, demonstrating big gains over the previous year. Syracuse, with 945 members, stands third in the list, being exceeded by Buffalo, with 3,285 members, and Rochester with 1,603. Utica has 340 and Cortland 284. The smallest club in the state is Amsterdam, with seven members.

Marking Routes by Colors—The New York State Automobile Association, through efforts of Secretary Frank D. Lyon, is planning to designate through that state various highway routes by colors for convenience of motorists. The coloring process is to be undertaken by the New York state highway department and the various local clubs. Various colors will be assigned to the different roads through the state. The highway department probably will paint the top rail of all fences erected by the state highway division the specific color assigned to that road, and an 18-inch strip of color on bridges along the highways. A band of color is to be placed on telephone and telegraph poles along the highway and round color disks will be used on streets in cities to indicate the way to touring motorists. Later maps will be is-

sued by the state association showing the various colors allotted to the different routes and much confusion will be prevented when motorists have these guides for reference.

BOY FINDS NEW WAY TO STEAL RIDE ON PATHFINDER

New Wisconsin Club—The Crawford County Motor Association has been organized at Prairie du Chien, Wis., with forty members. Officers have been elected as follows: President, James Fischer; vice-president, F. J. Antoine; secretary, Harry Pomeroy; treasurer, O. A. Sherwood; directors, the officers and Dr. R. W. White, Oscar Bieloh, Henry Tilley and T. F. Claney. The club is located in the city which will be the western terminus of the proposed Across-Wisconsin highway from Milwaukee, on Lake Michigan, to the Mississippi river, at that point joining one of the across-the-state roads of Iowa.

Mexico Gets Busy—The recent organization of the Monterey Good Roads Association marks the inauguration of a campaign which has for its purpose the construction of a highway to run between the crossing of the Rio Grande at Laredo, Tex., and the City of Mexico, a distance of approximately 900 miles. It is stated that this good road movement not only has the hearty endorsement of President Francisco I. Madero, Jr., but that it is probable that the federal govement will lend material financial aid in the construction of the proposed highway. It is stated by engineers who have gone over the route that no serious construction difficulty will be encountered in accomplishing the project. There already exist several sections of old government roads that can be used as links in the through road, it is claimed. The different states and towns through which the highway will pass are giving their aid to the project and there is every reason to believe that it will be carried out. Special interest is felt by the Monterey Good Roads Association in the construction of the link between Monterey and Laredo, as it will give Monterey city a good road outlet to the United States via that international gateway.

Motorists Pick Up Stones—Motorists of Horicon, Wis., recently organized a party of fifty enthusiasts to pick stones from the highways leading into the city. Ten miles of road were cleared of rocks in 3 days. The stones were loaded on wagons and hauled to the city, where they will be crushed and used for macadam road building.

Kenosha Boosting—A. R. Hirst, state highway engineer of Wisconsin, was the principal speaker at the last meeting of the Kenosha Automobile Club of Kenosha, Wis. The meeting was devoted to stimulating interest in the proposed permanent improvement of that part of the lake shore road from Chicago to Milwaukee which lies in Kenosha county. A large part of the $6,400′ fund needed to build a concrete road on the sandy highway now existing has already been raised by popular subscription. The road will be 14 feet wide and cost $400 for grading and $6,000 for concrete.

BREAKING GROUND FOR CALIFORNIA'S $10,000,000 HIGHWAY

San Antonio Books Meet—At a recent meeting of the board of directors of the chamber of commerce of San Antonio, Tex., it was decided that a race meet will be held October 24, 26, 27, as a feature of the annual harvest jubilee. Prizes aggregating $3,000 will be offered. Dr. W. A. Hering, of the San Antonio Automobile Club, was selected chairman of the committee which will look after the matter.

Wisconsin Fees — Milwaukee county, Wis., will receive the sum of $17,420.82 as returns on the payment of motor registration fees to the state during the fiscal year of 1911-12. The registration law provides that after the secretary of state pays the expenses of administration of the registration division, the remainder shall be distributed pro rata among the counties. The counties must use the returns for good roads purposes.

Illinois Roads Marked—The Illinois Valley Automobile Association has been active in signboarding work, having just completed marking the Aurora-Ottawa-Starved Rock, Ill., route. Blue stripes are to be found on the telephone poles on this route via Oswego, Yorkville and Newark, while a white band directs the motorist through Plano, Sandwick and Somonauk, the latter being considered the better route to Starved Rock.

Cars in British Columbia—Figures supplied by the provincial police, who handle motor licenses, show that 3,568 machines have been registered in British Columbia. Of these it is estimated that about 1,800, or a little more than half, are issued from the Vancouver office, covering the city of Vancouver, New Westminster, North and South Vancouver and all the adjoining municipalities.

Current Motor Car Patents

PATENTS ISSUED AUGUST 13, 1912.

1,035,138—Vehicle Tire. Frank M. Ashley, New York, N. Y. Filed February 12, 1910. Serial No. 543,463.

1,035,150—Starting Device for Explosion Engines. Wilmur W. Boa and Karl Schoenbauer, Grand Rapids, Mich. Filed May 15, 1911. Serial No. 627,232.

1,035,152—Speed Transmission Mechanism. Leon J. Campbell, Chicago, Ill. Filed January 23, 1911. Serial No. 604,060.

1,035,155—Friction Transmission Mechanism. Harry B. Clark, San Francisco, Cal., assignor of one-third to Carlos P. Griffin and one-third to John J. Duffie, San Francisco, Cal. Filed August 28, 1911. Serial No. 646,514.

1,035,156—Lubricator. Robert D. Clark, Duquesne, Pa. Filed March 6, 1912. Serial No. 681,943.

1,035,167—Battery-Plate. Eben G. Dodge, South Orange, N. J. Filed December 26, 1908. Serial No. 469,240. Renewed November 4, 1911. Serial No. 658,617.

1,035,169—Speedometer Drive for Motor Cars. Emil R. Drayer, Richmond, Ind. Filed February 8, 1911. Serial No. 607,267.

1,035,181—Motor Car Wheel. Luther J. Graham, Richmond, Cal., assignor of one-half to Ananias Hill, Richmond, Cal. Filed May 29, 1911. Serial No. 630,004.

1,035,185—Valve for Pneumatic Tires. William P. Hammond, New York, N. Y., and Theodore A. Hammond, Passaic, N. J. Filed January 17, 1907. Serial No. 352,791.

1,035,207—Vehicle Wheel. John K. Libby, Malden, Mass. Filed December 15, 1910. Serial No. 597,416.

1,035,232—Starting Device for Explosive Engines. Winfield S. Regur, Des Moines, Iowa. Filed September 10, 1909. Serial No. 517,028.

1,035,284—Internal Combustion Machine. Emile Victor Reno and Joseph Alfred Chrysostome Bois, La Garenne-Colombes, France, assignors, by mesne assignments, to Sphinx Motor Co., New York, N. Y., a corporation of Delaware. Filed April 14, 1910. Serial No. 555,454. Renewed October 16, 1911. Serial No. 654,801.

1,035,246—Spring Top-Support for Vehicles. Frank X. Schad, Gainesville, Texas. Filed November 22, 1911. Serial No. 661,738.

1,035,252—Rotary Engine. Reinold V. Smith, Salt Lake City, Utah, assignor to Arvis Motor Co., Salt Lake City, Utah, a corporation of Utah. Filed September 10, 1910. Serial No. 581,394.

1,035,283—Self-Inflating and Non-Collapsible Pneumatic Tire. Frank F. Wear, San Francisco, Cal., assignor to himself, as trustee. Filed November 23, 1910. Serial No. 593,917.

1,035,332—Buffer for Motor Cars. Frederick C. Fehrman, Groffs Store, Pa. Filed September 22, 1911. Serial No. 650,677.

1,035,346—Friction Clutch. William J. Hilliard, Elmira, N. Y., assignor to Charles H. Knipp, Elmira, N. Y. Filed December 3, 1910. Serial No. 595,452. Renewed March 30, 1912. Serial No. 687,525.

1,035,356—Starting Device for Explosive Engines. Peter W. Kane, Chicago, Ill., assignor to Kane Machinery Co., a corporation of Illinois. Filed April 1, 1911. Serial No. 618,277.

1,035,367—Resilient Wheel. August Loock, Hayfield, Iowa. Filed May 29, 1912. Serial No. 700,500.

1,035,369—Mounting Bracket. Ray H. Manson, Elyria, Ohio, assignor to the Dean Electric Co., Elyria, Ohio, a corporation of Ohio. Original application filed August 14, 1911. Serial No. 643,829. Divided and this application filed March 29, 1912. Serial No. 687,143.

1,035,381—Chock. Thomas J. Moss, St. Louis, Mo. Filed April 5, 1912. Serial No. 688,818.

1,035,383—Starting Mechanism for Internal Combustion Engines. Pierre Antonio Painchaud, Plessisville, Quebec, Canada. Filed October 5, 1911. Serial No. 653,023.

1,035,391—Internal Combustion Engine Cylinder. Horatio S. Simpson, Fairbury, Neb., assignor of one-half to C. H. Shaffer, Fairbury, Neb. Filed December 2, 1910. Serial No. 595,276.

1,035,404—Vehicle Axle. Edwin E. Arnold, Detroit, Mich. Filed May 4, 1912. Serial No. 695,052.

1,035,410—Spring Wheel. Frank M. Beydler, Ashland, Kans. Filed June 24, 1911. Serial No. 635,034.

1,035,421—Hub-Bearing. Scott R. Coppins, Princeton, Ill., assignor of one-half to Sam S. Evans, Princeton, Ill. Filed May 26, 1911. Serial No. 629,998.

1,035,424—Pneumatic Wheel. Charles De Los Rice, Hartford, Conn. Filed November 29, 1908. Serial No. 464,855.

1,035,446—Spring Wheel. Jacob Kamppi, Elsie, Ore. Filed November 30, 1910. Serial No. 594,969.

1,035,454—Internal Combustion Power Apparatus. Isaac N. Lewis, U. S. Army. Filed March 29, 1909. Serial No. 486,615.

1,035,456—Tire Emplacing Tool. Thomas W. Lucke, Chicago, Ill. Filed September 6, 1910. Serial No. 580,594.

1,035,461—Motor Car. Alva Montel, Claypool, Ind. Filed March 21, 1912. Serial No. 685,342.

1,035,463—Ball Bearing. Edwin Oldfield, Norwich, Conn. Filed October 8, 1910. Serial No. 585,915.

1,035,473—Tire. Angelo C. Rovelli, Philadelphia, Pa., assignor of one-half to Max Strozzi, Philadelphia, Pa. Filed November 14, 1911. Serial No. 660,196.

1,035,474—Caloric Engine. John N. Ruffin, New York, N. Y. Filed December 4, 1911. Serial No. 663,950.

1,035,478—Fluid Clutch. Charles A. Sawtelle, Sacramento, Cal. Filed July 20, 1911. Serial No. 639,526.

1,035,487—Vehicle Tire. George E. Sarn, Camden, N. J., assignor, by mesne assignments, to Starn Tire Mfg. Co., Camden, N. J., a corporation of New Jersey. Filed April 23, 1910. Serial No. 557,229.

1,035,488—Gas Engine. Benjamin F. Stewart, Chicago, Ill. Original application filed September 11, 1907. Serial No. 393,340. Divided and this application filed July 11, 1910. Serial No. 571,526.

1,035,497—Motor Car Lamp Attachment. Arthur Gale Thompson, San Francisco, Cal. Filed December 8, 1908. Serial No. 466,447.

1,035,503—Gear Shifter. Albert C. Webb, St. Louis, Mo., assignor to the Webb Motor Fire Apparatus Co., St. Louis, Mo., a corporation of Delaware. Filed July 10, 1911. Serial No. 637,744.

1,035,504—Headlight. Charles I. Williams, Utica, N. Y. Filed April 1, 1911. Serial No. 618,475.

1,035,506—Revolving Track and Car Therefor. William H. Williams, Statesboro, Ga. Filed January 20, 1912. Serial No. 672,422.

1,035,513—Internal Combustion Engine. Gustav A. F. Ahlberg, Chicago, Ill. Filed November 28, 1910. Serial No. 594,520.

1,035,528—Upholstering Motor Cars and Other Vehicles. Max Alvinus Buch, Birmingham, England. Filed March 30, 1912. Serial No. 687,415.

1,035,556—Spring Wheel. George Doerffel, Oakland, Cal. Filed September 14, 1910. Serial No. 582,011.

1,035,586—Grip Thread for Elastic Tires. Carlton L. Hoff, York, Pa. Filed June 15, 1913. Serial No. 567,085.

1,035,600—Internal Combustion Engine. Charles C. Keyser, Pensacola, Fla. Filed December 22, 1911. Serial No. 667,310.

1,035,610—Motor Car Bumper. Friedrich Lederer, Milwaukee, Wis. Filed May 29, 1911. Serial No. 630,129.

1,035,614—Vaporizing Device for Explosive Engines. Abbot A. Low, Horsehoe, and Harry Hertzberg, New York, N. Y.; said Hertzberg assignor to said Low. Filed May 16, 1908. Serial No. 433,238.

1,035,625—Wheel. Joseph E. McWilliams, Hitchcock, Okla. Filed February 19, 1912. Serial No. 678,494.

1,035,651—Auxiliary Air Valve for Carbureters. Alfred C. Stewart, Los Angeles, Cal. Filed October 3, 1911. Serial No. 652,637.

1,035,653—Gasoline Filter. Frederick H. Stubbe, New York, N. Y., assignor of one-half to John C. Klatzl, New York, N. Y. Filed March 6, 1912. Serial No. 681,901.

1,035,654—Power Transmission Mechanism. Jacob Swanson, Davenport, Iowa. Filed January 16, 1912. Serial No. 671,520.

1,035,668—Headlight Turner. Ed Lee Wickett, Keithsburg, Ill. Filed January 2, 1912. Serial No. 668,854.

1,035,669—Friction Clutch. Louis W. Wiley, Waterloo, Iowa, assignor to Waterloo Gasoline Engine Co., Waterloo, Iowa. Filed October 2, 1911. Serial No. 652,318.

1,035,745—Alarm or Acoustic Apparatus. Ernest Rubes, Brooklyn, N. Y. Filed January 11, 1911. Serial No. 602,001.

1,035,746—Alarm or Acoustic Apparatus. Ernest Rubes, Brooklyn, N. Y. Filed January 11, 1911. Serial No. 602,002.

1,035,749—Apparatus for Making Tires. Joseph Norman Satterthwaite, Trenton, N. J., assignor to Empire Tire Co., Trenton, N. J., a corporation of New Jersey. Filed December 2, 1911. Serial No. 663,502.

FRENCH Piston-Valve Motor—No. 1,035,234—Emile Victor Reno and Joseph Alfred Chrysostome Bois, La Garenne-Columbres, France, assignors by mesne assignments to Sphynx Motor Co., New York City. Filed April 24, 1910, renewed October 16, 1911, dated August 13, 1912. Novel in the location, operation and manner of actuation of a piston valve, this invention consists of the application to an otherwise standard gas-engine design of a cylindrical valve chamber in the cylinder head, with ports in its lateral walls, having a piston valve within it, actuated by means of a cam, push-rod and rocker mechanism. This piston has a short vertical stroke and assumes progressively, positions wherein the upper port is opened, both ports are closed, and wherein the lower port is opened, as directed by the valve linkage. This is connected to the cam by a frame provided with opposed rollers, which bear on both sides of the cam, which is so cut and timed to the engine as to alternately raise and lower the aforementioned connections to it, in such a manner as to effect the necessary openings and closures for the engine cycle.

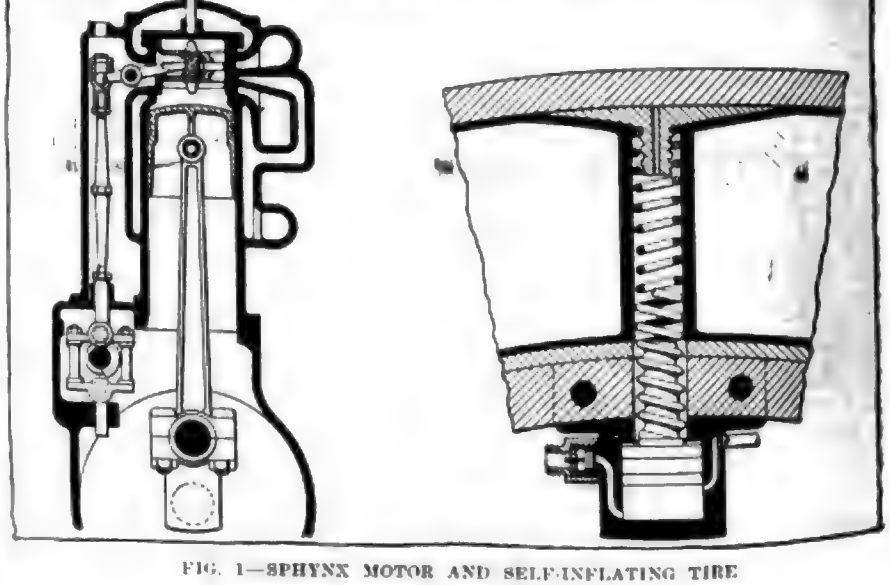


FIG. 1—SPHYNX MOTOR AND SELF-INFLATING TIRE

This arrangement permits the use of a cam or eccentric, without the use of springs. It permits the use of valves in the head, without employing poppet valves; and it permits a piston or sleeve port action without the use of a sleeve or sleeves, necessitating, therefore, but little departure from standard practice to adapt a design to the use of this type of valve.

Stewart Auxiliary Air Valve—No. 1,035,651, Alfred C. Stewart, Los Angeles, Calif. Filed October 3, 1911, dated August 13, 1912. To render additional flexibility to the carburetion of a gas-engine, this invention consists of a manually-controlled air inlet designed to be disposed between the carbureter and the intake manifold. The device consists of a short pipe, provided with flanges to adapt it to interposition between the manifold and carbureter, the diameter of its inner passage conforming with the diameter of the opening at the points of interposition. Entering this opening at a spiral, the auxiliary air passage opens at a tangent to this passage, terminating in a perforated tube, within which a piston valve reciprocates as controlled by a suitable connection to a manual control. This piston valve is normally closed, being held so by the suction of the engine, seating in a bevelled aperture, nearest the tangential opening to the gas passage, being drawn back and opening progressively the perforations of the tube in which it is disposed, as controlled by such a device as a bowden wire, as shown in Fig. 1. The spiral introduction thus, of fresh air into a carbureted gas has a tendency to form a more homogeneous mixture, than if the passage were direct, as the tendency of the latter method of introduction would be to striate the air within the gas, whereas the spiral admixture tends to distribute the air in the form of a thin sheet about the gas column, homogenizing readily.

Self-Inflating, Non-Collapsible Tire—No. 1,035,283—Frank F. Wear, San Francisco, Calif., assignor to himself as trustee. Filed November 23, 1910, dated August 13, 1912. Designed to prevent rim-cutting and under-inflation, this patent relates to a tire composed of sectional inner tubes, inclosed within a casing, similar to the ordinary pneumatic tire casing, with spring plunger pumps disposed between the tube sections. These pumps are mounted on the felloe of the wheel, and consist of an external cylinder, within which a small piston reciprocates as controlled by a spring plunger, extending into the tire, and bearing on its lateral interior surface. This plunger is placed between two pneumatic sections, and is so acted upon by a helical spring as to induce reciprocal movement on the part of the pump piston, in response to the displacement of the tire as it passes over inequalities in the road. Air is admitted to the pump cylinder through a check-valve, and is discharged on the instroke through a small passage to the tube. The action, therefore is to further inflate the tube on each compression of the tire, the greater pressure induced by such inflation rendering the tire less responsive to the effect of inequalities, and the action of the pump being thus restricted. Absolute deflation is prevented by the expansion of the tire by the springs. It is presumed that some means would be employed, in actual construction, to prevent over-inflation.

Punctureless Pneumatic Tire—No. 1,035,487—George E. Starn, Camden, N. J., assignor, by mesne assignments, to Starn Tire and Mfg. Co., Camden, N. J. Filed April 23, 1910, dated August 13, 1912. Comprising a heavy single tube pneumatic envelope, disposed on three sides within a channelled steel rim, which extends outward sufficiently to enclose the greater portion of the sides of a solid rubber thread, this construction is designed to possess more resiliency than a solid tire, yet retain its freedom from the troubles attendant upon most tires of pneumatic character. The rim is composed of a felloe band, which forms the base of the rim, an inside side plate, riveted to the former, and an outside plate of substantially the same size as the inside one, but bolted to the felloe band, to permit its removal and the detaching of the tire members. The latter portions of the assembly consist of an inflatable tube, moulded to conform to the shape of the rim, and of radial form on its outer face, and a solid tread member of sufficient thickness to prevent puncture of the inner tube, whose inner surface conforms to the radial form of the outer face of the tube, and whose outer surface is of the same radial character, forming a rounded tread surface.

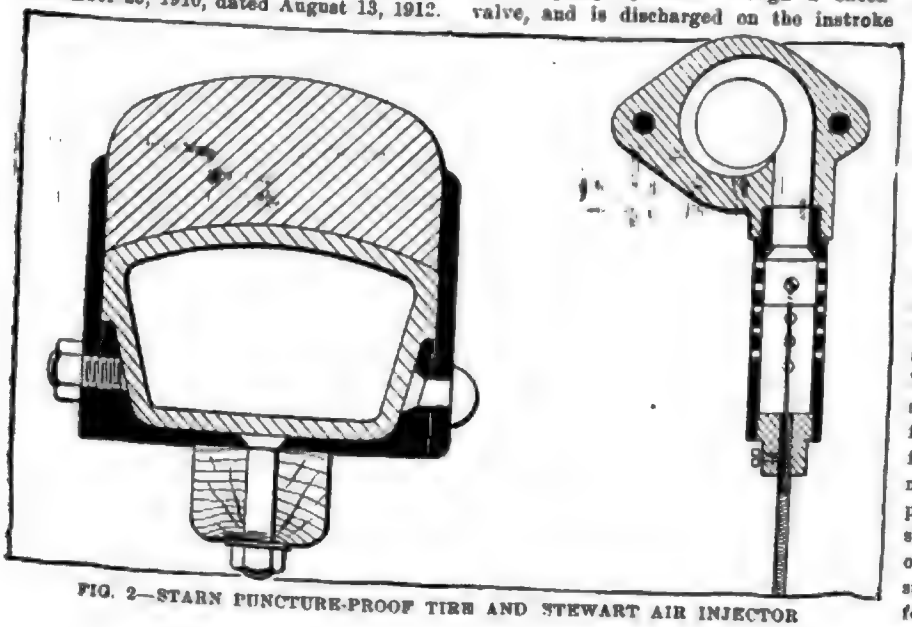


FIG. 2—STARN PUNCTURE-PROOF TIRE AND STEWART AIR INJECTOR

The Motorists' Bookmark

Panama—Past and Present

AMONG the books of intense interest at the present time is "Panama," by Albert Edwards. In charming style the reader is introduced to the semi-tropics on a trip across the Gulf of Mexico, touching at Barbados, a care-free isle, then drawn into strenuous conditions attendant upon securing laborers for the Herculean undertaking of uniting the oceans.

Many chapters are rich with the early history and romance of the isthmus, for Panama has been a vantage point through centuries, a point of centralization, a point of radiation, but soon to enter on a new chapter as a universal benefit to mankind and retrieve its past history of iniquity. Though Mr. Edwards seems inclined toward the just construction of intent and act, he could not make this narrow strand of earth other than a trail of hope, alternating with hatred, blood, intrigue and splendor. With closest interest one traces its fortunes from the days of Columbus, when adventure became history, through the days of rapacious greed for the Incas' treasure, days of the dauntless conquistadors, with now and then a cassocked priest taking prominent place as a sovereign's envoy or humane intercepter for the helpless, enslaved and slaughtered Indians; days of bucaneering on the Spanish main, the palmy days of Porto Bello and the great trade, the wars for independence, and the dawning of the project of uniting the oceans, first by railroad and then by waterway, to these days of the wonders of Culebra cut and the Gatun locks, magnificent achievements of engineering skill, and the diplomatic handling of human forces. The chapters of history prepare the reader for a fuller understanding of this great undertaking. The Macmillan Co., New York. Price, $1.50 net.

Among the Makers and Dealers

TESTING REAR AXLE FOR NOISY GEARS AND BRAKE EFFICIENCY IN WESTON-MOTT FACTORY AT FLINT, MICH.

FITZSIMONS Leaving Thomas—George Fitzsimons has resigned his position as sales manager of the E. R. Thomas Motor Car Co., of Buffalo, to take effect September 1.

Webb Jay Changes—Webb Jay, formerly manager of the Chicago Rambler branch, has made a change, having been appointed assistant general manager of the Haynes Automobile Co., with headquarters at Kokomo, Ind.

Groves Speedwell Sales Manager—Frank A. Groves, widely known in the motor car world, has been appointed sales manager of the Speedwell Motor Car Co., of Dayton, O. For the last 5 years Mr. Groves has been Chicago agent for the Speedwell.

To Make Clutches—A clutch operated on a hydraulic principle, for motor cars, will be manufactured by the Hydraulic Transmission Co., which has just been organized in Indianapolis by W. K. Millholland, Paul Millholland and Ernest Millholland, who conduct the W. K. Millholland Machine Co. The Millholland company is a contractor and manufacturer of motor car parts and will be closely allied with the new concern, which is incorporated with an authorized capitalization of $200,000.

Buick Starts 1913 Shipments—The Buick Motor Co. has made its first shipment of assembled cars of the 1913 model from Flint, Mich. A carload went to San Francisco, the first city to receive next year's line of cars. Shipments will be made from day to day to the agencies farthest from Flint in order that the distant points may be served at the same time as the closer ones. At present 3,000 men are on the payroll, the production is 90 days ahead of last year and the shipments are 60 days ahead of time, it is claimed. The Buick company sold approximately 20,000 cars of the 1912 model. The program calls for from 25,000 to 30,000 cars of the 1913 model.

Attica Plant Disposed Of—The motor car plant at Attica, O., which proved a losing venture and has been closed for some time, probably will never be reopened. This was made evident when a deed was filed with the county recorder at Tiffin, O., whereby the Cameron Car Co., of Beverly, Mass., sold its real estate in the village of Attica to the Beverly National Bank.

Swinehart Declares a Dividend—The Swinehart Rubber Co., of Akron, Ohio, has declared a quarterly dividend of 1½ per cent which means the reduction of the regular dividend from 8 to 6 per cent. In a letter sent out with the dividend checks the statement was made that the company deemed it advisable to reduce the dividend and build up a larger working capital.

Jones Trebling Capacity—The Jones speedometer makers are trebling their manufacturing facilities by fully equipping with special improved machinery at Bush Terminal, Brooklyn, an additional factory much larger than its plant at New Rochelle. The New Rochelle factory will be continued at its full capacity, but the general offices and shipping department will, on October 1 next, be removed to Bush Terminal, where with ideal shipping facilities—loading directly to through freight cars at the factory door—4 to 8 days' freight will be saved on shipments to all western points. On the same date the commercial vehicle instrument shipping department now at the Canal place, New York city factory—where the recorders, hub odometers and truck speedometers are made—will be moved to and consolidated with the speedometer service station in the Speedometer building, Broadway and Seventy-sixth street, New York city.

New Stearns Sales Manager—R. H. Williams has been appointed sales manager of the F. B. Stearns Co., Cleveland. Mr. Williams' first connection with the company was that of traveling representative. He then opened up the Pittsburgh and Atlanta fields, establishing branches in both cities. He was then made general traveling representative, his territory covering the entire United States.

Marvel Moving to Michigan—Arrangements are being completed to move the plant of the Marvel Carbureter Co. from Indianapolis to Flint, Mich. A. G. Schonacker, general manager of the company, has just returned from a trip to Michigan, where he consummated a deal for the removal of the plant. The stock has been sold to a number of motor cars manufacturers by the Indianapolis stockholders. Mr. Schonacker will remain with the company as manager in its new location.

Bosch Not to Move—Chief Engineer Elbert Klein of the Bosch Magneto Co.'s plant at Springfield, Mass., has told the committee of 100 of that city that the Bosch company will not move to another location, at least for the present, but that until it is definitely settled whether or not the meat rendering companies located near the Bosch plant, and against which many complaints have been made, are to move the Bosch company will not make any plans to extend its factory buildings. The company is building a restaurant for its employes now, and if the rendering companies were ousted it is probable that the magneto company would build additional extensions to its big plant.

Solving Building Problem—The Willys-Overland Co., which is engaged in doubling the capacity of its plant in Toledo, has employed a unique method of construction in the erection of the new transformer station in the center of the big factory buildings, which has created considerable interest among contractors. After signing the contracts President J. N. Willys awoke to the fact that carrying the material for the new structures through the main gates would block the factory system and more or less cripple the production of Overland cars, as well as interfere with the testers and hold up the installation of new machinery, parts and materials. Then it was decided to have all cement, glass, dynamos and other materials carried over the tops of the three-story factory buildings. Derricks were raised and spouts constructed for the work. All cement is being mixed

outside the main plant, hoisted above the outside factories and poured through the spouts to the site of the new building. Thus the work on the new building is progressing with all possible speed.

Overland's 1913 Order—Thirty-six thousand five hundred and eighty Overland cars were contracted for by dealers throughout the country before the 1913 announcement was made, says the Willys-Overland Co., which states that San Francisco has contracted for 3,000 cars, New England, New York city, Minneapolis, Kansas City and Philadelphia, 1,500 each, while Iowa will consume 2,500 Overlands. Every state in the union is taking from 25 to 100 per cent more Overlands than last year. Especially is the demand heavy in the middle and extreme western states. The farming sections will show the biggest increase.

Atlas Plant Closed Temporarily—The Atlas Motor Car Co. of Springfield, Mass., has practically closed its plant temporarily because of its inability to secure motors for its product. Plans are under way for a directors' meeting at which the capital stock will be increased from $250,000 to $350,000 and an arrangement made to build the motors at the plant. The question of a reorganization also will be discussed. The company has orders approximating $200,000 on its books and these would be largely increased if the company had not been handicapped just at this time in getting motors.

A New Chalmers Building—An accompanying photograph shows the site of the new Chalmers building in Detroit which will be a four-story reinforced structure. This building, which will take care of the inspection department and part of the final assembly, was commenced on August 1. It is expected that the building will be ready for occupancy by November 15. This addition is part of the plan for increasing the manufacturing facilities of the Chalmers plant. The present structure will have 55,000 feet of floor space. It will be 191 feet by 71 feet, connecting two of the main buildings and forming with them an H-shaped structure. The most improved style of power construction is being used. Plans call for all steel and concrete construction of the flush-ceiling type, that is, there will be no beams or girders shown anywhere in the interior, leaving the entire space available for machinery. There will be inserts for counter-shafts and the installation of any type of special design machinery. The plumbing and lighting facilities will be the most improved known to modern construction. An arched driveway will leave open the rectangular street entrance to the testing yard and the new structure will make possible a floor to floor tramway between two of the large manufacturing plants. The big increase in the Chalmers business in the last year has brought about a congestion in the factory, even though the present plant has a manufacturing floor space of 1,000,000 square feet. Two large tents were set up a few days ago to take care of the congestion in the final assembly department. Fully equipped, the cost of the building will be $150,000 to $200,000.

Chevrolet Buys a Plant—Official announcement is made that the Chevrolet Motor Co. has purchased the plant of the Imperial Wheel Works and will open a factory in Flint about September 1. The Chevrolet company is one of the organizations owned by the Republic Motor Co., recently capitalized in Delaware for $65,000,000.

Rim Company Elects Officers—The Detroit Demountable Rim Co. held its annual meeting last week and elected A. H. Goss treasurer and general manager, to succeed Harry M. Snyder, who retires to go with the Reo company at Lansing. Chester C. Harbridge, who has been vice-president since the organization of the company, was elected president.

Atwater Kent Moves—The Atwater Kent Mfg. Works has removed to its new factory building in Philadelphia. The new building is a one-story structure containing 21,000 square feet, especially designed for the work of this concern. It is situated on the line of the Philadelphia and Reading Railway, Germantown and Chestnut Hill division, at the corner of East Logan street and Stenton avenue, near Wayne Junction.

More Buildings for Goodrich—Building Inspector Goodwin of Akron, Ohio, has approved plans prepared by the B. F. Goodrich Co., for the erection of a large addition to the office building. It is the plan of the officials of the company to combine the office forces of the Goodrich and the Diamond companies and as a result a larger office building will be necessary. The estimated cost of the addition will be $100,000. When completed the structure will be 228 feet long and five stories high instead of four stories. The lower floors of the addition will be used for the general offices while the fifth floor will be reserved for the offices of the officials of the corporation. The work of construction will be started at once.

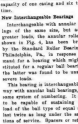
Will Retire Preferred Stock—The stockholders of the Goodyear Tire and Rubber Co., of Akron, Ohio, will meet September 9 for the purpose of voting on the proposition of changing the constitution and by-laws in order to retire the preferred stock after 1915.

Morgan Company Reorganized—The Morgan Motor Truck Co., of Worcester, Mass., has been reorganized with Charles B. Foster, president; Evan F. Jones, treasurer; Charles H. Derby, clerk; Jerome R. George, John E. Bradley, Charles B. Foster and Lancaster P. Clark, directors. The capital stock has been reduced from $1,100,000 to $300,000.

Building New Tire Plant—The plant of the Toronto Rubber Co., of Toronto, Ohio, will be completed about September 15, when it will be placed in operation. All of the repair work and improvements on the plant which was formerly occupied by the American China Co., will be completed by that time and the machinery installed. It is the intention to employ about seventy-five men at the start. The company will manufacture all kinds of rubber articles, including tires and other motor car accessories.

Franklin's Increased Business—Figures just completed by the Franklin Automobile Co. show that the average increase in Franklin business all over the country is 20 per cent over the mean proportional between the business of 1910 and 1911. These figures are particularly interesting when it is known that they cover only the first 6 months of this year, whereas the figures used as a basis for comparison covered the entire selling years of 1910 and 1911. The increase is all the more marked because it is made in the sales period which is usually termed dull.


START OF ADDITION TO CHALMERS FACTORY AT DETROIT



Development Briefs

New Garage Vulcanizing Plant Uses Thermostat—Red Head Platinum Point Plugs—Extra Large Spark Plug for Trucks—Mazda Motor Lamps—Mello-Tone Exhaust Signal

FIG. 1—SHALER GARAGE PLANT

New Garage Vulcanizer

SIMILAR to the familiar Shaler portable vulcanizers, a new **garage plant** has been brought out by the C. A. Shaler Co., of Waupun, Wis. This vulcanizer shown in Fig. 1, like all of this make is of the steam type. The boiler which appears at the left of the picture, is virtually of the water tube type, and is fitted with a steam gauge and safety valve. In addition to these features, however, it is equipped with the new thermostatic controller, described in these columns on Aug. 1st. This device, which consists of two springs of dissimilar expansive qualities, connected at their point of greatest flexure to a damper, is of especial value in a garage plant, as it permits the busy garage man to divert his valuable attention without fear of either undercureing or burning the job. A gasoline burner is used, which it is said will burn all day at a cost of but 1 cent per hour. Twenty minutes, it is asserted, is all that is required to generate full steam with this combination. It has a capacity of one casing and six tubes at a time.

FIG. 2—RED HEAD MAGNETO PLUG

New Interchangeable Bearings

Interchangeable with annular ball bearings of the same size, but adapted to greater loads, the annular roller bearing shown in Fig. 4, has been brought out by the Standard Roller Bearing Co., of Philadelphia, Pa., in response to a demand for a bearing which might be substituted for a regular ball bearing, where the latter was found to be unadapted to severe loads.

This bearing is interchangeable in every way with annular ball bearings, using the same system of numbering. It is claimed to be capable of sustaining twice the load of the ball type of equal size, or to last twice as long under the same conditions of service. Spacers or retainers are used, and annular projections on the races engaging grooves in the rollers, prevent side movement. The rollers are true cylinders instead of the usual tapered type, and run in a true axial plane with the mounting. It is especially designed by the manufacturers for use on crankshafts, where severe loads are constant. These bearings are not thrust bearings, and where severe end-thrust is to be encountered, should be used in conjunction with ball thrust bearings, in the manner usual with ball bearings.

Rajah Giant Plug

Embodying the general structural features that characterize former Rajah plugs, the latest product of the Rajah Auto Supply Co., of Bloomfield, N. J., shown in Fig. 3, differs from other models in the size of its porcelains. These porcelains have been made unusually large to adapt them to use on motor tractors and trucks, and in motor car and motor boat racing, where the conditions of use are more severe than most plugs are designed to stand. The porcelains are made in Europe, where it is claimed that better manufacturing facilities are available than in this country. The metal parts are machined to S. A. E. standards of both size and accuracy, and are made extra heavy to correspond with the insulators. The electrodes also are made heavy and of a special alloy of imported metal to withstand the strongest magneto spark.

The characteristic features that have been embodied in this line for 8 years are retained. Among these are extreme simplicity and ease of disassembly for cleaning and repair. The plug consists of but four parts, viz., the porcelain, the shell, the brass bushing and the inside copper asbestos gasket. In the design of the shell special attention has been given to the prevention of short circuits due to excessive oil, and complete protection of the porcelains. The knife-edge bushing renders but one gasket necessary; and the button-top feature, in connection with the Rajah terminal, which is furnished with every plug, dispenses with the usual thumb-screw binding post. All parts with the exception of porcelains and electrodes, which are imported, are made in one factory.

FIG. 3—RAJAH GIANT HEAVY-DUTY PLUG

Mello-tone Exhaust Horn

Featuring an adjustable clamp, which enables it to be attached to any size of exhaust pipe, and an adjustable tone, which permits a wide range of tone variance, applied to an exhaust of any pressure, the Mello-tone exhaust signal is manufactured by the Electric City Mfg. Co., of Buffalo, N. Y. It operates by means of a foot-pedal operated cutout valve, which when closed over the end of the exhaust pipe to which the horn is attached, deflects the gases through a cylindrical tube, closed at one end, producing a mellow tone that is clear and distinct, but not unmelodious. The cutout mechanism is noteworthy in that it oper-

Novelties for Motoring

Roller Bearings Interchangeable with Ball Type—Small Electric Pump for Garages—Self-Cleaning Exhaust Chime—Late Devices of Interest to the Motorist and Repairman

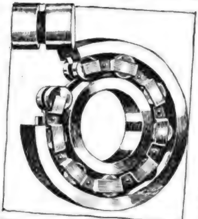


FIG. 4—STANDARD INTERCHANGEABLE BEARING

ates on a somewhat different principle from that used by most signals of this character; the whole signal being pivoted at one side to the clamp, being held away from the opening by a spring when not in use, and being drawn across it by the pedal connections, to deflect the gases into the sounding bell. This is said to obviate both back pressure and the purring sound so often associated with such signals of this kind when not in use. The horn is shown in Fig. 5.

Motor Car Mazda Lamps

Electric light is coming into such popularity, that the General Electric Co., Harrison, N. J., has brought out a special lamp for use in electric head-lights. This lamp is of the mazda type, but specially adapted to the stringent vibratory conditions of motor car service. This improvement is, as is to be expected, the idea of Edison, and consists of a drawn wire filament, which retains its lighting efficiency of 2½ times as great as the carbon, but owing to its manufacture possesses about twice the strength of the ordinary tungsten. It is made in sizes of from 9 to 24 candlepower.

Prevent Spring Rattling

Manager H. G. Trench of the repair department of the Norcross-Cameron Co garage at Springfield, Mass, has just received patent papers on a spring shackle device designed to prevent the rattling of springs after they begin to wear.

When a car is used for some time the plates begin to wear against the sides of the spring and as there is no way to compensate for this the plates rattle. Mr. Trench's device does away with this because one of the plates has recessed in its springs pressing against the nut which acts as a nut lock and takes up the wear. The result is that the plates are held as firmly as when first put on new and rattling is eliminated. It can be used on semi-eliptic and three-quarter eliptic springs.

Electric Garage Tire Pump

Peculiarly suited to the requirements of a small private garage is the electric tire pump illustrated in Fig. 6. This pump is extremely simple, and uses the ordinary lighting current. It is mounted on two small wheels and consists of a single-cylinder, air-cooled vertical compressor, with a closed base, geared direct to the motor. The compressor has but one valve and is lubricated by means of a grease cup in the side of the cylinder and on the crankshaft bearings. The truck is fitted with a rigid tongue which has convenient hooks to support the tube. The outfit includes a switch, 20 feet of lamp cord, with plug, and 6 feet of ½-inch hose, provided with a tire valve connection and pressure gauge. It is built by the Ingersoll-Rand Co., of New York.

Red Head Platinum Point

Super high-tension magnetoes, as employed in the ignition of many of the high-grade high-powered cars for 1913, has made new demands on the manufacturer of spark plugs. So hot is the spark generated in many of these systems that any metal but the best platinum is soon fused by the terrific discharge on the delicate sparking point.

The Emil Grossman Co., of New York, in response to the new demand, has brought out the latest of its family of Red Head spark plugs, the Red Head platinum point plug, shown in Fig. 2. It differs in general design and appearance very slightly from the previous models, the chief difference being in the composition of the sparking points, which are of a high-grade platinum, 1/32 inch thick. A new binding post design also has been incorporated in this plug, which is a combination of the screw top and snap-on types of terminals. It will accommodate snap, ring, or slip cable connectors of all types.

To give individuality to the new product, and avoid confusion with its fellows, the magneto plug has been plated with a heavy double-dipped nickel shell, cap and bushing, to harmonize with the popular nickel trim of high-powered motors. A unique and practical container of bullet shape has been provided for this plug, into which it screws, to protect the points.

FIG. 5—MELLO-TONE SIGNAL

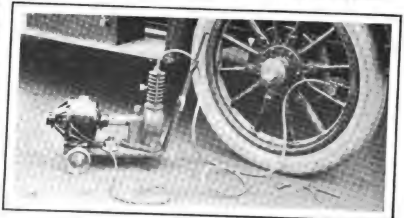


FIG. 6—INGERSOLL-RAND CO.'S ELECTRIC TIRE PUMP

Brief Business Announcements

Recent Agencies Appointed by Car and Truck Manufacturers

PLEASURE CARS

Town—	Agent	Make
Battle Cr'k, Mich.	American Motor Co.	Franklin
Boston, Mass.	Dayton G. True	Krit
Boston, Mass.	Frederick A. Dutton	Abbott-Detroit
Boston, Mass.	Glossbrenner Commercial Car Co.	Stutz
Boston, Mass.	Dunham Auto Co.	Standard
Boswell, Ind.	Levi J. Orr	R. C. H.
Buffalo, N. Y.	E. E. Grimmel	Ideal
Buffalo, N. Y.	Louis G. Schoepflin Co.	Hupp-Yeats
Chicago	J. G. Tennant & Co.	Henderson
Casper, Wyo.	Casper Machine and Garage Co.	Cole
Cheyenne, Wyo.	Boyle and Joffee	Cole
Charleston, S. C.	King Auto and Repair Co.	Cole
Canton, Ill.	Meade McClathey	Henderson
Dallas, Tex.	R. H. Davis and L. P. Turney	R. C. H.
Davenport, Ia.	Knueppel and Ott	R. C. H.
Decatur, Ill.	F. D. Parker	Henderson
Elizabethtown, N.Y.	V. W. Prime	R. C. H.
Elizabeth, N. J.	Franklin Auto Co.	R. C. H.
Enderlin, N. D.	B. N. Engle	R. C. H.
Edison, Ga.	C. C. Weaver	Oakland
Edmonton, Alberta, Canada	Standard Motor Car Co., Ltd.	Henderson
Galveston, Tex.	John Christenson & Co.	Cole
Granville, N. Y.	G. C. Walker	R. C. H.
Harvard, Ill.	W. F. Wittmus	R. C. H.
Haverhill, Mass.	Samuel E. Cass	R. C. H.
Independence, Kans.	J. A. Pinkston	R. C. H.
Indianapolis, Ind.	Finch and Freeman	Nyberg
Leads, S. D.	Blodgett Brothers	Cole
Lander, Wyo.	Cole and Co.	Cole
Lowell, Mass.	City Hall Garage	R. C. H.
Madison, Wis.	Schoellkopf Co.	Ford
Milwaukee, Wis.	W. E. Allen Co.	McFarlan
Milwaukee, Wis.	W. E. Allen Co.	Marion
Madison, Wis.	Spooner-McConnell Auto Co.	Oakland
Madison, Wis.	Spooner-McConnell Auto Co.	Kisselkar
Milwaukee, Wis.	Wagner & Johnson	Regal
Madison, Wis.	W. H. Hobbs Supply Co.	Chalmers
Madison, Wis.	Spooner-McConnell Auto Co.	R. C. H.
Norton, Mass.	A. W. Sibley	R. C. H.
New Brunswick, N. J.	New Brunswick Garage Co.	R. C. H.
Oconto Falls, Wis.	Munsert-Carlson Auto Co.	Ford
Plattsburg, N. Y.	R. W. Squires	R. C. H.
Portland, Ore.	H. L. Keats	Rauch & Lang
Paterson, N. J.	F. P. Venable	R. C. H.
Rochester, N. Y.	E. W. Fisher	Mitchell
Rochester, N. Y.	John Grape	Dart
Ridgeville, Ind.	J. Carpenter	R. C. H.
Red Lodge, Mont.	J. P. Punkett	R. C. H.
Rutland, Vt.	Rutland Garage Co.	Cole
Springfield, Mass.	F. W. Davis & Sons	Henderson
South Ben, Ind.	Johnson Beattie Auto Co.	R. C. H.
Sullivan, Ind.	E. S. Crowder	R. C. H.
Somerville, N. J.	Thomas Motor Car Co.	R. C. H.
Springfield, Ill.	R. Haas Electric and Mfg. Co.	R. C. H.
Sheboygan, Wis.	Sheboygan Automobile and Supply Co.	Studebaker
St. Louis, Mo.	George C. Brinkman	Nyberg
Thomasville, Ga.	Thomasville Motor Co.	Oakland
Twin Falls, Id.	Swim & Aldrich	Franklin
Worcester, Mass.	Caton-Brewster Co.	Pope-Hartford
Zion City, Ill.	Duncan G. Bellows	R. C. H.

TRUCKS

Boston, Mass.	R. H. and R. L. Smith Co.	Brown
Cleveland, O.	Eckenroth Sales Co.	Federal
Dallas, Tex.	Fife and Miller	Lincoln
Indianapolis, Ind.	Finch and Freeman	Nyberg
Melbourne, Australia	American Truck and Auto Co.	Federal
New York	Rockwell Motor Transportation Co.	Lincoln
Sioux City, Ia.	Interstate Auto and Supply Co.	Federal
St. Louis, Mo.	George C. Brinkman	Nyberg
Tecumseh, Mich.	L. C. Hayden	Federal
Washington, D. C.	Motor Truck Co.	Atterbury
Washington, D. C.	Motor Truck Co.	Hatfield

La Crosse, Wis.—The Zimmer garage was damaged $10,000 by fire on August 16.

Boston, Mass.—Lester E. Grant, formerly a member of the Hollander Motor Car Co., agent for the Metz in Boston, has resigned to go with the Williams Brothers Co., agent for the Cartercar.

Baltimore, Md.—Callahan Brothers & Co., representatives for the Morgan truck and De Tamble car, have moved from their old quarters at 328 North Charles street to their new garage and salesrooms at 1112 Morton street.

Boston, Mass.—The Selbach Rubber Co., a Massachusetts corporation doing business at 404 Columbus avenue, has assigned. The assignment was made to Walter Powers, but no estimate has been made of the value of the business or the amount of the indebtedness.

Toledo, O.—C. R. Bowersox, manager of the Bowersox Motor Sales Co., has closed a contract with the Regal Motor Car Co., of Detroit, which gives this concern the exclusive sale of Regal cars in northwestern Ohio. The retail sales in Toledo will be handled direct from the local salesrooms, while the northwestern territory except Bryan, O., where the Bowersox company has a branch, will be handled through sub-agents. The company has been selling agent for the Everitt cars in most of the smaller cities and towns and most of the dealers will now handle both lines.

Richmond, Va.—The Chesterfield Automobile Co. has moved into a new garage on West Broad street.

St. Paul, Minn.—The Studebaker Corporation is making over an old church at Franklin and Sixth streets for its St. Paul agency. The changes will be completed in 60 days.

Columbus, O.—The Auto Exchange, 539 North Park street is the name of a new concern opened by R. C. Shisler, formerly connected with the Ohio Auto Sales Co., of Columbus. The concern deals in second-hand cars only.

Portland, Ore.—J. E. C. Mazon, formerly president and general manager of the Portland-Detroit Auto Co., has disposed of his interest in the firm and in future will be connected with the selling end of the Nob Hill and Garage Co., Portland agents for the American.

Indianapolis, Md.—On a petition filed by the O'Bannon Corporation of New York, George L. Paetz, also a creditor, has been appointed receiver for the Indianapolis Auto Top and Rubber Tire Co. by the superior court in Indianapolis. The petition was based on an account amounting to $183.83. It is charged the concern is in imminent danger of insolvency and has debts aggregating $5,000. The company manufactures motor car tops and does general tire repairing.

Richmond, Va.—Plans are being prepared for a garage for the Ford Automobile Co., West Broad street, to cost $25,000.

Boston, Mass.—M. R. Paige, formerly sales manager of the Moline Wagon Co., Moline, Ill., has gone to Boston to join the Boston branch of the Velie, taking charge of the commercial department.

Toledo, O.—The Dennis Motor Co., recently organized in this city, has opened an establishment corner of Madison avenue and Fifteenth street. The company handles the Rambler, Alco, Cino, Lozier and Detroit electric cars.

Buffalo, N. Y.—At a reorganization of the Positive Clutch and Pulley Co., manufacturer of patented power transmission appliances, Ulysses L. Caudell was elected president; Thomas A. Chrisholm, vice-president, and Geoffrey T. Clarkson, secretary-treasurer.

Toledo, O.—The Jamieson Brothers Motor Co., now owner of the three-story building and ground at 137-9 Huron street, purchased for $31,500, will erect new buildings on the site, which will be used as an annex to its present large garage and sales rooms. The new building will be of pressed brick and will cost about $20,000. Work on the new structure to be used as part

of the First Garage and Motor Co., will be started directly on the expiration of the lease held by the Toledo Chandelier Co.

Portland, Ore.—The Alco Motor Car Co. has taken the second story of the Paquet garage in Portland on East Eighth street.

Toledo, O.—William H. Moore has accepted a position as sales manager with the new Gramm-Bernstein Co., of Lima, O. Mr. Moore formerly was connected with the Gramm Motor Truck Co.

Madison, Wis.—The Ritter Automobile Co. has broken ground for a new garage building of reinforced concrete construction, two stories and basement high, 66 by 76 feet in size, at Johnson, Henry and State street triangle.

Wilmington, Del.—The Gomery-Schwartz Co., local agent for the Hudson, has taken the large garage and sales rooms at 1011 Orange street, erected about a year ago by the Stoddard-Dayton company, the latter having taken a new garage at Eleventh and West streets.

St. Paul, Minn.—The Northwest Kissel Kar Co. will open its St. Paul service garage September 15, 237 West Ninth street, St. Paul, with 30,000 square feet of floor space. It will be three stories with an 8-ton elevator. The cost will be $60,000.

Detroit, Mich.—The Ignition Starter Co. has opened a branch in Indianapolis with H. L. Morgan in charge as manager. The company has closed a deal for a plant in this city which will give it a floor space of 100,000 square feet for the manufacture of its new electric starting device.

Boston, Mass.—Frank H. Coyne, doing business in Boston and New York under the name of the Detroit Tool Sales Co. and the Portable Machine Shop Co., an accessory concern, made an assignment last week. He owes $95,405, of which $95,201 is unsecured among about 200 creditors. The creditors are scattered throughout the country.

Baltimore, Md.—A receiver has been appointed for the Madison Motor Car Co. of this city by Judge Dawkins in the circuit court. The bill of complain was filed by Pinckney L. Sothoron who states that he is a stockholder of the company, having twenty-five shares at $100 a share. The company consented to having J. Milton Lyell appointed receiver and permission was granted to the receiver to continue the business for 60 days.

Madison, Wis.—The Power-Stevens Fan Devices Co. has been organized at Madison, Wis., with a capital stock of $150,000 to manufacture devices invented by J. J. Power of Madison. The principal invention is a fan or blower adapted especially for motor car cooling use, although it has been adapted for vacuum cleaners, ventilating devices, sanitary systems and other purposes. The company has elected these officers. President, Joseph C. Schubert; vice-president, J. J. Power; secretary, John E. McWilliams; treasurer, Leroy W. Stevens, Chicago. Plans for manufacturing are now being completed.

Utica, N. Y.—The Iroquois Auto Top Co. has removed its factory from the Whiffen block to the Cox building, Columbia street.

Seattle, Wash.—The Detroiter car has arrived in Seattle and the agency has been taken by the Olympic Motor Car Co., while the Union Motor Car Co. will act as distributor for the new car in Tacoma.

Moline, Ill.—C. E. Giltner, formerly with the Rambler, of Omaha, has accepted a position with the Velie Motor Vehicle Co. Mr. Giltner formerly was manager of the Racine-Sattley Mfg. Co. and also at one time with the Moline Plow Co.

Oconto Falls, Wis.—The Munsert-Carlson Auto Co. has been organized at Oconto Falls, by W. J. Munsert and C. W. Carlson and incorporated for $5,000 to conduct a garage and deal in motor cars. The concern will handle the Ford in this territory.

Baltimore, Md.—The Locomobile Co. of America is now in its new location at 109 to 121 West Mount Royal avenue, formerly the headquarters of the Stoddard-Dayton Auto Co. T. W. Wilson is manager of the local branch of the Locomobile company.

Buffalo, N. Y.—Frederick R. Thompson and George A. Brockway, both of Homer, N. Y., have leased the plant of the Ellis Omnibus and Cab Co., Cortland, N. Y., for their factory, in which to manufacture motor trucks. The plant was leased with an option for purchase if later desired.

Boston, Mass.—Joseph D. Warren, formerly with the Metzger Motor Car Co., has become New England manager of the Abbott-Detroit, and he is negotiating now with some Bostonians to take over the Boston agency that has been at a standstill since the death of Willard M. Jenkins, a few months ago.

Seattle, Wash.—After having been without representation in Seattle for the past year, the Franklin has again appeared in the Queen City under the management of W. A. Wicks, who has opened salesrooms at 1109-11 East Union street. Mr. Wicks is from the engineering department of the H. H. Franklin Co. and has taken the distributing agency for the states of Washington and Oregon and the province of British Columbia.

Baltimore, Md.—The White company is now represented in Baltimore by a direct branch. This change took place August 1, and was the outcome of the White Automobile Co., Mount Royal and Guilford avenues, formerly the agent for the White company, being merged into the White Motor Car Co. Charles E. Tracy has been brought direct from the White factory to take charge of the branch. Jay S. Strouse will continue as head of the sales department of the company and Frank J. Hupka will be superintendent of the mechanical branch.

Hartford, Wis.—The garage firm of Walters & Wittig, of Hartford, Wis., has been dissolved, Charles F. Wittig continuing the business.

Columbus, O.—Richard Westwater will act as distributor for the Inter-State in central Ohio. B. R. Currier, formerly connected with the factory at Muncie will act as city sales manager for the Inter-State.

Buffalo, N. Y.—Arthur J. Stuart, formerly connected with the Kisselkar company, has been appointed sales manager of the Mason B. Hatch Co., Main and Northampton streets, which concern handles Chalmers and Stearns cars.

Boston, Mass.—Roberts & Sherburne, who have taken on the American for Boston, have placed G. W. Hamilton in charge as manager of the agency. George Brown, who went to Boston from the American factory at Indianapolis, is manager of the service department.

Buffalo, N. Y.—The Studebaker Sales Co. has been incorporated with capital of $25,000, directors being Arthur W. Haile, Bradley N. Phillips, and E. C. Schlenker, all of Buffalo, N. Y. The new concern will deal in motor cars and accessories. Commercial vehicles may be added later.

Cincinnati, O.—The Victor Auto Parts Co. is a new concern that will enter into business here. Articles of incorporation have been filed capitalizing the new company at $20,000. William J. Corcoran, Edward W. Corcoran, Harvey B. Corcoran and H. R. Kearns are the founders of the new concern.

Columbus, O.—The Capitol Garage and Storage Co., which is a partnership composed of H. A. Soll and J. R. Glancy, has opened a large garage and repair shop at the southwest corner of Third and Rich streets. The building contains 10,000 square feet of storage space. The company has taken the agency for the Rambler in Franklin county.

Columbus, O.—The Franklin Automobile Garage is the name of a new concern of which B. H. Lawwell is manager, which has taken over the garage at 846 West Broad street formerly conducted by Morgan and Kaiser. The garage is fully equipped with a repair shop and vulcanizer and is housed in a new structure 50 by 75 feet. For the time being at least no line of cars is handled.

Portland, Ore.—Three Portland men have organized the Buick Motor Car Co., to handle Buick and National cars for western Washington, with headquarters in Seattle. The company is backed by A. S. Eldridge, a contractor; Mel G. Johnson, manager of the Howard Automobile Co., of Portland, and James Fenton; Fenton will be actively in charge of the sales end of the new concern. Johnson will retain his present position and will act only in

an advisory capacity in the Washington company.

Buffalo, N. Y.—The Remy Electric Co., of Anderson, Ind., has opened a service station at the Frey Auto Supply Co., 700 Main street, Buffalo, N. Y.

Milwaukee, Wis.—The Milwaukee Rubber Works, 472-476 Twenty-seventh street, Milwaukee, has taken larger quarters at 1928-1930 Vliet street. The company manufactures inner-liners and other tire and rubber specialties.

Racine, Wis.—A new type of self-starter for motor cars is to be marketed by the Faultless Starter Co., of Racine, Wis., incorporated for $10,000 under the laws of Wisconsin. The promoters are Dr. C. I. Shoop, Samuel Hansen, Mortimer Walker and J. Barker.

Norwalk, O.—The Big garage, located on South Hester street, has been sold by Hawk & Lydy, who have operated it for the past year, to John V. Metz who will continue to operate the garage and repair shop and will handle a line of supplies and accessories. The company has the agency for the Paige-Detroit.

Spokane, Wash.—W. J. Healy, who for the last 4½ years has been in the motor car business in Spokane and for the last 2½ years as manager of the Pacific Motor Car Co., has withdrawn from the Pacific company and will go into business independently. In leaving the Pacific company, Mr. Healy takes with him the Peerless agency and will handle it and the Rauch & Lang electric. His garage and salesrooms are located at 1023 Third avenue.

Columbus, O.—The three-story building at 241 North Fourth street, which is occupied by the Hudson Sales Co., is being thoroughly renovated and remodeled.

Worcester, Mass.—The Pope-Hartford has made a change in its agency at Worcester, giving it to C. D. Brewster, of Marlboro, and Eugene L. Caton, of Worcester. The Caton-Brewster Co. will locate at 758 Main street.

St. Paul, Minn.—The Foster-Lawrence Co. and the Morgan-Bond Co., St. Paul, have rented jointly the garage at 197 West Fifth street. The Foster-Lawrence company handles the Stearns-Knight and Detroit electric and the Morgan-Bond company the Stegeman truck.

Columbus, O.—The Broad-Oak Automobile Co., 521 Oak street, which was recently taken over by a new set of owners, has retained Ira P. Madden in the capacity of sales manager. Ralph P. Atkinson has been placed in the position of superintendent. The other officers were announced some time ago.

Columbus, O.—W. H. Batsdorf and John Borst have opened a garage and repair shop in a new two-story building at 381 South Fourth street, which will be called the Paterson Auto Garage Co. The building is 65 feet square and is equipped with a complete repair shop. W. H. Batsdorf has the state agency for the Paterson and the local company will be the distributer in Franklin county.

Buffalo, N. Y.—Charles E. Flory has secured agency in Buffalo, for the Hudson. A service station will be operated in connection with the local Hudson branch.

Boston, Mass.—V. C. Kraemer, who went to Boston and opened a branch for the Flanders electric, has resigned and returned to Detroit, where he has entered another line. The branch will be changed to an agency later.

Buffalo, N. Y.—W. B. Brayton of Cleveland, O. has been elected president of the Regal Motor Sales Co., the new local branch of the Regal Motor Car Co., of Detroit, Mich., which was formally opened August 19 at 1462-1466 Main street.

Baltimore, Md.—The Marathon Motor Sales Co. is the latest entry into the Baltimore and state of Maryland field. This company is handling the Marathon line of motor cars. The company is temporarily located at 1902 Kennedy avenue, while the service station will be located at garage 10 on Morton street.

Toledo, O.—The Banting Machine and Supply Co. has acquired the M. O. Baker building, 120-4 Superior street, and will install a large motor car display and salesroom. The Baker building, which adjoins the building now occupied by the Banting company, will be remodeled. The first floor car display room will be made entirely public by the installation of an all-glass front.

Recent Incorporations

Akron, O.—Ideal Commercial Car Co.; capital stock, $200,000; to manufacture motor cars, engines, trucks, etc.; incorporators, H. C. Gates, A. Tschants, A. J. Dettoff, M. Stump, E. E. Quirk.

Akron, O.—Dutch Rubber Co.; capital stock, $1,250,000; to manufacture rubber goods and motor car tires; incorporators, E. L. Schnee, C. R. Grant, I. A. Grant, F. E. Sherman.

Akron, O.—Marathon Tire and Rubber Co.; capital stock, $10,000; to deal in motor car tires and rubber goods; incorporators, E. R. Dishm, C. C. Owens, S. Newell, D. McBride, H. J. Crawford.

Boston, Mass.—Cambridge Station Garage; capital stock, $6,000; incorporators, J. J. Guiney, F. W. Roberts, D. J. Murphy.

Boston, Mass.—Republican Motor Co.; capital stock, $1,000; incorporators, N. J. MacGaffin, E. M. Churchill.

Boston, Mass.—Motor Monitor Co.; capital stock, $20,000; incorporators, H. P. Soule, G. W. Chase, R. S. True, Jr.

Boston, Mass.—Co-operative Auto Sales Co.; capital stock, $10,000; directors, W. B. Angell, C. E. Walden, A. E. Meyers.

Brooklyn, N. Y.—Revilo Auto Co.; capital stock, $5,000; incorporators, Philip Roth, Donato Cella, Frank Dunn.

Brooklyn, N. Y.—Generator Valve Co.; capital stock, $2,000; to manufacture motor car parts; incorporators, Harry James, John James, S. Henry Holland.

Brooklyn, N. Y.—Greenpoint Tire Repair Co.; capital stock, $10,000; incorporators, C. E. Keller, A. Kovacs, J. Kovacs, Jr.

Cambridge, Mass.—D. Henry Bonner Co.; capital stock, $20,000; motor car business; incorporators, E. S. Howland, D. Henry Bonner, W. E. Furniss.

Cleveland, O.—South End Garage Co.; capital stock, $5,000; to operate garage and general repair shop; incorporators, A. Haskin, H. Lewis Mock, H. Sadugar, J. E. McNemar, J. Goldstein.

Cleveland, O.—Mutual Oil and Auto Supply Co.; capital stock, $10,000; to deal in greases, oils and motor car supplies; incorporators, M. L. Steuer, H. C. Kellerman, H. Haase, C. F. Franke, A. S. Kraus.

Columbus, O.—Southern Taxicab Co.; capital stock, $10,000; conduct taxicab service; incorporators, James J. Keating, James A. Allen, Thomas Becker, Jack S. Williams, A. D. Carmichael.

Columbus, O.—Southern Taxi-Cab Co.; capital stock, $10,000; to operate taxicab service; incorporators, J. J. Keating, J. A. Allen, T. Decker, J. Williams, A. P. Carmichael.

Columbus, O.—Engle & Vincent Automobile Co.; capital stock, $15,000; to deal in motor cars and accessories; incorporators, C. H. Engle, G. A. Marquardt, F. L. Vincent, C. W. Engle, J. K. Henry.

Dallas, Tex.—Marrs-Lingo Motor Co.; capital stock, $7,500; incorporators, A. A. Marrs, D. C. Lingo, J. W. Fox.

Hamilton, O.—Ideal Steel Wheel Co.; capital stock, $500,000; to manufacture and deal in spring wheels; incorporators, J. E. Strietelmeier, A. F. Parker, D. E. Kirgan, W. C. Taylor, James B. O'Donnell.

Lexington, Ky.—Commercial Auto Co.; capital stock, $1,500; incorporators, J. N. Gibbons, W. B. Williams, E. N. Williams.

Louisville, Ky.—Auto-Print Co.; capital stock, $20,000; incorporators, W. T. Givan, G. S. Washer, A. H. Bowman.

Milwaukee, Wis.—George W. Browne; capital stock, $5,000; deal in motor cars; incorporators, G. W. Browne, T. C. McMillan, Mark F. Browne.

Mount Vernon, N. Y.—West Side Auto Exchange; capital stock, $1,500; incorporators, J. S. Haslett, E. Jones, C. E. Haslett.

Newark, N. J.—Heath Method Co.; capital stock, $24,000; to manufacture supplies; incorporators, H. H. Wilcox, F. C. Overbury, F. A. Heath.

New Castle, Pa.—Lawrence Automobile Co.; capital stock, $40,000; incorporators, L. C. John, G. Greer, Roy Jamison.

New York—Rubberine Tire Filling and Sales Co.; capital stock, $500,000; to manufacture fillings for motor cars; incorporators, J. D. Bridges, J. C. Clarke, G. H. Davis.

New York—Pope Motor Car Co.; capital stock, $100,000; incorporators, F. E. Waldbridge, C. M. Stratton, G. M. Stratton.

New York—A. H. Kasner Tire Co.; capital stock, $10,000; incorporators, A. H. Kasner, A. Massari.

New York—Hurlbert Motor Co.; capital stock, $150,000; incorporators, J. P. Carroll, W. R. Carsweel, F. D. Peale.

New York—Harmon Yount Co.; capital stock, $10,500; incorporators, Daniel J. Hanckel, F. B. Hunt, H. M. Kelly.

New York—Newmastic Co.; capital stock, $250,000; incorporators, O. A. Parker, R. Weld, O. H. Bartine.

New York—Blitzen Co.; capital stock, $1,000; incorporators, W. G. Decker, J. B. Mackie, F. B. Scofield.

New York—Damon-Munson Corp.; capital stock, $2,000; motor car business; incorporators, H. W. Munson, F. L. Damon, C. T. Hopkins, A. Eger.

New York—Tredvent Tire Co.; capital stock, $100,000; to manufacture motor car tires; incorporators, N. A. Sterling, D. A. Sterling, Samuel Bing, Morris Rachmil, Louis Cantor.

New York—Rubberine Tire Filling and Sales Co.; capital stock, $500,000; incorporators, James D. Bridges, J. Curtis Clarke, George H. Davis.

Pomeroy, O.—Pomeroy Automobile and Garage Co.; capital stock, $2,500; to deal in motor cars and operate garage; incorporators, A. R. Clifton, N. L. Davis, T. W. Dorst, W. M. Davis, P. L. Clifton.

Philadelphia, Pa.—Keystone Kommercial Kar Co.; capital stock, $5,000; incorporators, W. C. Wetherill, A. W. Morris, William W. McKim.

Philadelphia, Pa.—Peerless Motor Car Co.; capital stock, $30,000; incorporators, R. W. Cook, O. Chew, G. B. Siddall.

Springfield, Mass.—Federal Chain and Mfg. Co.; capital stock, $200,000; directors, Frank D. Fuller, E. S. Hitchcock, T. W. Irwin.

Tampa, Fla.—West Coast Auto Co.; capital stock, $25,000; incorporators, Victor A. James, Frank J. James.

Troy, N. Y.—Pioneer Motor Car Co.; capital stock, $10,000; incorporators, H. J. Richardson, N. R. Holmes, George N. Nay.

Youngstown, O.—Folberth Carbureter Co.; capital stock, $70,000; to manufacture carbureters and accessories; incorporators, E. A. Hegg, N. Emery, E. A. Tobey.

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MOTOR AGE

VOLUME XXII

CHICAGO, AUGUST 29, 1912

NUMBER 9

The Specifications Sell MOON Cars

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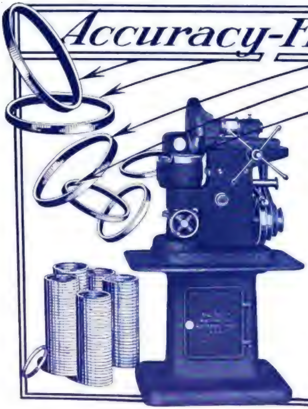

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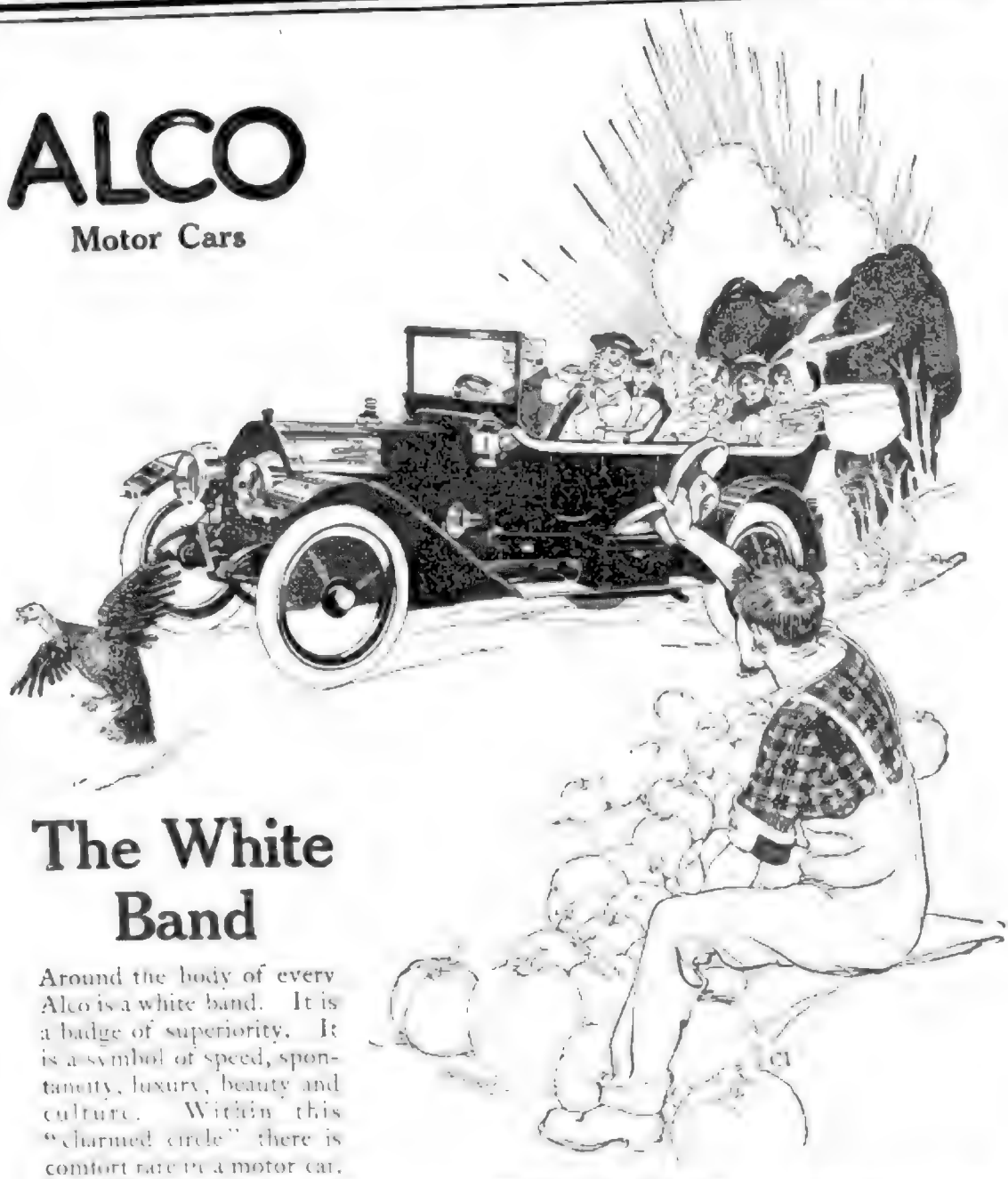
ALCO

Motor Cars



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Around the body of every Alco is a white band. It is a badge of superiority. It is a symbol of speed, spontaneity, luxury, beauty and culture. Within this "charmed circle" there is comfort rare in a motor car. One finds convenience capitalized with a wealth of little things such as wide doors, generous low seats, rich thick carpeting, an illuminated step and hardware wrought to endure.

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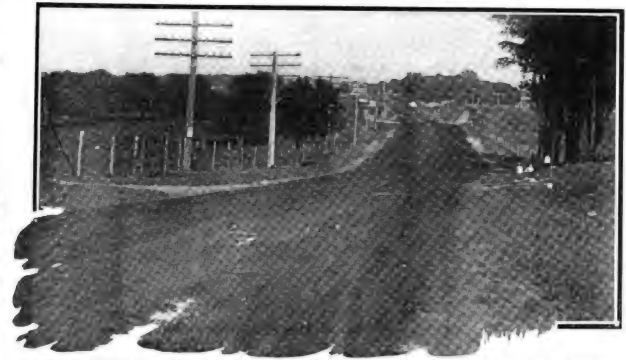
MOTOR AGE

Elgin Races Bring Out Speed Talent



THE HOME STRETCH ON THE ELGIN ROAD RACE COURSE, WITH THE STARTING LINE AND GRAND STAND IN THE DISTANCE

Entry List for Meet of Chicago Automobile Club Contains Many Nominations—Fiat, Benz and Mercedes Among Foreign Talent—Notable Drivers Will Compete —Teddy Tetzlaff Breaks Course Record in Practice

By C. G. Sinsabaugh

CHICAGO, Aug. 27—The Chicago Automobile Club and the Elgin Automobile Road Race Association, with only 7 weeks in which to work, are on the eve of the third annual Elgin road races, with every promise of a most successful meeting. They have a larger entry list than ever before, they have a good course, and there is every indication that they will be favored by a large attendance of enthusiasts.

There will be five events in all staged, non-stock instead of stock, as in previous years, and with a free-for-all for the trump card that has brought together a rare field of American and foreign cars and the pick of the drivers of the country. Benz, Fiat and Mercedes from the other side of the Atlantic will contest for supremacy with such makes as the Knox, National, Mercer, Falcar and Mason, while piloting these will be such celebrities as Teddy Tetzlaff, holder of the world's road record; Ralph Mulford, winner of the Vanderbilt; Ralph de Palma, almost winner of the 500-mile race at Indianapolis; Erwin Bergdoll, winner of the last Fairmount; Hughie Hughes of the Mercer, Spencer Wishart, Charley Metz, Gil Anderson, Neil Whalen and a host of lesser lights. Bruce-Browne was to have driven but his car did not arrive from France in time.

As usual, there will be 2 days of racing. On the first day there will be three events run simultaneously—the Jencks trophy race for cars under 230 inches, the Aurora trophy for 231-300 class cars and the Illinois cup for the 301-450 class. On the second day the Elgin National Watch Co. trophy and the free-for-all will be run simultaneously.

In these five events twelve makes of cars have been entered. There should have been thirteen, had the French Peugeot made good. An effort was made to get

SIDES OF THE COURSE BANKED WITH BALES OF STRAW

three of the French Peugeots for Elgin, E. C. Patterson of Chicago and R. J. Collier of New York offering to import them. It looked as if the deal would go through, for last week Paul Lacroix wired that he had cable advices from Europe to the effect that the cars were on the water and that they would reach New York on the Provence last Saturday. But the boat came in without the cars, and so hope of getting them was abandoned. This led to Patterson nominating David Bruce-Brown for his driver, the car selected being E. E. Hewlett's Fiat, which Brown drove to victory last year at Savannah. Patterson also entered Whalen in the National.

Numerous Newcomers Entered

Many new faces appear in the entry list. The Mason, represented by two different sizes of cars, makes its Elgin bow, while the Rayfield six is in the racing game for the first time. The Rayfield is made in Springfield, Ill.

Owing to the limited time in which the promoters had to work, the course could not be altered much, but then it did not need it. Of course, it would be better if a couple of narrow spots on the backstretch could be widened. This would have been attended to had it been known positively that the races were to be run; but there was so much delay in reaching a determination to have the meet that it was necessary to pass this up for this year. However, the course is in excellent shape today and evidently faster than last year, because of the time being made in practice. The turns at Hornbeek's and McQueen's have been cemented, as has the one at McLean's, so it is thought the racers will not rip them up.

As an additional factor of safety the Elginites are trying out a proposition of Tetzlaff's. That is to put baled straw on the turns so that in case a car does run wild there and run off the course it will hit the bales of straw and possibly save an upset. The straw bales being merely stacked up, the tendency would be to simply check the speed of the car and force it back on the course again.

Practice is Conservative

Although the course was practically ready last Saturday, it was not until Monday that official practice started. Then only six or seven cars came out, and no great speed was developed. The drivers were feeling their way, evidently waiting until today before opening up. The possibilities of the course were shown this noon when Teddy Tetzlaff in the Fiat 70 made four circuits, each one under the previous record for one lap—7:13, made by Mulford in the Lozier last year. His best effort was his second lap, which was covered in 6:55.23, an average of 74.2 miles per hour for the 8.4 mile circuit. Hughes in the Mercer also beat Mulford's old record, turning the trick in

LIST OF ENTRIES FOR THIRD ANNUAL ELGIN ROAD RACES.

JENCKS TROPHY

Friday, August 30, 11 a. m.

96 miles, or 12 laps

No.	Car	Entrant	Driver	Bore	Stroke
41	Mason Special	F. S. Duesenberg	H. Endicott	3 11/16	5
42	Ford 1911 T	Moe Brothers	F. W. Moe	3¾	4
43	Herreshoff 30 1909	Herreshoff Motor Co.	W. G. Waddingham	3⅝	[illegible]

AURORA TROPHY

152.5 miles, or 18 laps

No.	Car	Entrant	Driver	Bore	Stroke
31	Mercer 35 C	Mercer Auto Co.	E. Pullen	4⅜	5
32	Falcar Special 1912	Fal Auto Co.	Hastings	4½	5½
33	Falcar Special	Fal Auto Co.	Wilbur	4½	5¼
34	Mason Special	F. S. Duesenberg	Roberts	3⅞	5
35	Mercer 35 T	Mercer Auto Co.	Wishart	4⅜	5½
36	Mercer 35 T	Mercer Auto Co.	Hughes	4⅜	5

ILLINOIS TROPHY

202 miles, or 24 laps

No.	Car	Entrant	Driver	Bore	Stroke
21	Stutz 1912	Stutz Motor Car Co.	Anderson	4¾	5½
22	Rayfield six 1912	Rayfield Motor Co.	Poole	4	5¼
23	National 40 1911	Fred Cummiskey	Whalen	5	5½
24	Stutz 1912	Ideal Motor Car Co.	Merz	4¾	5½

WORKING ON CURVE AT THE SOUTH END OF TRACK

7:10.52. The two were the only ones who really opened up.

Mulford met with hard luck today when his mechanic, Chandler, was backkicked by the motor, the starting crank hitting him in the leg and somewhat incapacitating him. Later on Mulford had clutch trouble, but it is hoped he will be able to fix it in time to start Saturday.

Good Work by Association

The organization of the meet has been thorough although hurried. The Elgin Automobile Road Race Association, made familiar with the work by 2 years of experience, has attended to a thousand and one details. It has seen to fixing the course, securing the soldiers and most important of all, financing the meet. The insurance proposition threatened to be a stickler for some little time, which delayed matters considerably. No American companies could be found willing to undertake it, and even the English Lloyds quibbled some over the details. At one time it looked as even this would fail, whereupon the enthusiastic Elginites started to underwrite it themselves. Enough were found to raise $15,000 for this purpose, but luckily it was not needed, for Lloyds finally straightened out matters so the policy was issued last week.

PRESS AND JUDGES STAND AT START AND FINISH LINE

ELGIN NATIONAL TROPHY.
Saturday, August 31, 11 a. m.
254 miles, or 30 laps

1	Knox Six	Ralph Mulford	Mulford	4⅝	5½
2	Mercedes	W. H. Bertrand	Clark	5⅛	7⅛
3	Mason Special	F. S. Duesenberg	Roberts	3⅞	5
4	Mercedes	E. J. Schroeder	De Palma	5.2	7.06
5	Fiat Seventy	E. E. Hewlett	Tetzlaff	5¾	7½
6	Falcar Special	Ful Auto Co.		4⅛	5⅛
7	Stutz 1912	Stutz Motor Car Co.	Anderson	4⅜	5½
10	Falcar Special	Ful Motor Co.		4⅛	5¼
11	National 40, 1911	Fred Cummiskey	Whalen	5	5½
12	Stutz 1912	Ideal Motor Car Co.	Merz	4⅜	5½
14	Mercer 35 C	Mercer Auto Co.	Wishart	4.39	5
15	Mercer 35 T	Mercer Auto Co.	Hughes	4⅜	5

FREE-FOR-ALL.
306 miles, or 36 laps.

1	Knox Six	Ralph Mulford	Mulford	4⅝	5½
2	Mercedes	W. H. Bertrand	Clark	5⅛	7⅛
4	Mercedes	E. J. Schroeder	De Palma	5.2	7.06
5	Fiat 70	E. E. Hewlett	Tetzlaff	[illegible]	7½
8	Benz 1911 racer	E. Bergdoll	Bergdoll	6.2	[illegible]
11	National 40	Fred Cummiskey	Whalen	5	5½
15	Mercer 35 T	Mercer Auto Co.	Hughes	4⅜	5

THE HAIRPIN TURN ON THE ELGIN COURSE

In the matter of soldiers, permission was secured easily from Governor Deneen of Illinois to use the militia, and with this sanction troops from Elgin, Aurora, Oak Park, Rockford, DeKalb and Woodstock have been signed to guard the course next Friday and Saturday. In all there will be 250 of the soldiers, more than last year. Extra precautions will be taken this time to keep the course absolutely clear of spectators.

Promotor's Energy Rewarded

The Chicago Automobile Club had a hard task in rounding up the entries and it is to its credit that it was able to list the star aggregation which is presented. Fred J. Wagner, working in the east, and F. E. Edwards, chairman of the technical committee of the American Automobile Association, in the west, are responsible for the thirty-four cars that are booked for the speed battle. The club's cup of happiness would have been filled to overflowing had it been possible to have secured the Peugeots, for it would have given an international flavor that would not have been without its effect on the motoring public of the central west. As it is, though, the club feels well satisfied with the showing it has made in this department and feels that it will stand favorable comparison with what Milwaukee will have to offer. The list of officials included men prominent in motoring, reading in part as follows:

Honorary Referee—George E. Hunter.
Referee—David Beecroft, A. A. A. representative.
Clerk of Course—Morton H. Luce.
Technical Executive—F. E. Edwards.

Ignition Starter Co. Sued on Contract

Aristos Co. of New York, Eastern Distributor of Disco Acetylene Starter, Alleges Violation of Agreement by Detroit Manufacturer in Court Action

NEW YORK, Aug. 27—Word was received today by E. B. McDuffee, president of the Aristos Co., of New York, that suit has been filed in the United States district court for the eastern district of Michigan on behalf of the Aristos Co., demanding damages of $325,000 from the Ignition Starter Co., of Detroit, alleging breach of contract.

According to a copy of the bill of complaint the suit is based upon seven causes of action. The bill alleges that the Aristos Co. has been the eastern distributor for the Disco starter. That as such it purchased upwards of 4,000 starters for more than $50,000 and it complains that the contract conditions under which the starters were purchased were violated by the defendant company in numerous particulars for which damages of $100,000 is dtmanded.

For violation of an alleged agreement not to advertise the Disco in the eastern section of the country except with reference to the Aristos Co. as eastern distributors, $10,000; lack of service, $75,000; various elements of damage and loss caused by the alleged actions of the defendant company, $94,000 and for other reasons, $21,000.

The suit is a law action and the usual course of such proceedings is to reach an issue on the pleadings within 6 months of the date of filing and a hearing soon thereafter.

VANCOUVER HOLDS BIG SHOW

Vancouver, B. C., Aug. 24.—The Vancouver second annual show held under the auspices of the British Columbia Auto and Motor Trades Association and Premier McBride, is now in full swing, and is one of the finest displays ever seen in western Canada. It is being held in the stock judging pavillion, which, in addition to a floor space in the arena of 26,000 square feet, has a seating capacity for over 7,000 people. Last year's display in the machinery building was admitted to be a success, but this year's show is at least five times as extensive, it being estimated that over $1,000,000 worth of cars are now on exhibition.

A pleasing feature of this year's show is that the association under whose auspices it is being held is now representative of the entire trade in this city, so that the exhibit embraces cars of every description—commercial and pleasure, gasoline, steam and electric—as well as a wide range of all motor accessories.

A feature of the show is the display of commercial cars, which is so great that special arrangements will be made in connection with next year's show for a separate exhibit of this class. Some idea of the growth of the motor industry along these lines can be gathered from the fact that a little over 2 years ago there were twenty motor trucks in this city, and at the present time there are over 200.

As an evidence of the interest taken in making a perfect exhibit, the fact may be mentioned that it has cost $4,500 to put the floor in condition to suit the exhibitors. This is in addition to the expense of the decorations which must be seen to be appreciated. The whole interior of the building is covered with artistic decorations the colors of the association, green and gold predominating.

Among the makes of cars on exhibition are the Flanders, Detroit electric, McLaughlin, Glide, Peerless, Hudson, Hupmobile, Stevens-Duryea, Russell, Tudhope, Everitt Abbott-Detroit, Marathon, Federal truck, Cadillac, Winton, Albion truck, Argyll, and Packard.

Vancouver is a motor city. This is not only on account of the saving of time effected for the business man in going from home to office, but because of the pleasure to be derived from jaunts into the country over roads which, through the efforts of the various motor associations are rapidly being put into shape to rival the most famous thoroughfares in the world.

At the present time there are in this city about 1700 power driven machines, including motor cycles and business trucks, the latter of which are coming more and more into favor—through their adaptability to all kinds of work, and the speed with which the work is accomplished compared to that of horse-drawn vehicles.

ATLANTA'S FALL SHOW

Atlanta, Ga., Aug. 22—Plans are going steadily forward for Atlanta's third auto show, which is scheduled for the early fall. Instead of having the show at the tag end of the southern buying season, as was the case last year, this one will be given at a time when southerners are beginning to buy cars, it will come at a time when money is easiest in Dixie and it will come before any other shows have taken the edge off the enthusiasm of prospects. Already arrangements have been made to combine with another exhibition which comes after the motor show in the matter of decorations and in this way the motor show will get the benefit of decorations that cost $16,000 at a price a great deal less than that. Wylie West, acting as chairman of the show committee of the Atlanta Automobile and Accessory Association, is in general charge of the work.

IOWA'S STATE SHOW

Des Moines, Iowa, Aug. 24—The third annual Iowa motor car show held in connection with the Iowa state fair opened August 22, and will continue until next August 30. Thirty local dealers and a number of factories not represented locally have exhibits at the show. It is a business show strictly and no pretenses at decorations are made. The show is being held beneath the steel ampitheater at the race track. As approximately 300,000 Iowa farmers attend the state fair annually, and the farmer is the big source of business for the dealers of this state, the local dealers are expecting many sales before the fair is over. A large number of subagents will be appointed to handle the increased trade expected as a result of the stimulus to be given motor car buying by the agricultural element.

REORGANIZE BERKSHIRE COMPANY

Boston, Mass., Aug. 27—A meeting of the stockholders of the Berkshire Motor Co. was held in Boston a few days ago for the purpose of reorganizing the concern. The Pittsfield Electric Co. recently placed an attachment for $2,500 upon the stock of the company and this brought about the plan to reorganize because of the effect upon the company's credit. It is believed that with the reorganization perfected the company will be able to tide over its difficulties and continue in business. The greater portion of the plant was moved some time ago from the Pittsfield Electric Co.'s building on Renue avenue, Pittsfield, Mass., to Cambridge, Mass.

ATLAS MAY CONSOLIDATE

Boston, Mass., Aug. 27—There is some talk now of the Atlas Motor Car Co. of Springfield, Mass., making a consolidation with a large western truck manufacturing company in case the plan for an increase in the capital stock of the company of $100,000 is not carried out. The receivership of the Atlas Motor Car Co. of Indianapolis prevented the Springfield company from receiving the Silent Knight motors with which it was equipping its cars, so some plan had to be evolved in order to keep the company going and not have the present shutdown of the plant last too far into the 1913 season. Manager P. A. Williams is unable to predict just what course the directors will pursue at the meeting that has been called shortly, at which time the fate of the hoosier concerns will no doubt be decided.

King Motor Car Co. Is in Difficulties

A. Harvey Sons Mfg. Co. Files Petition in Involuntary Bankruptcy Against Detroit Concern—Creditors Meet to Consider Action—Early Settlement Expected

DETROIT, MICH., Aug. 28—Special telegram—At a meeting of the creditors of the King Motor Car Co., held at the Pontchartrain hotel on August 26 it was unanimously agreed that bankruptcy proceedings should be instituted at once against the King company. The stockholders of the company were also in favor of such action. Accordingly, a petition in involuntary bankruptcy was filed August 27 by E. G. Wasey, acting for Graves & Hatch, attorneys for the A. Harvey Sons Mfg. Co., Ltd., of this city, which firm is one of the principal creditors of the King Co. The Harvey company has been furnishing principally flywheels to the King company.

At the present time the judges are out of the city so that the petition will not be acted upon until Monday or Tuesday of next week, when it is probable that the Security Trust Co. will be named as receiver. It is expected that the plant and machinery will be sold to the highest bidder and that the manufacture of King cars will be discontinued at once according to Mr. Wasey. The liabilities of the King company are approximately $361,000 while a representative of The Motor and Accessories Manufacturers' Association recently appraised the assets at $132,000. This, figure, however, is considered to be rather high by the creditors, who believe that a settlement on the basis of 25 cents on the dollar is all that can be expected.

BUSINESS IN NORTH YAKIMA

North Yakima, Wash., Aug. 24—This city, with a population of 15,000, bought 107 cars in 1912, according to figures by dealers there. The sandy, dusty roads through the reclaimed desert lands made the low-priced lighter cars more in demand, as they have been found to stand up better under conditions in the valley.

There were sold in North Yakima in the summer passed sixteen Hudsons, seven Everetts, thirty Fords, eight Overlands, four Reos, ten Studebakers, two Whites, five Velies, one Leverne, five Cases, five Michigans, four Mitchells, three Franklins, three Chalmers, five Oaklands, one Cadillac, two Stoddard-Daytons and one Pierce-Arrow.

ESTERLINE MOVES TO SPEEDWAY

Indianapolis, Ind., Aug. 27—Announcement was made last week of the purchase of one-half the capital stock of the Esterline Co., LaFayette, Ind., by Carl Fisher and J. G. Allison, owners of the Presto-Lite Co. and the Indianapolis Motor Speedway. The capital stock of the company is $250,000. The plant at present located at LaFayette, Indiana, will be moved to Indianapolis, and will locate at Speedway, Fisher and Allison's "Horseless City." There is to be no change in management.

Although no announcement hitherto has been made, it is known that the company has had under test for more than a year, a combined electric starting and lighting equipment for motor cars.

The Esterline Starter is to be unique in many respects, and a rather radical departure from the electric starting devices now on the market. One of the most important lines to be manufactured is a new electric lamp for motor vehicles, which the company has developed.

MAY ALLOW CARS IN PARKS

Washington, D. C., Aug. 28—Whether motor cars should be allowed in the national parks of the country will be a question of discussion at this year's conference of park superintendents to be held in Yosemite National Park early in October.

Secretary of the Interior Fisher decided recently that the problem was becoming so important that it should be studied carefully and he is inviting members of motoring associations and all interested in any way with the question to go to the Yosemite in October to take up the problem.

Hundreds of requests reach the Interior Department yearly asking permission to take cars into national parks and bills granting such rights have been introduced into Congress. All the requests have been denied because of the danger to other travel.

WINDSHIELD LITIGATION

Troy, O., Aug. 27—The Troy Carriage Sunshade Co., holder of the Lingley windshield patent No. 890667, covering shields having the double-arm joint, so constructed that the upper sash can be angled to provide the ventilator, rain view and other positions necessary in a shield intended for fore-door bodies, has taken a decree by consent from the Polson Mfg. Co., of Buffalo, that institution agreeing to discontinue the manufacture of such a type of shield, it is announced. It also has taken a decree by consent from the Sprague Umbrella Co., of Norwalk, O., which institution has arranged to license under the Lingley patent.

IGNITION STARTER REORGANIZING

Detroit, Mich., Aug. 26—Growth of the Ignition Starter Co. is evidenced by the news that this concern is reorganizing and increasing its capital to $500,000. To manufacture the Disco electric lighting, starting and ignition equipment the plant of the Gray Motor Co. has been taken over, giving the Ignition Starter Co. 20,000 square feet of additional floor space. The increase in the capital stock has been based on the increased value of assets of the company and for putting new capital into the business for further developments.

HOLDS STATE LAW SUPREME

Milwaukee, Wis.—A decision by Attorney General Bancroft of Wisconsin that no city, village, county or other form of government lesser than the state can make any laws or ordinances fixing requirements with regard to the operation of motor vehicles which conflict with the state law has brought dozens of cities and villages to their senses.

The state law, which is declared supreme by the attorney general, fixes the speed of motor cars in cities at 15 miles per hour, and on country roads at 25 miles per hour. The object of the law is to make the speed limits uniform throughout the state. Some cities have made limits of 10 and 12 miles per hour, while Milwaukee county has passed a law making the limit on country roads 20 miles per hour. All of these ordinances are outlawed by the decision, although many city attorneys declare they will carry the cases to the highest court to determine if the state has the power to rule absolutely in such cases.

La Crosse, Wis., has an ordinance fixing the speed at street intersections at 6 miles per hour. The attorney general says local requirements are taken care of by the provision in the state law which requires every driver to proceed at a speed which is "reasonable and safe" at all times.

BOSTON TO HAVE TRUCK GARAGE

Boston, Mass, Aug. 27—The Fenway Garage Co. was formed in Boston last week, carrying a capitalization of $425,000, the common stock being $250,000, with $175,000 5 per cent gold serial bonds. The new company has purchased 67,327 square feet of land bounded by Ipswich and Landsdowne streets and the American League baseball park. Plans have been drawn for a two-story building of reinforced concrete so arranged that other floors may be added later. The new company has taken over the taxicab business of Sanders & Butler, and the members of this firm have been engaged to manage the garage. The garage will be planned primarily for trucks and each floor will have an area of 50,000 square feet. At least 200 machines will be taken care of.

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Gauging Public Demand

CAR buyers today are exceedingly fastidious; they are a class that gauges very accurately the trends of car designs; they are a public that must be followed to the hour to be sure of a just estimate of its wants; and a public that will change its attitude in a few short months, in fact, it has been known to change in a few weeks.

WELL illustrated is this in the demand for starters a year ago. One concern in announcing a gas self-starter as stock 1912 equipment stampeded the entire market. Other makers in the same class were compelled to delay announcement until some make of starter was installed. It was not many weeks before every maker of medium powered cars was offering the self-starter as stock or at very little above stock. Several of the makers of high-priced cars did not put on starters; they reasoned that chauffeurs drove the majority of their cars and so the self-starter would not be demanded. By the end of the season not a few of these concerns were compelled to improvise the self-starter or face a surplus of cars at the end of the manufacturing year.

ALTHOUGH scarcely 2 months old, the 1913 season has witnessed several examples of the fastidiousness of the buying public. Some leading concerns announced the fitting of gas starters, but the public pulse had changed, it was not the pulse of 1 year ago, it was not the pulse of 3 months ago, and these companies had to revamp their starter equipment. So suddenly and strongly had the demand for the electric type advanced that they sought safety in it. While some of these leading concerns were aiming at fashioning their own course, at variance with public thought, several smaller makers were playing the role of imitators, saying "What So-and-So can sell will sell our cars." Here, too, was an error. The public had unconsciously framed its opinion, there had not been an outward positive expression on it; and the makers erred, and they erred because they had failed to keep closely in touch with the public pulse every week and month.

THE day is over when a maker can drive the people against their own best judgment. The man who drives the car, the man who rides in it, and his passengers cannot be stopped from framing their own opinions, and factory arguments cannot upset such deep-founded conceptions. The maker today who builds a product that will sell must keep his finger ever on the public pulse. It will not do to do it 3 months in the year, to do it 6 months out of the 12, or even 9; it must be 12 months out of every 12. It is one of the greatest problems the maker has. It is easy to follow. It is equally easy to err. The real facts are the only corner stones on which to build. The maker must learn these. So often rumors are misleading, and they are rarely credited. An illustration of the difference between rumors and facts was recently given by a leading car maker who wished to investigate a certain ignition-lighting outfit. Every other car maker had his reports of failure. From cities all over came similar reports. The wonder was how the company actually contrived to exist. The inquiring manufacturer made a caucus of every dealer selling the product in question. Not every dealer in one state, or in six states, but every dealer in every state in the country. The real facts being obtained every rumor of failure that had previously been so general was dissipated. It was discovered that in scores of cases rumors were based on stories created by unreliable salesmen. True to the laws of gossip these stories grew daily. It would have been easy for any maker to have been lured into dangerous channels by such reports, and only the wise maker, who got the reports, obtained the real estimate of public demand, as evidenced by that particular design.

GAUGING public opinion is a simple task. It merely means to get the facts, and not to base policies on hearsay or rumors. You can always get facts. Getting facts means getting to the consumer, or to some one else who has reached him and on whose statements you can rely. So often a manufacturing firm will leave the selection of a new feature of design entirely to the engineering department. This is all right providing this department keeps rationally close to public desires, but so often the engineering department is the farthest away from the consumer and consequently the last to dictate what shall and what shall not be in the question of car equipment. In factories where the engineering department keeps the field glass constantly focussed on the public, it can chart its course accurately but where the course is laid out within a four-wall room, without due consideration being given to the outside, it is certain that mistakes will be made, that changes will be made before the season is over, and that in every case the maker will have to pay for the experience. It is in furnishing the engineering department with the real facts on the consumer, that the sales and maintenance departments assert their rights to be factors in determining what shall and what shall not be incorporated in a new model. It is as an umpire of these various departments that the factory heads must sit and pass final judgment. By this program of design the manufacturer can be assured of selling at his entire output.

HOWEVER, from this it is not to be inferred that the buyer is an infallible judge of what is best in a motor car. Many good and worthy features have from time to time been incorporated in the design of conservatively designed cars, that owing to public prejudice had to be abandoned after a few seasons of vain attempt at education of the public away from its pet notions. Many features which if developed would have proven of great value, have thus been thrown in the discard. Not so very long ago a certain manufacturer who reputation for unconventional innovations was wide, attempted to introduce a new form of valve. After two or three seasons of desperate pushing he was forced to lay it on the shelf because the public refused to be shown. The comparison of Americans with Europeans in this respect has often been made; the claim that the French and English public was less conservative of standard practices in design, thus offering more encouragement to American inventors than they receive at home. This is undoubtedly true, as borne out by the experience of Charles Y. Knight, but had its root, no doubt, in the fact that the comparatively low prices of American cars are made possible only by our methods of manufacture in large quantities, the freaks of foreign practice being fostered under the expensive small-quantity manufacturing methods prevalent abroad.

Alberta Proud of Its Motor Strength

Claim Made It Has More Cars Than Any of Other Provinces in Dominion

EDMONTON, Alta., Aug. 24—Statistics compiled from government reports show that in comparison to population Alberta has more motor cars than any other province in the dominion of Canada, there being one car to every 124 persons, estimating the population at 374,663 and the number of cars at 3,000. Manitoba is second with one car to every 152 persons in the province, and British Columbia has third place with one auto for every 165 persons. Saskatchewan is fourth with one to every 194 persons. Ontario, which has the largest number of cars in use, reports one to each 344 of its population.

Nova Scotia has the smallest number of cars. The ratio of cars to the population there is the lowest. The province has one car to each 852 of its population, which is placed at 492,38. New Brunswick, with a population of 351,889, has 594 cars, while the province of Quebec, with 2,002,712 population, has 801.

Prince Edward's Laws

Prince Edward Island is the only province in the dominion which prohibits the use of motor vehicles on its highways and public places. The penalty for violating this law, which was enacted because it was thought necessary in the public interest and for the safety of the traveling public, is a fine of $500 or 6 months in jail. Public highway, in this act includes any highway, public street, square, alley, lane, park or any public place.

Transient cars are not registered in the province of Manitoba, where permits are issued for 30 days' touring. After that time the owner is considered a resident and has to take out a license. This law is said to be satisfactory to residents as well as transients.

Representatives of car manufacturers traveling through the Edmonton district report that western Canada is the best field, and local dealers say they cannot get cars fast enough to supply the trade. The people have money and are ready and willing to pay top prices for the best. While many popular priced cars are sold, the dealers find no difficulty in disposing of any vehicle that comes up to the mark.

Demand for Trucks

There also is a growing demand for motor trucks, which are operated at from 10 to 30 per cent less cost than horse vehicles. Market gardeners, dairymen and poultry growers in the rural districts tributary to Edmonton and the western cities generally are employing motor traction power to a large extent and it is predicted that this will have a beneficial influence upon the good roads movement.

It is estimated that fully 25 per cent of the cars exported from the United States is shipped to Canada. The accompanying tabulation shows the value of imports in this line during the last 4 years:

Year	From United Kingdom	From United States
1908	$186,224	$ 714,497
1909	79,954	480,785
1910	114,871	1,644,431
1911	314,182	3,798,589

The foregoing figures show an increase of 68.7 per cent in the value of cars imported to Canada from Great Britain in the last 4 years and an increase of 431.6 per cent in the importations from the United States. The number of cars purchased from the two countries mentioned during the 4 years was as follows:

Year	From United Kingdom	From United States
1908	101	563
1909	48	469
1910	78	1,345
1911	240	3,207

These figures show a gain in number by the United Kingdom of 137.6 per cent, and by the United States of 496.6 per cent. The approximate average value of machines follows:

Year	Average value of British Cars	Average value of U. S. Cars
1908	$1,843	$1,269
1909	1,663	1,026
1910	1,472	1,223
1911	1,309	1,887

Some cars from France are sold in Canada and there are prospects that German manufacturers will do some business next year.

There is every reason to believe that the importation of cars from the United States will grow in proportion to the development and settlement of the country. This, of course, means also there will be increasing demands for tires and accessories.

Assembling Plants Established

American manufacturers have established assembling plants in various parts of Canada and it is announced that trade is brisk and the outlook for the coming year is bright. The western provinces will harvest this year the largest crops of grain, including wheat, barley and oats, in the history of the dominion. The production of livestock also is larger than at any previous time. As soon as the returns come in there will be more activity in all lines of trade. The settlement of vast acreage of tillable lands in Alberta and neighboring provinces too is bound to have a wholesome influence upon the automobile business in general.

Coming Motor Events

*August 30-31—Elgin road races; Chicago Automobile Club; Elgin, Ill.
September 1-3—Ostend meet.
September 2—Track meet at Winnipeg, Canada.
September 3-6—Chicago Motor Club's truck demonstration.
September 8-25—San Sebastian Rally.
September 9—French Grand Prix; Le Mans, France.
*September 9-12—Commercial vehicle run; Chicago Motor Club.
September 11-14—Third annual reliability run of Automobile Club of Buffalo, Buffalo, N. Y.
September 14-21—Annual fall show; Chicago Automobile Trade Association.
September 17 — Grand Prix; Milwaukee, Wis.
*September 20—Wisconsin challenge and Pabst Trophy races; Milwaukee, Wis.
*September 21—Vanderbilt road race; Milwaukee, Wis.
September 17-20—Fire engineers' convention; International Association Fire Engineers, Denver, Colo.
September 26-October 6—Agricultural exhibition and plowing matches; Bourges.
September 30-October 5—American Road Congress; Atlantic City.
September—Track meet; Universal Exposition Co., St. Louis, Mo.
October 4-5—Track meet; Sioux City Auto Club, Sioux City, Ia.
October 6—Gallou hill climb.
*October 7—National tour Detroit to New Orleans; American Automobile Association.
*October 7-11—Chicago Motor Club reliability run, Chicago.
October 12—Track meet; Rockingham park, Salem, N. H.
October 24-25—Santa Trophy Team match, Chicago Motor Club.
November 2-3—Splash guard competition; Versailles.
November 6—Track meet; Shreveport Automobile Club, Shreveport, La.

*Sanctioned by A. A. A.

SHOWS

September 23-Oct. 3—Rubber show, Grand Central palace, New York.
September 26-Oct. 6—Exposition agricultural motor cars, Bourges, France.
October 2-12—Fire show, Madison Square Garden, New York.
November 8-16—Olympic show; overflow November 22-30 Agricultural Hall.
December 7-22—Paris salon.
January 6-11, 1913—Cleveland show.
January 4-11—Montreal show.
January 11-18—New York pleasure car show; Automobile Board of Trade; Madison Square Garden and Grand Central Palace.
January 11-22—Brussels, Belgium show, Centenary Palace.
January 20-25—New York truck show; Automobile Board of Trade; Grand Central Palace and Madison Square Garden.
January 20-25—Philadelphia show.
January 27-Feb. 1—Detroit show.
February 1-8—Chicago show.
February 10-15—Chicago truck show.
February 10-15—Minneapolis show.
February 17-22—Kansas City show.
March 3-8—Pittsburgh show.
March 8-15—Boston show.
March 17-22—Buffalo show.
March 19-23—Boston truck show.
March 24-29—Indianapolis show.

MEXICO STARTS ROAD WORK

City of Mexico, Aug. 24—As a first step in its plans for the construction of an extensive system of good roads, the federal government, aided by different state governments, has begun the work of rehabilitating the famous Camino Real, or main highway, which runs between this city and the port of San Blas on the Pacific coast, with a branch up the coast to Guaymas.

This main highway has a length of about 700 miles, and is a lasting monument to some of the wonderful public works accomplished during the days of Spanish control of Mexico. It originally was constructed more than 300 years ago under the direction of the government of Spain and at enormous expense.

Rules Out for Next Year's Grand Prix

Automobile Club of France Will Allow Only 14.1 Miles to Gallon in Way of Fuel Consumption to Each Car—European Makers Renew Interest in Racing

PARIS, Aug. 16—In its official rules just published for next year's grand prix race, the Automobile Club of France has determined an allowance of 20 liters of gasoline per 100 kilometers,—at the rate of 14.1 miles to the gallon— and fixed a minimum weight limit of 1763 pounds and a maximum of 2425 pounds, without gasoline, oil, water, tools or spares. The total distance of the race, which will be a 1-day event, will be about 560 miles, the course to be about 30 miles round and as near as possible to the city of Paris.

Minute precautions have been taken in the drawing up of the rules to provide against cheating. In addition to a fine of $2,000 and disqualification of the driver, his team mates and the firm proved guilty of an attempt to dodge the rules, the committee has decided that it will supply the gasoline tank, the piping, and all unions. The tank, which will be 39 inches in length and of a diameter to be determined when the total distance of the race has been decided on, must be placed across the frame to the rear of the two seats, it must not be encased or covered in any way, and the car must carry all spare tires and wheels across the frame to the rear of the tank.

The whole of the fuel to be used in the race will be put into the tank before the start; thus if the distance is 560 miles, the amount of gasoline aboard will be about 40 gallons. The gasoline allowance will be made at a temperature of 15 degrees centigrade, with rectification for any variation in tempeature from this standard. When the tanks have been filled on the day before the race, the filler cap will be sealed, all connections on the gas line will be sealed, and a control put on the carbureter, the car then being placed under military guard until the moment of the race. In all probability the committee will allow ½ a pint of gasoline to each man to prime his motor for starting up.

Permission is given the competitors to indicate the brand of gasoline they desire to use in the race, a list of ten different makes being quoted from which a choice can be made. The particular brand selected will be bought from the retailers in the ordinary sealed cans and only opened in the presence of the competitors for measuring and transferance to the tank. No facilities are given to foreign competitors to use their imported home brands of fuel. The construction of the tanks will be such that it will be utterly impossible to put gasoline in without detection.

By means of flanges on the two end plates of the tank, all the rivets will be external, thus forestalling any attempt to pass gasoline in through a hollow rivet; the filler cap too will be of a special type that cannot be tampered with. The disposition of the tank and tires has been decided on with the double object of allowing easy verification and putting all competitors on the same level regarding head resistance.

No attempt must be made to secure a stream line body, the opinion of the racing board being that the grand prix should be a test of motors and transmissions with no artificial advantage gained by the use of an appropriate wind cutting body. Limitation of the amount of lubricating oil and control of the number of tires used in the race was brought before the committee, but owing to the numerous difficulties no restrictions were imposed.

Under the rules any manufacturer can enter six cars at a fee of $800 per car, entries to be received by October 31 and to attain a minimum of forty for the race to be held. In view of the possibility of too large a number of starters the right is retained to reduce the number per firm, starting with the firms having the maximum number of cars entered, by the drawing of lots, or by the running of an elimination race, as may be considered advisable. From October 31 to March 1, 1913, entries will be received at double fees.

There is so much enthusiasm in France for motor racing and such general approval of the fuel limitation rules that a minimum of seventy cars is anticipated. Not only will the younger firms specializing in light medium powered cars come into the race with hardly an exception, but everything points to the return of the older factories having figured in the leading road races up to 1908, among them being Panhard, Renault, Mercedes, Benz, Mors, and de Dion-Bouton. The entry of Peugeot, Lion-Peugeot, Delage, Hispano Suiza, Gregoire, Fiat and Bugatti, is already assured. The English contingent is likely to be heavier than in the recent grand prix race.

PROGRESS OF ALCO TRUCK

Chicago, Aug. 27—With 3,026 miles of its transcontinental trip covered, the Alco truck of Charles W. Young & Co. reached Salt Lake City, according to latest telegraphic information from that city, and is pursuing its course to the coast by way of Ogden, Utah, and Reno, Nev. In making the run to Salt Lake City the truck pounded off many miles over summits, through canyons and along perilous cliff side roads only 6 inches wider than the tread of the truck. In these regions the crew spent considerable time in planking weak bridges to avoid accidents. As topping the freak weather conditions in Wyoming—declared by the oldest settlers to be the worst in a decade—the truck ran into an August snowstorm that swept across the state.

NEW ORLEANS MOTORIZING

New Orleans, Aug. 26—One hundred thousand dollars worth of motor fire equipment is to be installed in the city's new central fire station. It has been decided that all apparatus to go in the new building will have to be motorized. No provision is being made for the care of horses, in anticipation of their impending relegation to the discard.

SOUTHERNERS UNHITCH HORSES WHEN GLIDDEN PATHFINDER PASSES

Milwaukee Course Ready for Racing

Circuit Expected to be in Shape for Training for Grand Prix and Vanderbilt Next Week, When Speed Merchants Will Arrive from Elgin—Roads in Fine Shape

MILWAUKEE, WIS., Aug. 27—A week from today Bruce-Brown, DePalma, Hughes, Wishart, Tetzlaff and the rest of the galaxy of famous road race drivers will be spinning around the Vanderbilt cup course at Milwaukee, making an acquaintance with the turns. The finishing touches are being put on the parallelogram this week, and on next Sunday Contractor Michael Schmidt expects to be able to say to the entrants in the great speed carnival, "Go to it!"

Roads that 3 months ago were mere cow paths compared with the roads needed for high speed motor work are today as wide as the boulevards of the largest cities, and smoother. From 14 to 16 feet roadway width they have been made 40 feet wide, crowned just enough to drain them quickly in case of showers and giving room for four cars abreast should occasion demand that width. The Town Line road is a notable example of the wonder work of the builders, the .9-mile stretch having been widened from 12 and 14 feet—a single wagon track—to 30 feet of the smoothest and hardest road anyone has ever been able to find.

The turns as they are today will hardly be recognized by anyone who was familiar with the roads before the builders started work. The sharp turn from Burleigh street into North Fond du Lac road, at the intersection of Thirty-fifth street, the Milwaukee city limits at this point, is now an easy turn, measuring 120 feet wide at its greatest diameter. All of the land between Thirty-fifth and Thirty-sixth streets has been used in building the new turn. This turn the drivers will strike shortly after passing the start and finish line and will send them into the beautiful 3-mile straightaway on the North Fondy road.

The other particularly sharp turn, from the Town Line road into South Fond du Lac road at Sommerville, has been rebuilt into a round that is practically as good as the first turn. Two giant oaks, which the oldest settlers recall as big trees, have been cut away to give the turn a wide radius; the fences have been tore away and moved 40 feet inward.

The other two turns in their natural state were as good as the two sharp turns now rebuilt, but they have been improved very noticeably. The famous graveyard turn where South Fondy road runs into Burleigh street toward the finish line has been widened to 120 feet and the cars will be able to do their utmost in rounding Wanderers' Rest cemetery. Similar improvement has been made to the easy turn at the northeast corner.

The entry list will be announced a week from today. It contains all of the notables on the space eaters' list. For one thing, Bruce-Brown's French grand prix Fiat will be seen at Milwaukee for the first time in America.

Local interest in the Vanderbilt will be keyed up to the highest pitch by the entrance of a contestant by a Milwaukee man with a Milwaukee driver. Richard H. Knowles, scion of a wealthy Milwaukee family and one of the best known sportsmen of this territory, has entered a Lozier in the Saturday event, the Vanderbilt, with Harry C. Nelson, who has been driving Pope-Hartfords in track races in the middle west for 6 years. Knowles at first intended to strip his 1912 Lozier six for the race, but on further thought decided to buy a new car and have the factory put it in shape for racing.

An idea of the size of the crowd of visitors expected in Milwaukee for race week may be gained from the estimates which the Milwaukee Hotel Keepers' Association is preparing. Two hundred fifty thousand people are being provided for, with a leeway of an additional 50,000 should the situation demand it. The preparations are most elaborate, and it is safe to say that the man who expects to pay for his room and board in Milwaukee during race week will get a good bed and three square meals every day, and it will not cost him a cent more than board and room of the same class in any other city of the continent at any time of the year.

On Thursday noon twenty-two cars, one from the garage of each member of the Milwaukee Automobile Dealers' Association, will leave Milwaukee for Elgin to witness the meet and get a few additional pointers as to the conduct of a race meet under actual conditions.

STUDEBAKER DISQUALIFIED

Minneapolis, Minn., Aug. 27—The Minnesota State Contest Board today disqualified the No. 3 Studebaker 20 entry in the runabout class of the fourth annual reliability tour to Winnipeg. This was the contestant with No. 2 Hupmobile for The Daily News cup. W. H. Soules, the driver, was charged with leaving the course by running around Foxholm, Minn., during the fourth day of the tour. A protest may be filed by Paul H. Bruske, contest manager for the Studebaker company. The Hupmobile was penalized fifty-eight points and the Studebaker was penalized twenty-three points.

To prove the worth of second hand cars, the Zekman Auto. Co., the only dealer in used cars in Minneapolis, entered an old Cadillac in the Winnipeg run. This car, which is 3 years old, went the route, the run to Winnipeg being made without penalization, a broken spring on the return costing 643 points. The car was entered by Zekman to convince his prospects that the second hand proposition is sound.

This car with the Marmon, was one of the only two cars not penalized for mechanical troubles ,the spring breakage not being included in that catagory. It is expected that this performance will prove a stimulous to second-hand sales in the Twin Cities. The aversion to the purchase of used cars in Minneapolis has proven a grave problem, most Twin City traders refusing to take them in trade.

GLIDDEN PATHFINDERS AT GENERAL STORES, POKES, MISS

Wishart Breaks American Track Records

Driver of Mercer Wins Track Events of Columbus, Ohio Automobile Club—Wilcox in Cino Takes Second Place in 200-Mile Race—Many Marks Lowered

COLUMBUS, O., Aug. 26—Records were shattered at the second annual 200-mile race given at the Columbus driving park August 25 under the auspices of the Columbus Automobile Club. The records for 75 miles, 100 miles, 150 miles and 200 miles on a circular dirt track were broken before a crowd estimated at about 35,000. The race was successful in every way and there were no accidents of any kind to mar the pleasure of the afternoon.

Spencer Wishart in a Mercer finished first in 3 hours, 28 minutes and 44½ seconds as against a previous record on the same kind of track of 3 hours and 45 minutes. The others finishing inside the money were Howard Wilcox, in a Cino, time 3:35:10; Johnny Jenkins in a Cino, time 3:35:30; and Neil Whalen in a National, time 3:36:49. Ben Lawwell in a Wescott also was in at the finish but was not in the money.

In all there were ten starters to the spectacular event. They were: No. 1, Charles Elliott, in a Firestone-Columbus; No. 2, John Rainey, in Ohio 99; No. 4, Spencer Wishart, in a Mercer; No. 5, Harry Knight, in a Knight Special; No. 6, Neil Whalen, in a National; No. 7, Ben Lawwell, in a Wescott; No. 8, Johnny Jenkins, in a Cino; No. 10, Fred Radina, in a Cino; No. 11, Harry Matthews, in an Ohio; No. 12, Marion Trexer, in a Stoddard Dayton.

The track was in excellent shape and is considered one of the best in the country. More than 15 tons of calcium carbide was placed on the track to settle the dust and there was very little to annoy the drivers and spectators.

Wishart drove steadily throughout and did not push his car for the first 50 miles. After some jockeying, Wishart took the lead and held it with the exception of a few laps around the 50-mile period. At 65 miles the Mercer led, and never was retired from that position. It was after negotiating 103 miles when Wishart came into the pit for the first time, and then three tires were changed. At that time he was four laps to the good and left the pit still in first place. At 129 miles Wishart again went to the pit for tires and water, and at 180 miles the third stop was made, this time for oil. All told, he lost 10½ minutes in the three stops.

Bad luck followed Neil Whalen in his National when he had considerable tire trouble and some ignition trouble. Both of the Cino cars were in the pit frequently for tires and magnetos.

The Stoddard-Dayton was in the pit several times for engine trouble and later caught on fire. The flames were put out and the car re-entered the race but had no chance. The car was out more than an hour due to the fire. Harry Knight in his Knight Special had engine and carbureter trouble and finally withdrew after making 164 laps. Harry Matthews in his Ohio had tire and engine trouble and finally a burnt connecting rod and withdrew after making ninety-seven laps.

Charles Elliott in his Firestone-Columbus skidded into the fence while coming into the pit and broke the rear axle but resumed after repairs. He finally withdrew after making eighty-nine laps. John Rainey in his Ohio broke a connecting rod on the fourteenth lap and was out of the race for good.

The records broken were: Seventy-five miles by Wishart in his Mercer, 1 hour, 19 minutes and 38 seconds, as against the record of Strang at Columbus, Ohio, July 3, 1909, in 1 hour, 19 minutes and 39 seconds. One hundred miles by Wishart in his Mercer in 1 hour, 40 minutes and 51 seconds, as against Burman at the Columbus, Ohio, track July 3, 1909, in 1:41:00 2-5. He made the 150 miles in 2:34:05, which won for him the Virginia hotel cup.

STARTS NATIONAL ROAD MOVEMENT

Washington, D. C., Aug. 24—During the closing hours of the second session of the sixty-second congress, Representative Carlin, of Virginia, introduced a bill to establish a commission the object of which will be to create a national interstate highway system. It will affect preliminary surveys of seven national interstate highways and the establishment of such highways. These highways are to be constructed from Washington, the capital of the United States, respectively to Portland, Me., Niagara Falls, N. Y., Seattle, Wash., San Francisco and Los Angeles, Cal., Austin, Tex., and Miami, Fla. The bill carries with it an appropriation of $1,000,000 for the making of the surveys, maps, profiles and estimates for the use of congress. The national and interstate highways are to be trunk-line highways, to which branch highways and good roads can be established throughout the country.

The measure was referred to the committee on post offices and post roads and will be brought up for consideration as early in the next session of congress as possible.

If a provision which was agreed to by the United States senate becomes a law, a magnificent boulevard will be built to connect Washington with Mount Vernon. After some opposition the senate indorsed an amendment to the bill which provides for the payment to the Mount Vernon Avenue Association of Virginia of the $120,000 which was loaned to the general government by Virginia in the early days of the republic and never yet repaid. The state of Virginia has assigned its claim to the association and the money, if returned, is to be used in the building of the boulevard.

HIGHWAY BODY CRITICISED

Buffalo, N. Y., Aug. 24—The Automobile Club of Buffalo, N. Y. has come out with vigorous arraignment of the state highway commission appointed by Governor Dix alleging that the abominable condition of the roads throughout the state and particularly in Erie county has been brought about by political favoritism and incompetency. An official statement was made by the club detailing condition in certain localities and addressing several questions to the state executive but no reply has been forthcoming from the governor.

BIG PARADE IN COLUMBUS

Columbus, O., Aug. 27—One of the striking features of the Ohio-Columbus centennial celebration at Columbus during the week beginning August 26 was a fantastic motor parade, which was given under the auspices of the Columbus Automobile Club. A number of prizes of cash were given to those having the best decorated cars. More than 150 cars were in the parade. The line of march included the principal streets of the city and was about 5 miles in length.

SUMMARIES OF 200-MILE RACE AT COLUMBUS, O.

Car.	Driver	Time.
Mercer	Wishart	3:28:45
Cino	Wilcox	3:35:10
Cino	Jenkins	3:35:30
National	Whalen	3:36:49
Wescott	Lowell	Finished.
Stoddard-Dayton	Trexer	Out, car on fire.
Knight Special	Knight	Out, 165 lap, engine trouble.
Ohio	Matthews	Out, 98 lap, connecting rod.
Firestone-Columbus	Elliott	Out, 90 lap, rear axle.
Ohio	Rainey	Out, 14 lap, connecting rod.

Maine At Last to Get Good Roads

Campaign Waged by Motoring Associations of That State Beginning to Bear Fruit in Way of Improvement of Highways—Bond Issue Contemplated

PORTLAND, Me., Aug. 26—Maine is at last sure of good roads. A campaign has been waged this summer and is still being waged that will result in highways fit to travel upon and of such good condition that motorists no longer will complain of the wretched state of roads in the Pine Tree state.

Hardly more than a year old, the Maine Automobile Association has taken up the battle for better conditions and good already has resulted. Meetings held in all parts of the state with Governor Plaisted in attendance as well as the state highway commission opened the eyes of the people to conditions at they have existed. On all sides, from motorists, carriage drivers, farmers and merchants, the demand has been made for goods roads.

Poor Roads Lose Money

It has been realized that Maine has been losing business by allowing conditions to continue as they have. Even this year, many motorists from out of the state have come for their vacation to the playground of the nation and have found the roads so bad they have written home to their friends not to come. They themselves have declared they never would again enter the state until the roads were improved. From the motorists who have stayed away, the merchants and hotels have lost thousands of dollars.

The Maine Automobile Association at once became alive to the situation. It enlisted the sympathy and aid of the Portland Board of Trade and the two organizations have worked hand in hand for good roads. Now the result of their energetic efforts is being seen in improved conditions along the principal thoroughfares of travel.

From Kittery into Portland, the road has been the subject of disgusted criticism for years, but this is now being placed in presentable shape. State Highway Commissioner Parker L. Hardison has contractors at work and good solid roads are being built. The M. A. A. itself laid out a detour route so that the dreaded Kennebunkport woods could be avoided and fairly decent roads enjoyed on the run into Portland. But they have gone still farther than that. One of the worst places in the state is in South Portland, at the very entrance to Portland. All the roads in this municipality are bad, so the Maine association took matters in its own hands. At Cash's Corner, near the boundary line of the city, it has erected an immense sign. It gives glaring notice to all motorists that the roads of South Portland are unsafe for travel and that they should not pass through this section.

The ire of Mayor John A. S. Dyer of South Portland was aroused. He declared that in return for what he termed this insult to South Portland, a campaign would be begun against speeders. But the association kept its sign right there and it still presents its warning to all visiting motorists. Mayor Dyer and the other members of the South Portland city council have been forced to come to time. Already have they started to make improvements. More than that, they have asked the Maine Automobile Association to send a committee to meet with a committee of the council to compromise. The two committees will get together within a few days.

Elated over the success of the South Portland incident, the members of the good roads committee of the M. A. A., J. Clark Seates of Westbrook, D. W. Hoegg, Jr., of Cape Elizabeth and Walter B. Parker of Portland, have extended their campaign farther. A few days ago they took a trip to Brunswick, 25 miles from Portland, and called upon the selectmen of that town.

Ultimatum to Officials

Brunswick is a thriving place. It is the home of Bowdoin college, a great manufacturing town and a way point for all tours through Maine. The roads from Freeport to Brunswick are narrow and mostly of clay. Some of the hills are dangerous and the highway in wet weather is never safe for travel.

The members of the committee presented their case to the officials of the town. They gave an ultimatum. In brief it was that if the roads were not made safe inside of 2 weeks, a sign similar to the one placed in South Portland would be set up on the outskirts of the town and motor traffic diverted in some other direction. The warning had its effect and before the 2 weeks have expired, the selectmen declare they will have their roads put into a safe condition. The selectmen showed a willingness to co-operate and will do all in their power to improve conditions.

Even before the warning was given, the Maine association had diverted 300 motorists from the Brunswick route and sent them into the center of Maine by the way of Lewiston. The Brunswickians have felt the loss in revenue to them and are clamoring for good roads.

The good roads question has entered in the state political campaign as it never has before. Both William T. Haines, the candidate on the Republican ticket and Governor Frederick W. Plaisted, the Democratic candidate for re-election, have declared themselves as in favor of good roads.

In addition to voting for officers at the election in September the voters of Maine will have the good roads proposition placed squarely before them. According to the provisions of the Maine motor law, all the money received for registrations must be devoted to the building and maintenance of good roads. The present year saw about $200,000 collected from this source.

Two Millions in Bonds

Lyman H. Nelson, with this sum as a working basis, has come forward with a proposition that will be voted on by the people of Maine. His measure provides for the issuing of $2,000,000 worth of bonds to be used at once for the construction of good roads. The income received from motor car registrations, which never will be less than $200,000 a year will be used to retire the bonds and pay the interest. A constitutional amendment is necessary to bring this about and it is upon this amendment that the people will vote. Both the gubernatorial candidates have declared themselves in favor of the bond issue and the people in general favor it. It looks now as if it would go through with flying colors and as if Maine, by 1913, would have some of the finest roads in the country.

CONVICTS TO BUILD ROAD

North Yakima, Wash., Aug. 24.—Governor Marion E. Hay of Washington has promised to put 200 convicts at work on state road No. 7, through the Snoqualmie pass in the Cascade mountains, connecting Seattle, Tacoma and other Puget sound cities with the central part of the state. The road which follows the trail over which the early cattle rangers drove their beeves from the Yakima and Kittitas valleys to the sound, is now in good shape for motor cars with the exception of about 20 miles which is only passable. Most of the motor car drivers who have made the trip either way this summer have shipped their machines that distance, although nearly 100 have driven entirely across and ferried the length of Lake Keechelus, cutting off three miles just east of the top.

BUCHANAN KEEPS AXLE PLANT

Buchanan, Mich., Aug. 24—The motor car axle department of the Lee & Porter Mfg. Co. will remain in Buchanan. The deal by which this department was to have been taken over by a Kalamazoo company and removed to Kalamazoo has fallen through. The Lee & Porter company is considering the manufacture of car bodies as an addition to its present product.

High Price of Gasoline Alarms England

Users Organize and Protest Against Charge Made for Fuel—Investigation Made of Method of Distribution and Supply—No Scarcity Anticipated—Conditions in South

LONDON, August 16—The continual rise in the price of gasoline in this country to 37 cents per gallon has been met by organized opposition on the part of the users. Matters were brought to a head during the recent strike of the dock workers in London, the price at many garages being at once put up to almost prohibitive figures.

As a matter of fact, during the period of the strike, there was no actual shortage of supplies, but there was a great fear on the part of many of the retailers that stocks would run down rapidly, and a general shortage prevail. The matter appeared so urgent that the Royal Automobile Club held a conference at the club's premises in June which was attended by importers, retailers and consumers. The conference was held to inquire into various questions connected with the supply and distribution of gasoline in this country, and especially in connection with the existing high cost of the spirit to the consumer. The subject was freely discussed, and it was finally resolved that the Royal Automobile Club be asked to establish a gasoline committee to consist of delegates of the various bodies representing consumers of gasoline to inquire into the whole question.

The whole of the gasoline supply for London is delivered into tanks at Thames Haven, the property of the London and Thames Haven Oil Wharves, Ltd., a public wharfinger, and in that capacity its storage and other facilities are available for importers, merchants, or any other large consumer who might import. Its largest customers are, of course, the big oil distributing firms, but it is quite open to anyone to hire storage and the other facilities afforded by the company at reasonable terms. No monopoly or preferential rights is granted to anyone, and the constitution of the company specifically prohibits it, or any of its officials, having any interest in any oil company, or in any oil distributing business whatever. This company has ample facilities for storing sufficient gasoline and other oils, to meet the existing requirements of the country; an effective plant for separating and distilling work, also apparatus for the filling of tins, tank wagons, etc., and the total storage capacity is estimated at sufficient to supply the whole of the United Kingdom for one year. This company is old and well established, and the custom authorities accepts its reports and statements for taxation purposes.

It has been calculated that the cost of gasoline delivered at Thames Haven, including the return voyage of the tank steamer, is from 6⅓ to 6½ cents per gallon, the latter price allowing for the very high freight of $16.25 per cubic ton. The duty imposed adds 6 cents per gallon to this cost, so that, taking the price at 37 cents there is a difference of 23¼ cents on every gallon supplied to the private consumer. It therefore is obvious that importers of gasoline into this country are making a very high profit.

At a recent meeting held at the Royal Automobile Club, Sir Marcus Samuel, the head of the Shell Transport Co., addressed the meeting, and laid particular stress on the difficulties of transportation from Thames Haven. The investigations proved this is no real detriment, and the provision of other storage accommodation on the lower reaches of the river would not in any way reduce the cost to the consumer, but that the price of the gasoline can be manipulated by the large importers in whatever direction they may deem advisable. Further, that the Shell Transport Co. has obtained the hold of about 75 per cent of the gasoline trade in London, and a large part of that in other parts of the country. It will appear that the large demand for spirit in the United States has taxed the resources of the Standard Oil Co. and its associated company, the Anglo-American Oil Co., to such an extent that its imports have not been increased with the growth of the demand in this country, and until some new and powerful combination make a bid for the British market, the companies referred to are practically in the position of monopolists.

The activities of the committee appointed by the Royal Automobile Club, which consists of members representing all the various motor associations and the large users of gasoline, up to the present have been mainly spent in investigating the method of handling gasoline in this country, beginning with its import, following with its storage and transportation, and ending with its distribution to the consumer, together with the various regulations now in force appertaining thereto.

The committee has, obviously, not been able thoroughly to investigate all questions connected with its inquiry and consequently is not yet in a position to issue any comprehensive recommendations upon the subject. In view of the complaints which are being made, however, that the regulations for the reception and transport of gasoline in the port of London are out of date, and tend to hamper the free and unrestricted supply of the spirit to consumers at normal prices at all times, the committee has felt it desirable to issue a recommendation upon this point and the following resolution was unanimously passed at the meeting of the committee held in July 1912, and a copy forwarded to the Port of London Authority:

"That the gasoline committee recommends that, in order to improve the present method of conveying gasoline from Thames Haven by water, barges propelled by internal combustion Diesel, or equivalent, type engines capable of carrying 1,000 tons of gasoline be allowed to navigate the Thames as far up as is practicable."

From the information at present before the committee it would appear that if the port of London authority will grant permission for the transport of 1,000 tons in single consignments up the river the facilities for local storage will be improved and the possibility of a shortage in the near future owing to labor troubles and similar disturbances will be much reduced. The present consumption of gasoline in Great Britian is 80,000,000 gallons yearly.

Gasoline Situation in Savannah

Savannah, Ga., Aug. 24—Savannah is spending something like $10,000 more for gasoline this month than it spent 3 months ago. It is no secret that most of the gasoline used today, in Savannah and elsewhere, is used to propel motor vehicles or motor boats. Ask any car owner what he pays for gasoline now, and he will tell you 17½ cents a gallon. Also he will inform you that only a few short months ago he paid only 11 cents for the same amount of the necessary fluid.

Cent by cent the price has advanced, while the consumer stood helplessly looking on. Now it has reached 17½ cents, and soon may go to 18 cents or even higher. That is with the refineries.

There is consumed in Savannah today something like 160,000 gallons of gasoline every month. Before the price was advanced consumers spent about $17,600 each month for fuel for their motors. Now they pay $27,200 for their gasoline. Simple subtraction shows that they pay $9,600 more now than they did a few months ago.

In New York city there is said to have been an advance of $250,000 in the cost of gasoline within the past 3 months. It is only because Savannah has fewer motor cars that it does not pay as much. The same thing is true everywhere throughout the country.

Various reasons are assigned for this advance, but the simplest and most plausible is that given by a Savannah dealer in gasoline:

"From every 100 gallons of crude oil

refined," he said, "there are distilled 20 gallons of kerosene and 5 gallons of gasoline. The refineries are stocked up on kerosene and don't want to throw it away. According, they have raised the price of gasoline high enough to make it pay to distill it. Now it covers the worth of the waste kerosene too."

Fuel Outlook in Canada

Montreal, Aug. 23—The cost of running motor cars is increasing. E. A. Hewitt, the assistant manager of the Imperial Oil Co. Ltd., asked yesterday as to the influence which had caused the price of gasoline during the past year to rise about 5 cents a gallon, said that the enormously increased consumption of that product was responsible. From everywhere the greatly increased use of motor cars, launches, and machinery propelled by gasoline-motors had caused a greater demand, and the effect had been felt on the price, especially as production had difficulty in rising to meet the demand.

Out in the west especially, said Mr. Hewitt, where quick work in harvesting the crops is absolutely essential, has the use of traction engines increased, and it is the custom in many localities by the use of engines driven by gasoline to work by means of shifts every hour of the 24 in doing the various kinds of work necessary on the farm.

The price to the garages here now is 20½ cents, and they will charge a higher figure, probably 25 cents. It may be that as soon as the production adapts itself to the new conditions there will be a drop, but this is the situation at present.

LE MANS PUTS ON BIG RACE

Paris, Aug. 13—In adition to the 3-liter class, it has been decided by the racing board of the Automobile Club of the Sarthe to open a class for all comers in its race at Le Mans on September 9. The two types of cars will race on one course, covering the same distance, but those in the big class will be held back at the start a sufficient length of time to make it possible for either one or the other type to win. The 3-liter class already is assured of success by the participation of the following firms: Lion-Peugeot, Alcyon, Schneider, Crespelle, De Bazelaire, Bugatti, Arrol-Johnston, Calthorpe, Koecklin, and possibly Vauxhall. There will be two valveless models, Schneider having decided to enter three poppet-valve models and one of its new rotary distributor 3-liter racers, and Koecklin running with a two-cycle car having a cylindrical sleeve combined with the piston. In the free-for-all class the club counts on the entry of one of the grand prix Fiats which has been bought by a French amateur, the Lorraine Dietrich team, an Excelsior, Mercedes, and Rolland-Pilian.

Arkansas Takes Kindly to the Motor

County in Which Little Rock Is Located Has 2,500 Cars—Fruit Growers Just Becoming Interested in Use of Power Trucks—Roads of State Are Being Improved

LITTLE ROCK, Ark., Aug. 24.—The growth and progress of the state of Arkansas has been marked by the entrance of no factor more potent in its possibilities for the proper development of the state than the adoption of the motor car in all the departments of the commercial life. In this county in which Little Rock is located there are about 2,500 cars, 60 per cent of which are pleasure cars. There are about forty motor delivery wagons and about the same number of large motor-driven trucks for the handling of heavy freight.

In the fruit counties the use of the motor car is in an incipient stage, although the cars and their advantages are thoroughly known. There are a few of the motor trucks in use but the railway advantages are so excellent that the demand for the motor is at a minimum. But this weak demand for the truck is offset by a deep-rooted desire on the part of the fruit growers for the touring car, and the evenings are spent touring through the almost limitless orchards, whose long lines of trees stretch away until they are lost in the maze of the horizon.

In the rice district, which covers several dozen counties which are pictures of rolling prairies, the touring car and the motor truck hold about an equal footing. There is no stretch of land in the United States that offers a smoother track for the motor enthusiast than these slightly banked roads that stretch out for miles ahead, seemingly without end, and sometimes for miles as smooth as the asphalt streets of the cities. On each side of these race tracks—for so they are called—are the rice fields of Arkansas, which have been the wonder of the West. It is here that the advantages of the motor truck are most evident, and their universal use shows the appreciation of the rice growers. In the county in which Stuttgart is located, which is the leading city of the rice-growing district, there are about 132 pleasure cars and about seventy-five motor trucks, which includes all the various types of motor delivery vehicles and large motor trucks, for the handling of the rice. Some of this is brought to Little Rock on these trucks, owing to the good roads. Visitors also are frequently seen in this city from that point, making the trip, which is about 60 miles, in three hours.

In regard to the roads of the state, we can offer only one explanation, and that is the roads were built by Judge Joe Asher. These roads cover the entire state, and were placed on the present high plane by many organizations for that purpose, the most prominent of which is the Arkansas Advancement Association. These roads form a network all over the state, which stretch both north and south and east and west. The best example of the roads in the low country is near Stuttgart, to which city reference has already been made. The finest roads in the northern part of the state are those near the foothills of the Ozarks. The scenery here is unsurpassed. The tourist has only to steer his car over the smooth track, which runs for a moment straight ahead, only to swing unexpectedly with a long graceful sweep around some grassy foothill of the scenic Ozarks. As the tourist nears the city of Little Rock the roads become decidedly better, being macadamized instead of banked with crushed rock. This condition prevails throughout the county, sometimes stretching across several counties, and is the delight of the local tourist, whose cars are seen there continuously.

The demands of the law in this state in regard to the foreign state tourist are of no importance to the law-abiding citizen. The same laws that are in effect in all the other states of the union, in regard to speed, lights, and all the other precautions and logical rules of the highway, prevail in this state and nothing else is required. No tourist license is demanded. The bona fide owner of any other state is respected here, without molestation, and is given all the rights of the local men.

SIZAIRE-NAUDIN SPLIT

Paris, Aug. 12—As the outcome of internal dissentions, the brothers Georges and Maurice Sizaire and the brothers Naudin have severed all connections with the firm of Sizaire-Naudin The financial management being unaffected, the company will continue under fresh engineering control. The brothers Sizaire, who are recognized among the cleverest of French engineers, were pioneers in the small-bore, long-stroke movement and 2 or 3 years ago met with a considerable amount of success in small-car races. It is believed that the four men will obtain fresh financial backing and establish a second Sizaire-Naudin Automobile Co.

PURCHASE RUMOR DENIED

Racine, Wis., Aug. 27—Denial of the report that the Racine-Sattley Co. of Racine, manufacturing fine carriages and vehicles, has been purchased by a large motor car interest, is made by officials of the company here. The reason for the rumor is supposed to be the temporary shut-down of the big plant for inventory.

Australia Through American's Eyes

Harry W. Cooper, Former Chicagoan, Now Selling Cars at Sydney, Reports His Observations on Trade Conditions As He Found Them in the Antipodes—Good Advice Given Yankee Manufacturers As to Australasian Market

SYDNEY, Australia, July 15—Since coming here last Christmas from Chicago and establishing myself in the motor car business in this country, I have made a study of trade conditions in Australia and have had an excellent opportunity of observing things from the Australian viewpoint.

After more than 6 months' observation I have come to the conclusion that the car that has the best future in Australia is a 25-horsepower four-cylinder that will sell here for $1,000 and a medium-priced car that will sell for $2,500. The demand for cars of the Peerless and Packard type is not strong, the demand being limited by prejudice, to a large extent to such cars as Daimlers, Fiats and Napiers. The reputation of American cars has been hurt considerably by the preponderance of only the cheaper American cars heretofore in the Australian market. I am the agent for the Pierce-Arrow car, which is the highest grade American car Australians have seen, the Cadillac being the best representative of the United States previously. When visiting a prospect, on the mention of the Pierce-Arrow car, he immediately puts it in a class with the Ford, Flanders or Hupmobile.

Demand for Big Cars Limited

I do not look for a greater sale than from six to ten cars at $5,000 or more per year in Sydney or Melbourne respectively, as the demand for anything over $2,000 is very limited, and there is a strong natural preference for English products. Such cars as the Packard, Lozier, Peerless, Locomobile, Stearns, Apperson, Matheson and Simplex never have been heard of in this country.

The Rolls-Royce car is considered the world's best here, Madam Melba, who lives in Melbourne, being an owner of one. Medium-priced English cars are in great demand. Two-cylinder or buggy-types cannot be sold here. The prevailing demand is for five-passenger cars, with oversize tires, exceptionally high clearance, substantial springs, short turning radii and right-hand steer.

Sleeve-valve motors, such as the Silent Knight, are not in favor.

The demand is for large radiators, and in small cars the thermo-syphon system of cooling with a fan is given the preference. Long wheelbases meet with favor, and floating rear-axles are demanded. Front axles must be substantial in appearance, a heavy appearance in the steering connections and parts being imperative to sales. The Australian demands that the steering arm be above the axle, and that the tie rod be behind it. Irreversible steering is demanded, and hand and foot control. Carbureters of the double-jet type, gravity fed, meet with the most favor. Fixed or governed spark advance is very unpopular.

EDITOR'S NOTE—The accompanying article on trade conditions in Australia was contributed by Harry W. Cooper, formerly manager of the Excelsior Supply Co. in Chicago, but now a dealer in the Antipodes.

In regard to springs, the American manufacturers have the advantage over the Europeans, as those furnished on British cars are continually breaking and giving trouble, from which difficulties American products are notably free.

Spare Wheels Popular

Stepney spare wheels are popular here, as, due to the dearth of good wheelwrights, demountable rims are rare, although, were it possible to get them properly applied, the demand for them would be strong. Tire competition between American and European makers depends upon price for equal quality, and should American makers offer tires of equal quality to Michelins, Dunlops and Continentals, at the same prices at which they are obtained here, the demand for them would be great.

The majority of motorists still use gas generators, the demand for Prest-O-Lite being limited by the comparatively few service stations in the province. Electric light should prove popular, and a drawing card for such American makers as include it in the regular equipment, although there is some prejudice against their delicacy and susceptibility to damage from road vibration, which is severe on our roads. Tail lamps for Australia must be on the right side.

Australian Tops Poor

Australian tops are generally miserable affairs of sagging khaki. American silk mohair tops meet with favor, provided they are not black, which color in tops the Australian will not countenance. Runabout bodies, to be popular in Australia, must be of the three-abreast type, and rumble seats or rear gasoline tanks are decidedly unpopular, the motorists here preferring a tool box on the rear deck, provided with a brass rail. American bodies are not finished quite up to the European standard, and should undergo improvements to create a favorable impression. A peculiarity of Australian buyers is that a blue car, regardless of its make or price, will not be considered, as this color is universally considered the mark of cheapness and inferiority. Fore door bodies are decidedly popular, and ventilation of the dash is desirable. Windshields made in Australia are vastly inferior to those furnished in America, as those of local manufacturers are made with wood frames and are non adjustable. Most English cars are delivered with five wheels, interchangeable Sanky all-steel and wire wheels preferred.

Regarding the electric situation, the only two cities to be considered are Melbourne and Adelaide. I have a Woods electric on demonstration now in Melbourne and on its first appearance on the streets, it created as much excitement as though a circus had come to town. I could not let it stand at the curb for 10 seconds without I had the running boards covered with people trying to look inside, and others trying to find the mechanism, etc. Sydney is out of the question for electrics on account of the narrow streets and steep hills. I doubt very much of the future of the electric even in Melbourne at the present high price. Consider that I must get $4,000 to get off right with a $3,000 American car. There is $210 duty on the body alone, 5 per cent on the value of the chassis, and 25 per cent of the value of the tires. On account of the heighth of the body, a very large case must be used, and the freight charged is according to the size of the crate; so that when I say that the duty and freight on my car cost me over $1,000, the high price that must be placed on the car in order to make a profit, is plain. Of course on an open car the freight is cheaper, and the body duty is not so high.

The Electric Proposition

If there is a high grade electric selling in the United States for $1,500, which could be sold in Australia for from $2,500 to $3,000, 100 such machines could be placed in Melbourne in the next 6 months. We have our charging system installed, and can take care of ten cars a night with our present arrangements.

Regarding motor trucks, small delivery wagons, of the three-wheel type, with a box forward to carry parcels in are in great demand, as are light 1-ton and under, chain driven trucks. The field has not as yet been broken into by American manufacturers, and the market for trucks of under three tons is promising.

American railway motor cars, motor farm machinery and tractors are now on demonstration, and are making good. Truck chassis are all imported, bodies being built locally. Trucks must have the motor under the hood. An American truck

was delivered to a dealer in Melbourne, and it is said that he cannot dispose of it on account of the motor being under the body.

It would further the sale of American cheap cars in Australia if the manufacturer would give the cars they intend to export a thorough and finished test. More attention should be given to the adjustment of various parts, the car should be given a thorough inspection, and tried out on the road before being placed into the case. If the factory appreciated conditions on this side, when a case was opened containing an American car, he certainly would have pride enough in his car to turn out a finished proposition. When a case containing a strange model of car is opened it usually is known by the majority in the trade, and quite a few owners of cars. If this car does not run right off the reel, smoothly and without a particle of trouble, everyone will knock it as another American fake, making it an almost impossible proposition to market; even if the trouble is no more serious than badly adjusted brakes or a slipping clutch.

I would advise anyone shipping cars to this country in quantities, and having faith in future business, not to send what they have left over from year to year, or what Americans won't purchase, but to cater to and appreciate business that is to be had over here, paying particular attention to quality and finish.

Use Care in Shipping Cars

I understand from a few agents of cheap American cars that their complaints do not meet with the proper attention at the factories. One firm landed twenty cars, and when opened, found the mudguards all damaged and bent close to the body. Any extra accessories desired by the agent should be allowed them at their cost by the factories. Expenses to import the machines certainly are high enough without the factories making an extra profit on the accessories that are regular on the car, but which the Australians do not want, and which should not be credited at a profit by the factory for the same reason.

Ford and Flanders have permanent men residing in Australia, taking care of the interests of the factory and agents, seeing that they are provided with plenty of advertising matter, and supervising its proper use and distribution.

Agents have many cancellations on account of cars promised by the manufacturer to come on a certain boat, failing to appear. The maker sells a car at a certain price, to arrive at a certain date, obtaining 25 per cent of the selling price, as a deposit, telegraphing the agent that the cars have been shipped on a certain boat to arrive at a certain date. When the boat arrives the cars are not there, being held on the American side. Of course cancellation and return of deposit money result.

Motor agents cannot handle supplies as a side-line with success. Other motor agents would not purchase of them. Motor car owners, unless purchasers of the car sold by the agent, would not enter the establishment of a competitor or of the dealer of whom their car was purchased. Conditions are radically different here from those in the United States. Agents for competing cars never meet. They are not congenial. Knockers' clubs are very prevalent in this country. If such an organization as the Chicago Automobile Trade Association could be formed in Sydney and Melbourne it would certainly put the business on a higher plane, to the good of all concerned.

Bushman the Future Buyer

The squatter or farmer in the country is approached from five cities, Brisbane, in Queensland; Sydney, in New South Wales; Melbourne, in Victoria; Adelaide, in South Australia, and Perth, in West Australia. These cities themselves have been worked thoroughly, and the future of the business does not lie there. The agents for the various cars send out salesmen from their salesrooms to the various small cities through their territories, soliciting business from the farmer direct. The competition has arrived at such a point that in the country districts three or four American cars selling for under $900 in the States are sometimes to be seen camped out in some very small town, on the trail of a customer. There are very many small cars purchased in the country, but the competition is very keen, keener, in fact, I believe, than in the United States.

CANADIAN CARS IN AUSTRALASIA

Montreal, Can., Aug. 24—It has been known for some time past that the Montreal office of the New Zealand Shipping Co. has been placing a number of Canadian made motor cars in Australia and New Zealand, but few will be prepared to hear the dimensions to which this trade has grown. During the year ending May 1 last, 1,292 Canadian cars had been sent by New Zealand liners, and it is hoped to forward at least 1,800 during the ensuing year. The total number already shipped from the opening of the summer navigation season to date is 629 and the hoped for 1,800 mark should certainly be reached if not surpassed within a short time.

CARS IN NEW BRUNSWICK

St. John, N. B., Aug. 24—The great increase in the number of motor cars in use in New Brunswick within the last 5 or 6 years is surprising. There are about 700 cars in use at the present time, representing an outlay of $1,400,000, and of this number St. John has 100, costing $200,000. These figures are remarkable because six or eight was the number of cars in this city 5 years ago, and at that time there were not one hundred automobiles in the entire province. The increase, therefore, has been more than 100 per cent per year for the last 5 years.

The prices of cars run from $900 to $7,000, and $2,000 is considered a fair average, as most of the cars purchased are of the grade costing between $1,500 and $2,500. That St. John is interested to a considerable extent in the most expensive cars, can be gathered from the fact that four or five $7,000 cars have been sold here recently. It depends largely upon the class of car purchased as to how long the owner runs it before exchanging it for one more modern. It has been pointed out that as a general thing, when an inexpensive car is bought, costing say $800, it is exchanged practically every year until the better grade of car finally is obtained.

It is generally felt here that this city is particularly hard on cars and that consequently the life of a car is briefer than in most places. Dealers, however, declare that this is not true, as cars for sale here are made with the conditions in view as are cars built for any other city with a large number of steep grades. The life of a car for this province is fixed about 8 years, running on an average about 7,000 miles a year, but it is said that in other parts of the country where the roads are in better condition the life is very much longer.

Lately many of the large business houses have adopted the motor cars for delivery purposes and the big delivery trucks are coming into use also. St. John is considered particularly adapted for motor trucks and delivery cars on account of the number of hills which are so hard on the horses. This city is said to resemble Seattle in this respect. Then again, here winter conditions are not so severe and cars can be used practically all the year round in this climate.

CANADIAN CUSTOMS PERMITS

Tacoma, Wash., Aug. 26—The custom service in Canada has inaugurated a new system of permits which adds greatly to the pleasure in taking Canadian tours in a motor car. With the present arrangement it is possible to get a 7-day permit to drive a car, licensed in the United States, through Canada. This permit is secured from the custom official at the point of entry. Although the permit is issued for 7 days, if one desires to tour in Canada for a longer period of time, it is only necessary to have the permit renewed by the nearest custom official.

CANADIAN OHIO STOCK OFFERED

Toronto, Aug. 27—The Canadian Ohio Motor Car Co. is offering for public investment $90,000 worth of 7 per cent cumulative preferred stock at $100 per share, carrying a bonus of 25 per cent common stock. The manufacturing plant will be established at Colborne, Ont., where the company has been granted a valuable site and exemption from taxes for a period of 10 years.

Motor Routes and Touring Information

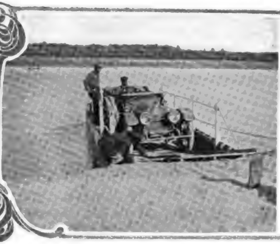
ON THE SAN DIEGO TO LOS ANGELES ROAD

El PASO, Texas.—Editor Motor Age — Having made all arrangements to leave El Paso on April 6, via the borderland route, my family leaving on the fifth, via the Southern Pacific for California, we were compelled to delay until April 9, on account of heavy rains and snow. Advised against doing so, we made the start and got away at 9 a. m. Twenty miles west took us to the New Mexico line, over a paved road, on to Mesquite, 32 miles, the road is fairly good, being graded. From Mesquite to San Miguel we crossed an adobe river bottom flat, which was about as bad, if not the worst part of road on the entire trip. Our wheels were up above the hub in mud and we were compelled to resort to the old team to pull us out, after which we wrapped our rear wheels with ¾-inch rope and went on through all mud without further trouble. At San Miguel we found 2 miles of sand going up to the Mesa lands from river bottom with about an 8 per cent grade; we hired a team there to help us up, paying therefore $2.00. After reaching the top of the hill, we had a fair road to Afton, along the Southern Pacific railway. From thence to Deming, New Mexico, the road is fine, following the Southern Pacific line and newly built highway into Deming. We arrived at 7 p. m. and left immediately for Lordsburg, 60 miles, making the run in 2 hours and 15 minutes at night. From Lordsburg we got on the wrong road and after running all night wound up at a mine and had to return to within sight of Lordsburg to get on the main road to Douglas, Ariz. With good roads, crossing mountains, then Granite Gap, we arrived at Douglas at 6 p. m. Wednesday.

Bisbee is situated high up in the mountains, the elevation being about 6000 feet. The largest copper mines in the world are located here.

We left Bisbee at 10 p. m., not knowing the roads and with meager directions, headed for Huachuca via Hereford. We reached Hereford about midnight and could not locate a road out the way we had been told to go; after running 20 miles out on a wrong road and being near the Mexican border with the Mexican revolution in full sway, we were afraid of getting into Mexico and being picked up, so remained at Hereford until morning. From Hereford to Huachuca is 19 miles; the roads are fine, but some small washes prevent making good time. From Huachuca

SAN MIGUEL HILL, N. M., AND THE TUCSON-PHOENIX ROAD IN ARIZONA



CROSSING THE GILA RIVER AT DOME AND THE COLORAD

to Empire Ranch, about 30 miles, is fair running.

Leaving Empire ranch, we ran through National reserve, a state motor road built up over the mountains, winding around, with about 6 per cent grade and for 18 miles, and as good road as found anywhere. We arrived at Tucson that evening. We had to stay here 24 hours on account of very heavy rains and the road being osier and adobe formation, we were advised not to make the start when we did.

Tucson is on the broad prairie, is a pretty little city with pretty houses and splendid climate, good streets and roads. A state highway has recently been co pleted to Florence, which makes traveli easy. Leaving Tucson, we followed t old road to Florence via Red Rock, runni through mud and water up to the hul this we had clear into Phoenix. Up this time we had no accidents of a kind, no repairs whatever, not even puncture.

Phoenix is a beautiful city with pav streets and fine country roads, in whi the farmer has taken interest and aft a rain one can see numerous drays all directions. This valley is irrigat under the Roosevelt dam and everythi

El PASO, TEX., TO LOS ANGELES, CAL.: THE DESERT SAND ROAD AT GLOMIS, CAL.

THE STATE ROAD AT FLORENCE AND TUCSON, ARIZ.

miles. Business rushed my return and made the trip hard, otherwise, considering the distance traveled, the roads are good and the trip very pleasant, outside of the strip across the sandy desert. We rode the ties on the railroad track for 2 miles, crossing two bridges and one switch. Across the desert is mostly low-gear work and stopping to cool the engine.

Gasoline, oils and water can be gotten all along the route within short runs. The roads through New Mexico and Arizona are very good and especially so in Arizona. A pretty part of the trip is over the San Diego mountains, where one climbs for hours and then down to Imperial Valley, where one goes 160 feet below sea level.

The Borderland route via El Paso, Deming, Douglas, Phoenix, to Los Angeles is unquestionably the only spring, fall and winter route; however, I would not advise any one to make this trip west of Phoenix during the summer months and attempt crossing the desert.—W. T. Rand.

KANSAS TO ILLINOIS

Soloman, Kas.—Editor Motor Age—I would like to have a route given for trip by motor car from here to Princeton, Ind., by way of Kansas City and St. Louis. Does Motor Age know if this road is marked or not?—R. J. Havener.

As Soloman is on the Golden Belt route you should go east through Abilene, Junction City, Fort Riley, Manhattan, Wamego, St. Mary, Topeka, Perry Station, Lawrence, De Sota, Bonner Spring Station, to Kansas City. From this point you will follow the Sante Fe trail through Independence, Levasy, Wellington, Lexington, Waverly, Malta Bend and Marshall to Boonville. Here your route becomes, or is known as, the Boon Lick road. Crossing the river to Old Franklin, then passing through New Franklin, Columbia, Fulton, Williamsburg, Danville, Warrentown, Wright City, Colterville, Wellston to St. Louis.

Crossing Illinois a distance of 156 miles, you will reach Vincennes, Ind. In dry weather the roads are fairly good, routing through Belleville, Shiloh, Lebanon, Trenton, Aviston, Breeze, Carlyle, Clinton, Salem, Zenia, Flora, Noble, Olney and Lawrenceville.

Princeton is 26 miles south of Vincennes and the best roads lead through St.

1

2

3

1—DEEP WELLS NEAR YUMA, ARIZ. 2—ON THE PHOENIX-YUMA ROAD. 3—AT PHOENIX, ARIZ.

NEAR PHOENIX, ARIZ.

APPROACHING HEREFORD, ARIZ.

1—OSTRICH FARM AT PHOENIX. 2—ANOTHER VIEW OF THE ARIZONA STATE ROAD NEAR TUCSON. 3—RESIDENTIAL SECTION OF TUCSON

Thomas, Hazelton and Patoka. This road is good with the exception of after a heavy rain, when one or two stretches of dirt road may be bad. However, it is mostly gravel or macadam.

While at Princeton we would suggest a run to French Lick Springs.

UTAH CLUB PROGRESSIVE

In order to help tourists who are crossing the country, the Automobile Club of Utah has opened a free bureau of information at 251 South State street, Salt Lake City, Utah. Here a register is kept of all cars passing through the city and a system of route cards and maps giving road information in all directions.

Tourists are handed cards and asked to write back to the club giving road conditions and information for others following. By this system the club is able at all times to give the information on the roads.

CORRECTS MISSOURI ROUTE

Chicago—Editor Motor Age—I notice in Motor Age of August 22 a route from Joplin to Sedalia. Having made the run from Chicago to Joplin a number of times, I would recommend as the best route between Joplin and Sedalia, which is a distance of about 190 miles by way of Carthage, Jasper, Lama, and Nevada, to which point there is a gravel road all the way from Joplin, a distance of 70 miles. Continuing to Shell City you strike poor roads and have to cross the Osage river bottom which is negotiable in ordinary weather. In this connection, if the road which Motor Age suggests via Nevada is taken a bad swamp has to be crossed, and if by way of Pittsburgh, Kans., going north to Kansas City on the Kansas side the swamp is also met with, so that no matter which way is chosen, the swamp is encountered. From Shell City the procedure lies through Appleton City, Clinton, Windsor and Sedalia. From my experience this is the best way from Joplin to Sedalia.

By no means go via Springfield. The road is good from Joplin to Springfield, but after that it is almost impassable by reason of there being nothing but natural roads, very rough, very rocky, and an innumerable amount of fords, one or two of which might require a block and tackle.

The Readers

Southener Tells How to Cope with the Hog-Back Roads—Merits of Dry-Plate Clutches—Owner Has Transmission Troubles Resulting from Neglect

Railroading from Ruts

A Mississippi Motorist Advises Strangers to Southern Roads as to Releasing Car

PORT GIBSON, MISS.—Editor Motor Age—I feel that I may offer the following, believing that many may be helped out in bad places. I do not know that others have not tried the same plan but I have not heard of them, and I have used it often and always with success. It is a way to help your car out of the ditch especially when there are high banks across the ditch.

In this part of the country there are many deep cuts that have been made by nature and water, and the roads go down these cuts, which are similar to railroad cuts. Often the road is narrow, hog-backed and slippery, and before you can think you find your wheels in the ditch, and your fenders against the bank on other side of ditch. To put on power and go ahead will ruin the fenders and not help you out of the ditch in the least. And nearly always the middle of the road where the other wheels are is of hard clay. I railroad my car out in the following way:

Take a hatchet or spade and dig a trench about the width of the tire from a point in front of the wheels on solid ground at a slight angle away from the ditch into which other wheels are, then cut into the bank enough to free the fenders or other parts of the car that may be touching, then put on the power and nearly every time the car will come out.

I have, on several occasions, had my car across the road with the front wheel in one ditch and the rear in the ditch on the opposite side of the road and by the use of these ditches and a jack gotten it out without outside assistance. Since the national reliability or Glidden is to tour Mississippi I thought these suggestions might be a help to some unfortunate.

To assist in understanding I have made a few sketches, Figs. 1, 2 and 3 showing the steps in the operation.—L. Briscoe Allen.

STATUS OF DRY-DISK CLUTCH

St. Louis, Mo.—Editor Motor Age—Will Motor Age advise me how multiple-disk, dry-plate clutches, consisting of steel disks and non-burn disks, compare to those of the multiple-disk running in oil?

2—Would not there be a tendency of the dry plates to wear more rapidly than those that run in oil?

3—Have the dry disks that I have mentioned been used successfully by any manufacturer?—Subscriber.

1—The advantages of dry-disk clutches as urged by the growing number of users of this type are the positiveness and ease of engagement of the multiple disk, superior facility of disengagement, absence of grab, simplicity, ease of adjustment, smaller spring pressure required, and fool-proof qualities. The theory is that, like the multiple disk, the dry-disk clutch has a greater surface than the cone, and therefore is softer in action and more positive in grip than the cone expansion and kindred types. The most popular type consists of the regular multiple-disk assembly, with alternate disks faced with raybestos. This material will resist wear without heating, and possesses excellent friction qualities. By the elimination of oil, the clutch is made fool and trouble proof, it being necessary to wash it out with kerosene once a month. Disalignment if not excessive is not serious with this type.

Dry-disk clutches have been run as much as 50,000 miles without replacements, it is claimed, which speaks well for the wearing qualities of this type.

The local branch of the F. B. Stearns Co. reports that 80 per cent of the wet-disk clutches with which the Stearns was formerly equipped have been replaced with the new dry-disk type.

2—Dry-plate multiple-disk clutches are used by the following manufacturers with evident success:

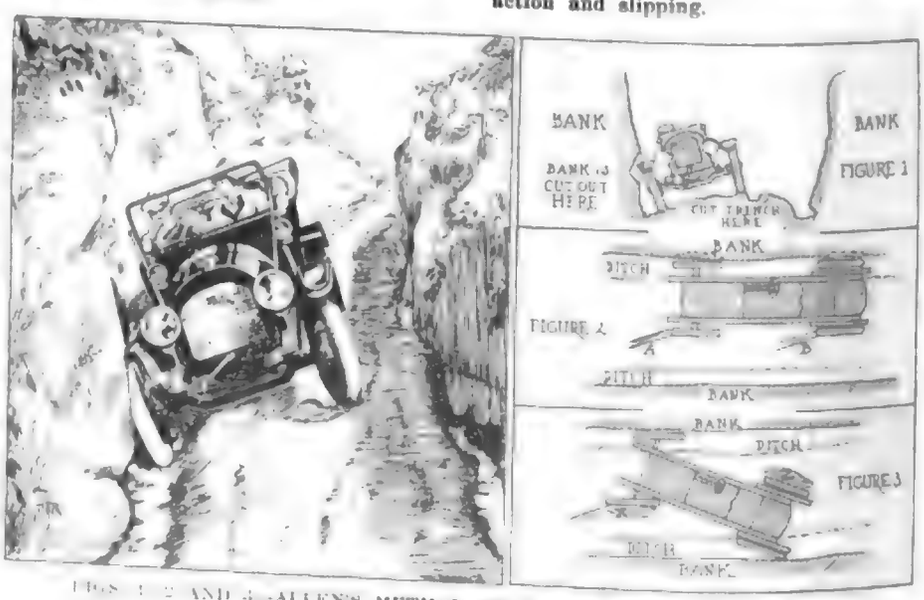
Packard Motor Car Co., American Automobile Mfg. Co., Velie Motor Vehicle Co., Simplex Motor Car Co., Dorris Motor Car Co., Selden Motor Vehicle Co., F. B. Stearns Co., Palmer and Singer Mfg. Co., Alpena Motor Car Co., Auburn Automobile Co., Clarke-Carter Automobile Co., Henry Motor Car Co., Knox Automobile Co., and the Atlas Motor Car Co.

Clutch Needs Cleaning

Savage Clutch Puzzles Keystone Motorist Who Tried Adjustments, But No Oil

AVONMORE, PA.—Editor Motor Age—I have a 1909 Maxwell 30-horsepower touring car and I am having trouble with the multiple-disk clutch. It will run along for about 25 or 30 feet before it takes hold, and, when it does, it grabs quickly, jerking the car. I have had this clutch out, adjusted it in every possible way, but it seems impossible to get it to engage properly. Please advise me what to do with it. I never have drawn the oil out of it or used carbon oil on it. Possibly, this would make it engage easier. In changing the speeds it is impossible to pick it up, for when it takes hold so quickly, it kills the power. Please advise me how to remedy this evil.—Constant Reader.

Your disks are glazed. Drain out the oil and flush thoroughly with kerosene. With the kerosene in the clutch housing, run the motor a few moments, operating the clutch, as the glaze on your clutch probably has become very hard through long neglect. After this drain out the kerosene thoroughly and replenish with new oil. Multiple-disk clutches should be flushed with kerosene once a month in ordinary running, which will keep them in prime condition and prevent damage to the other parts of the car through savage action and slipping.



FIGS. 1, 2 AND 3—ALLEN'S METHOD OF GETTING CAR OUT OF DITCH

Clearing House

Why Carbureters Catch Fire and Methods of Prevention—Fears of Austrailian for Magneto Without Grounds—Three-Wire System Explained—Bosch System

Treating Carbureter Fires

Kentuckian Fears Effect of Carbureter Fires - Methods of Extinguishing Them

TRENTON, KY.—Editor Motor Age—I have heard of several instances where cars catch fire in the carbureter and are burned. Why do carbureters catch fire?

2—How can this be best prevented?

3—What should I do in case of fire?

1—Fire in the carbureter is caused by the motor back-firing into the mixing chamber. This seldom causes the carbureter to actually catch fire, the live flame usually spitting from the air intake. A greasy or flooded carbureter is more likely to burn in this manner than is one which is kept clean. A fire in the carbureter can do much harm by burning the cork float, and the gasoline in the float chamber, which would be replenished by the float-feed mechanism as fast as burned; the destruction of the float, and the melting of the soldered connections, resulting in a dangerous conflagration unless steps be taken to prevent it. If a flame-destroying coil is not provided in the supply pipe, the fire may even reach the gasoline tank, and explode it.

2—Such a fire can be prevented by adjusting the inlet valves or regrinding them, so as to preclude the possibility of a back-fire through the carbureter, except under mishandling of the throttle, viz., too sudden acceleration. The danger from a back fire may be minimized by keeping the gasoline level sufficiently low to prevent flooding, and frequently swabbing off the carbureter surface. No carbureter should be applied without a flame-destroyer, which consists of a coil in the feed pipe through which flame will not pass.

3—In case of such a fire, the gasoline should be turned off at the tank, and the burning parts treated with a good fire extinguisher or smothered with sand or mud. Such a fire would take place on the metal and incombustible parts of a car, and if the fuel is shut off, little damage can ensue except to the solder, and to the float if it be of cork.

OVERHEATING MAGNETOS

Cobargo, N. S. W., Australia.—Editor Motor Age—How much heat will a magneto endure? In my air-cooled Metz the magneto is bolted to the crankcase and, to the touch, gets very hot when on the road.

2—Are there any instances of overheating of the magnetos through faulty position?

3—Is not the armature insulated with wax?—Dr. H. Lister.

1—There is no danger of overheating the magneto on a gasoline motor.

2—There are instances where the placing of a magneto too close to the exhaust pipe, especially on motorcycles, has caused the burning of the lubrication of the timer and bearings, but none to our knowledge wherein the windings or insulation have been affected.

3—The armature of a magneto is insulated with wax and varnished.

The varnish will stand all the heat the engine will produce. If magnetos were susceptible to overheating, they would not be used as they are for racing.

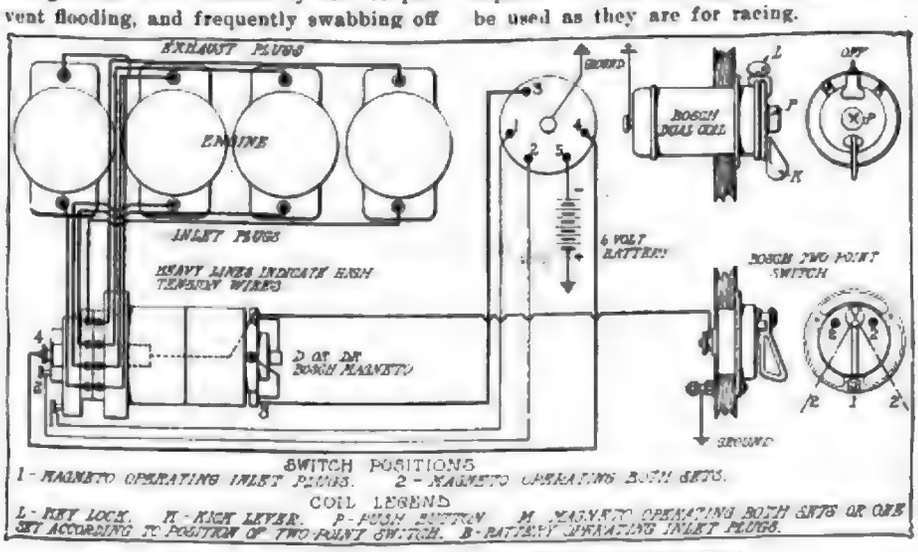


FIG. 4—DIAGRAM OF BOSCH DUAL TWO-SPARK SYSTEM

The Three-Wire System

Re der Is Curious About Rumored Innovation in Kissel Electric Arrangements

ALBANY, N. Y.—Editor Motor Age—What is the Edison three-wire system as will be used on the Kisselkars, and of what advantages is it?

2—Does the Bosch Magneto Co. install two ignition switches, one independent of the other for the dual multi point ignition, as used on the double distributor magnetos? If so, would like an explanation and diagram of the wiring in detail so that all currents may be traced. Also does the manufacturer who installs this system make all connections the same?

3—When starting a motor with a Bosch dual ignition, the switch is turned to the battery and the arrow on the push-button turned to the position marked Start on the face of the switch, and when switched to the magneto the arrow on the button points to the position marked Run. What influence on the ignition has the turning if this push-button?—John Bastian.

1—The Kisselkar announcement for 1913 has not yet been made, although it is generally understood that the three-wire system of ignition will be used in the new models. This system, as usually employed consists of a form of wiring wherein the total voltage is conducted from the current source by means of two outside wires positive and negative respectively, between which a neutral wire is connected to the current source so as to conduct but half the voltage of the outside circuit. Thus, in a battery of six cells, having a total voltage of 12 volts, across the outside wires, the neutral wire is connected between the two sets of three, wired in series, giving 6 volts across the neutral wire and either of the outside wires.

2—The Bosch two-spark dual system includes two switches, one a two-point kick switch, the other the switch of a Bosch dual coil. The system is illustrated in Fig 4. As is shown in the legend, the manipulation of these switches permits sparking on one set of plugs on either magneto or battery, on both sets of plugs on magneto. For proper running, the connections should always be as designated by the manufacturer of the system.

3—The purpose of the push-button on the Bosch dual coil is to cut out the vibrator on the coil when in run position, the current being broken only by the interrupter, while in the starting position the current is broken by the vibrator, which produces a very large and intense battery spark, ideal for starting, but having too much lag for running, hence being cut out when the motor starts. The new system consists of a turning button, instead of the former push-button, the turning being for the purpose of locking it in starting position.

Small French Motors of High Power

Reader Explains How Great Speed Is Obtained from Little Foreign Engines—Question of Efficiency—Road and Air Resistance—Underslung Rights

INDIANAPOLIS, IND.—Editor Motor Age—I beg to add in the Readers Clearing House a few words to the replies to the questions of J. N. Brightwell, of Atlanta, Ga., issue August 1, 1912, page 27.

His first question asks how some of the French motors of small size have been made to develop exceedingly high horsepower. The answer in a nutshell is large gas passages and valves, and light reciprocating parts, and perfect balance. The former gets the power, the latter enables the motor to endure such power. Right here I will say the English have been far more successful than the French, especially in getting endurance with speed, and all because of practice on Brooklands track. A few instances: Sunbeam has a four-cylinder, 3.15 by 4.73 inch motor, 148 cubic inches developing 58 horsepower at 2,400 revolutions per minute; valves are 1.9 inch in diameter; lift ½ inch; weight of piston 1 pound 7 ounces.

Singer has a four-cylinder, 3.15-inch by 5.12-inch motor, 160 cubic inches, developing 66 horsepower at 3,000 revolutions per minute; valves are 1¾ inch intake; 1⅜ inch exhaust; lift ⅜ inch; weight of piston 1 pound; connecting rod 1½ pound.

Austin has a four-cylinder, 3.5 by 4.5 inch motor, 175 cubic inches developing 72 horsepower at 3,000 revolutions per minute; valves are 2 inches in diameter; lift ½ inch; weight of piston 1 pound; connecting rod 1½ pound.

Vauxhall has a four-cylinder, 3.54 inch by 4.73 inch, 184 cubic inches developing 83 horsepower at 3,000 revolutions per minute; valves 2 inches; lift ½ inch.

Chas. Faroux, editor of L'Auto and a French consulting automobile engineer, worked up a four-cylinder motor of 3.15-inch by 5.12 inch size, 160 cubic inches, to develop 78 horsepower at 3,300 revolutions per minute; valves 2⅞ inches diameter; lift 0.4 inch.

Large and high-lift valves mean large manifolds in order to get the advantage of them, 1¾ inch inside diameter, intakes being used.

Of course these motors have good clearance, the difference in diameters of piston and cylinder being about 15/1000 inch and they use two-spark ignition of course. But they are not extremely high compression motors, a compression ratio of about 1 in 5 being mostly used and although the valves raise quickly and close quickly, 150 to 200 pounds per inch valve springs being used. The extreme timing used to get peak of horsepower curve to come as high as 2,100 to 2,200 revolutions per minute on the small-valve American racing motors is found not necessary on these motors. In fact the time all runs close to the following: Exhaust open 36 degrees before bottom; close at top to 90 after. Intake open at top to 12 degrees after, and close 27 degrees after bottom. This conservative timing means that the motor will idle slowly, the speed range of Austin motor mentioned above being from 140 revolutions per minutes to 3,000 revolutions per minutes, peak of horsepower curve at 3,000 revolutions per minute.

Secondly, Mr. Brightwell asks why a high-powered car is not as efficient as a low-powered car, pointing out that almost any stripped stock car can do 60 miles per hour while a 90 horsepower car is hardly able to show over 80 to 85 miles per hour. Motor Age mentions wind resistance and there hit the nail on the head. Weight is a factor in maximum speed on the level as regards acceleration only, that is, getting up speed. Of course, in hill-climbing weight is of more importance and you will note more of a difference in the hill-climbing performance of low and high-powered cars than in maximum speeds on the level. In the first place, in answering Mr. Brightwell the high-powered car is as efficient as the low-powered one. Friction and road resistance horsepower is very small, being about 9 horsepower at 70 miles per hour for the average American race car and 7 horsepower at 70 miles per hour for the average car raced on Brooklands, and varying directly with the speed. The main article to contend with is wind resistance, average horsepower to overcome which for average American flat-front, two-passenger race car is about 31 horsepower at 70 miles per hour and about 25 horsepower for the pointed front one-passenger cars as used on Brooklands at 70 miles per hour and varies as the cube of the speed of the car.

In fact two formulas which I have derived will illustrate.

P = horsepower required to drive car.
S = speed in miles per hour car is to be driven.

For American flat-front two-passenger race cars

$$P = \frac{1.338}{10} + 0.0080083 S^3$$

For English stream-line one-passenger race cars, also light in weight,

$$P = \frac{S}{10} + 0.0000738 S^3$$

The first term is the horsepower to overcome friction and road resistance and is smaller than what most people consider it to be but I can prove that I am correct. The second is the horsepower to overcome wind resistance at ordinary atmospheric pressures and on a calm day.

A few examples:

The Sunbeam car mentioned above has a flying ½ mile record on Brooklands track of 87.3 miles per hour. Singer, the same at 90.04 miles per hour. Austin, the same at 93.79 miles per hour. Vauxhall, the same at 100.04 miles per hour.

In America the stock-sized National four-cylinder 4⅞ inch by 6 inch motor, 447 cubic inches, developing 113 horsepower at 2,000 revolutions per minute; valves 3 inches in diameter; lift ½ inch; can show 104 miles per hour.

The Blitzen Benz four-cylinder, 7.29 inch by 7.87 inch, 1,310 cubic inches, developing 225 horsepower at 1,575 revolutions per minute, has a flying mile record stream-line body at 141.7 miles per hour.

It is easier to get at foreign data, for those on the other side of the water have been doing so very much experimenting.—A. L. Sheridan.

UNDERSLUNG RIGHTS

Des Moines, Ia.—Editor Motor Age.—What company owns the underslung frame patent?

2—Under what right can the Regal and Colby use this frame?

3—Is there any concern which makes demountable rims which can be attached to the ordinary clincher rim without much alterations?

4—What is the estimated output of cars for 1912?—M. J. Probert.

1—There is no underslung frame patent, as there is nothing patentable in the idea. Inverting the frame involves a number of dynamical differences in the manner of suspension, but changes in no way the principle of suspension of the chassis members from the axles. The underslung idea is not new in mechanics, but only in its application to motor car construction.

2—The Regal, Colby, Norwalk, Krit, Omaha, and about nine other motor cars that have in recent years adopted the underslung idea, are under no other than moral obligations to its originators, the American Motors Co., for its use. It has been predicted repeatedly by this latter concern that this type of suspension would eventually become standard.

3—There are no demountable rims now on the market that may be applied to the felloe of a wheel intended for clincher rims, without alterations.

4—As near as can be estimated, the output of motor cars for the year 1912 will probably reach over 220,000 cars.

Charging the Batteries With a Windmill

Method of Recharging Accumulators by Wind Power—Economy of Tungsten Lamps—Factory Tests of the Cars—Voltage of Bosch Magneto

MAYVILLE, N. D.—Editor Motor Age—Is it possible to use a windmill to run a dynamo to charge storage batteries for electric lighting and use a gasoline engine in case of emergency?

2—Must a dynamo run at one certain speed to charge storage batteries?

3—What kind of mechanism is used on the Cadillac to cut off current from the dynamo when the battery is fully charged and what is it that puts it on again?

4—What makes the tungsten electric lamps take less current than carbon filament lamps?

5—How do engine factories test each part of their engines to find out if any part is defective?

6—Does it take more power to run a dynamo to charge batteries than you would get power from an electric motor run by storage batteries?—A Subscriber.

1—A windmill preperly applied to a direct-current dynamo can be used to charge batteries. Some form of cut-out or governor will have to be used to prevent overcharge in case of a strong wind, or leakage back through the dynamo from the battery in case of a lull. Many dynamos are equipped with such devices. Those that are not should be provided with a suiable fuse to prevent overload of current, and a magnetic switch to break the circuit if the production of the dynamo falls below a certain minimum, at which the direction of flow of the current would be reversed.

2—A dynamo need not run at a constant speed to charge batteries, although it must keep between certain limits as explained above.

3—The Delco system, used in the 1912 Cadillac, prevents overcharge and recharges by means of a controller which through an automatic cut-out allows the batteries to be charged up to a certain limit, when it automatically cuts them out of the dynamo circuit, making the contact again when the charge falls below a certain minimum.

4—To understand the economy of the tungsten, it is first necessary to recall the principle upon which all incandescent electric lights work. Certain metals have more resistance to the passage of an electric current than others, for a given size and quantity. Also of metals possessing the same resistance, some will be acted upon differently by the passage of a current of electricity through them. Thus in an electric light bulb, the filament consists of a fine wire of carbon or tungsten steel, which, owing to its size and composition, offers resistance to electric currents. This resistance to the current causes the delicate wire to become hot. In a vacuum, this heat, due to the lessened radiation in the rarified atmosphere about it, becomes very intense, yielding a white light. Now, given a certain resistance and consumption, some metals are more affected by this friction than others. Thus a wire of high carbon steel will become hotter under the influence of a strong electrical passage than will one with a lower percentage of carbon. In exactly the same way it has been found that, offering no more resistance to the passage of a current of a certain intensity, its consumption being therefore no greater, a filament of tungsten steel would become hotter, thus giving off a brighter light than a carbon filament of corresponding resistance.

5—There are a great many tests applied by different factories to check up the same part of a motor car, and many tests performed by each manufacturer for the many parts of a motor car. To attempt to enumerate them would be folly. In a general way, however, the tests may be classified as follows: Micrometer measurements, wherein each finished part is inspected and measured for size, in the best practice to as narrow limits of tolerance as 1/3000 inch, i. e.—parts to be passed must be within 1/3000 of an inch to the measurement specified, before they will be passed. Physical tests which are confined mainly to the testing of the strength and endurance of the materials which go into the make-up of the car. These consist of the subjection of samples to breaking, bending, twisting, and tensile strains, to vibration, heat, and impact, and to cutting and friction. Chemical tests, which embrace chemical analysis and laboratory tests and experiments. Jig and templet tests, to determine the fit of component parts, which is mainly confined to process of manufacture as distinguished from tests subsequent to completion. Manual tests, such as the rapping of castings, inspection for flaws and defects not of material nor measurement. And practical tests, such as actual running of the parts, and their adjustment, motor tests on the block and brake, dynamometer tests, and road tests.

6—Due to the friction of parts and the electrical leakage and inefficiency of the generator, it takes more power to run a dynamo than it will produce in the form of electrical energy. In the same way, owing to the loss in electrical transmission and the inefficiency of the storage battery, as well as the omnipresent electrical leakage, no battery will receive the full power generated by a dynamo. Further, no motor will use the full amount of current conducted to it from a storage battery or any other source or reservoir of electrical energy, because of loss in electrical transmission, and the inefficiency of the motor, and as before, to electrical leakage. And lastly, no motor can convert the full amount of current it uses into power. In short these devices are only to a limited extent efficient or economical, and however near their efficiency may approach 100 per cent, it can never reach it, for there is no perfection in nature. If dynamos, motors and storage accumulators were 100 per cent efficient, we would have perpetual motion; until that time, however, such ideas as getting as much out of a mechanical appliance as is put into it, or in other words, the total elimination of all waste, will be beyond the practical.

BOSCH MAGNETO VOLTAGE

Wimbleton, N. D.—Editor Motor Age—Please tell me through the columns of the Readers' Clearing House what voltage the Bosch high-tension magneto is capable of generating.—Magneto.

Bozeman, Mont.—Editor Motor Age—In the Readers' Clearing House columns will Motor Age state the average voltage of the ignition current at sparking points from a modern spark coil and from a Bosch high-tension magneto?—W. T. Lovell.

It is impossible to give definite figures of voltage, but it generally ranges from 10,000 to 15,000 volts. With a Bosch D4 instrument at 300 revolutions per minute the voltage is approximately 10,000, and if this magneto speed is doubled the voltage will increase perhaps 10 per cent. Voltage always increases with an increase in speed and lowers when the speed is reduced. With this voltage the amount of current flowing or the amperage is less than .5 ampere, this instrument being essentially a low amperage one.

With high-tension magnetos the current generated is short-circuited at a predetermined point, the resulting discharge of pent-up current is through the secondary winding, a fact which makes it hard to give maximum voltages and amperage as this depends on rapidity of rotation and magnet strength. In measuring voltage the spark gap is used, the standard of measurement being the distance the spark will bridge the gap.

With the ignition coil and battery both voltage and amperage depend on the battery and the coil. If you have a strong battery and a large coil you will get as high as 15,000 volts and the current consumption may be 3.5 amperes. It is general with spark coils to give voltages from 12,000 to 15,000 with a current consumption of 2.5 to 3.5 amperes.

Carpenter Explains a Motor Jerk

Mysterious Irregularity Traced to Carbureter—Benzine Sometimes Adapted to Use in Gasoline Motors

SAUK, CENTER, MINN.—Editor Motor Age—When visiting with a friend who owned a motor car he asked me if I could tell him why the motor would jerk when it first started off, and as soon as it speeded up it would run fine, although it would stagger and jerk at times even on the high gear. As I had been a driver of cars for a long time I must now face this request and find the real cause of this condition or be called a poor mechanic.

The car was in fine order, and after going over the places where this trouble was likely to be and not finding the cause of this jerk and jump motion of which he spoke I concluded to try the car on the road to see from personal observation how it acted in order to promptly find the true cause and remedy it. I cranked the motor and it would not respond. I then primed it with gasoline and the third turn of the crank it went, but soon it settled down into the jerk-and-vibrate class and finally made several spasmodic efforts and stopped. I repeated my priming and was rewarded by a prompt reply. I got into the car and advancing both throttle and spark got out of the garage and into the road, but that was about all. At the moment I went into high gear the car made a few jumps and staggers and subsided. Now I was into it truly and tried to get it to go but go it would not. By dint of trying I succeeded in getting the motor started again and limped back into the yard and got into the garage somehow.

I learned the cause of the trouble, if I did get laughed at for my pains. The carbureter was the seat of war, so to speak. I cut off the gasoline at the tank, uncoupled the pipe to the carbureter and unbolted the connection at the intake pipe and took out the carbureter. I got the cork float out and it looked all right, so I replaced it for the test. I stopped up the inlet pipe hole and poured in gasoline until it was level with the spraying nozzle, first fastening the bottom of the carbureter where it was perfectly level. Then I took off the top of the carbureter so I could see the position of the float when the gasoline was at the right height for perfect work, and was not surprised to see the float had got water-logged or soaked with water and oil and dirt, in some way, and hung down so it did not allow the gasoline valve to work properly. It would let in too much gasoline at one time and not enough at another, hence the jerking of the motor when called upon to work and running for a little time alright. I again took out the float and dried it over a stove; then I carefully cut some shellac with wood alcohol and with a fine brush carefully covered the whole of the cork, then allowed it to dry thoroughly before I replaced it. I then took a look at the gauze brass which is to keep out all small particles of dirt and foreign matter, and right here was a help to the real cause of the trouble. A piece of lint about as large as a small pea had got into the gasoline and floated down with it until finally was stopped by the strainer gauze. Here it acted in part as an obstruction to the free regular flow of the gasoline to the spraying nozzle, for the harder the cylinders would suck for the mixture the tighter this little piece of lint would hug up against the brass gauze, greatly hindering the proper amount of gasoline from entering the carbureter.

I washed the carbureter out with boiling hot water and then dried it so as to not have any moisture in it. Then I assembled and replaced in its position, opened the supply tank cock and carefully adjusted the gasoline supply valve to float. I now turned the switch and without priming the motor she started at the first quarter up-pull of the crank, and a purr with the throttle down to almost nothing was my reward. And would it jerk any more? Not a bit.

My friend was so delighted that he wanted me to accept a $10 bill for the job, but as I am not in the repair business I declined, with thanks. He says he now knows more about a carbureter than he ever dreamed of before, and that the advice of being careful to strain all the gasoline through a good chamois skin is being religiously adhered to. After a 6-months' use he says the motor is the easiest one he ever saw to start, hot or cold.—A. D. Carpenter.

PACKARD REAR AXLE GEARS

Towson, Md—Editor Motor Age—What does the 30 bridge of the Packard figure? About 3.2 I think, and it is my understanding that it stands for 30 miles per hour at normal speeds and about 900 revolutions per minute. Is this possible?

A friend has a Packard six runabout and we have repeatedly gotten 70 out of it. The agent insists that it is a 30 bridge. I do not know what the ratio is. The six has not the bridge marked on the cover plates of the differential, but I am inclined nevertheless to believe that this model has a 30 bridge, as it picks up to 70 in ½ mile, and I never saw a more truly high-gear car before. But, if it is true that the motor must turn at 2,100 revolutions per minute, why cannot one get 70 or better from a stripped chassis. I have always believed that a four would turn over faster than a six-cylinder engine. Is this so?—C. Ridgely Emory.

The Packard 30 bridge, is the rear-axle assembly which is geared for 30 miles per hour at an engine speed of 600 revolutions per minute, using a 36-inch wheel, for the 30, and a 37-inch wheel for the six. The gear ratio in this axle is 3.2 to 1. All Packard cars have the bridge model stamped on the back of the housing. In some cases the coat of paint and varnish over this designation is so heavy as to obliterate it, but a little scratching will reveal it.

A 30 bridge on 36-inch wheels will move the car at 70 miles per hour at a motor speed of 1400 revolutions per minute.

On the six-cylinder cars, with 37-inch wheels the gear is 3.7 to 1, and with the 35 bridge, with which the six runabouts are regularly equipped, it is 2½ to 1.

Six-cylinder motors are usually made for slower speeds than fours, because their continuous torque renders them more flexible, and therefore less dependent upon speed for power than those of the four-cylinder type.

BENZINE AS MOTOR FUEL

Hillsboro, O.—Editor Motor Age—Can the form of naptha called benzine be used in a motor car with the same results as gasoline?

2—Would the fuel consumption be greater? If so would benzine at 7 cents a gallon be cheaper than gasoline at 14 cents a gallon?

3—What is the test of gasoline and benzine?

4—Would benzine be more liable to foul the spark plugs and cause carbon to form than gasoline?

5—Does the Schacht Mfg. Co. still use the Buda engine in its 1912 four-cylinder models?—A Subscriber.

1—In experiments conducted by the Standard Oil Co. in Chicago, it was found that with the newer types of carbureters, benzine or naptha may be used in a gasoline motor car engine not with the same results, but with an increase in efficiency over gasoline. This applies of course to actual running. It was further learned, however, that owing to the fact that it is less volatile than gasoline, starting was extremely difficult in cold weather. And that good results could be obtained only from the use of a water-jacketed or otherwise warmed carbureter, and a hot-air intake.

Benzine may be used most advantageously in cold weather, if the motor is started and warmed on gasoline, the heavier fuel being introduced later. This may require some manipulation of the dash control, to allow for the relatively higher combustion efficiency of gasoline, which would probably necessitate a slightly thinner mixture for gasoline than benzine. Experiment, only, can determine this.

2—These tests showed that mile for mile, the fuel consumption is less, using benzine than gasoline. Thus benzine at 7 cents a gallon would be more than 200 per cent cheaper to use than gasoline at 14 cents a gallon in the same engine, if

provided with the proper type of carbureter.

3—Gasoline from the present western crude oils tests from 59 to 60, while benzine from the same source, tests about 57.

4—Benzine is not successful in all types of carbureters. In some it will carbonize, and in others it will not. In the newer types, the Standard Oil tests failed to reveal any increase in carbon deposits, over that resulting from the use of gasoline.

5—The Schacht models continue the use of the Buda motor.

HUDSON MANUFACTURE

Omaha, Nebr.—Editor Motor Age—Please advise whether the Hudson 37 is what is commonly called an assembled car.

2—Was the 1912 model also the 1911 model? If not, to what extent does the Hudson Motor Co. manufacture its own parts?

3—Is not the Hudson model 37 motor identical with the C 4 Continental model?

4—Is the rear axle of the 37 designed and furnished by the Hyatt people?

5—Is the transmission of the 37 made and designed by the Warner Gear Co.?

6—Is the clutch of the 37 designed and made by the National Clutch Co.?—Old Subscriber.

1—The Hudson car, in as far as manufacture is concerned, is an entirely assembled car, although the designs are all made by the company's own staff of engineers, under the supervision of Howard E. Coffin.

2—There were minor changes and refinements embodied in the 1912 Hudson over the 1911 model.

3—The Hudson 37 motor is of original and exclusive design, but is made by the Continental company.

4—The rear axle of this car is of Hudson design, and made by the Detroit Metal Products Co., and uses Bower bearings.

5—The Hudson gearset is designed by the manufacturers, but is not made in the Hudson factory. The identity of the manufacturer cannot be ascertained.

6—The clutch is made by the National Clutch Co., but is of Hudson design.

CEMENTS AND POLISHES

Parkston, S. D.—Editor Motor Age—Please give a formula for a good cement for pipe connections or spark plugs that will withstand high pressure or high heat.

2—Where can I obtain a polish for silvered electric reflectors?—E. G. Meisembolder.

1—A fireproof cement that becomes very hard when heated is prepared by mixing 180 parts of fine iron filings, forty-five parts of lime, and eight parts of common salt, and working the ingredients into a paste with strong vinegar. The cement must be perfectly air dried before heating.

2—Any silver polish, such as may be purchased at drug, department or grocery stores.

How Speedometer Gears Are Figured

Pennsylvania Compels Everyone to Take Out License Before Operating Cars—Plug Cement Formula

CROPSEY, Ill.—Editor Motor Age—What should be the correct number of teeth on the large gear of the Stewart speedometer, the small gear having 16 teeth and being used on 34 by 4 wheel?

2—The speedometer I am using on Model 17 Buick has 16 teeth on the small gear and 64 teeth on the large one. Is this correct?

3—How are these gear wheels figured for furnishing correct number of teeth to be used?

4—I have a friend who has a model 10 Buick and uses 30 by 3½-inch wheels. On his small gear there are 16 teeth and on the large gear there are 60 teeth. On running side by side at 20-mile rate, according to my speedometer, his speedometer registered a little better than 25 miles per hour, which is correct according to the gears and the size of the wheels we are using; or, are we both wrong?—D. E. Crum.

1—68 teeth.

2—No.

3—The proper number of teeth, for corresponding pitch, to the small pinion, which is almost universally of 16 teeth, is found by multiplying the inch diameter of the wheel by two. Hence a 34-inch wheel takes a 68-tooth large gear, a 40-inch wheel, takes an 80-tooth large gear, and a 32-inch wheel takes a 64-tooth large gear.

4—The error in gearing in your speedometer connections accounts for the difference in reading at the same speed between yours and your friend's speedometer. His gearing is correct.

OWNERS MUST HAVE LICENSE

DuBois, Pa. — Editor Motor Age — Is there any case in the courts of Pennsylvania which would reverse the attorney general's conception of the law that everyone must have a license. As I understand the law, a car is licensed and any one may drive it without license, except he be a chauffeur. A chauffeur as I understand is one who receives money for driving.

2—Is there any device on the market which will fit over the nose and mouth for the purpose of filtering the dust from the air? My letter to the Sanitary Shield Co. of Richmond, Va., which address I saw in Motor Age of October, 1911, was returned.

3—So many questions have been asked for the difference in power of a long and short-stroke motors. What I would like to know is the hill-climbing ability of two cars both claiming the same horsepower yet of the long-stroke type and one of the short-stroke type.—W. J. Marlin.

1—According to a recent decision of the Pennsylvania state highway department, in future every person operating a motor vehicle will be compelled to take out a driver's license, regardless of ownership or membership in the owner's family.

2—Such a device is marketed by the Sanitary Sales Co., Box 1774, Bradford, Pa.

3—It is claimed by the advocates of the long-stroke motor that, due to the greater crank leverage and more rapid expansion of the gases during combustion made possible by the greater stroke-bore ratio of the long-stroke motor, greater power is obtained under severe loads than with a square or short-stroke type, although when running under normal conditions no difference in power is apparent in motors of the same displacement at the same piston speed. See Readers' Cleaning House, Motor Age, June 27th.

SOME GARFORD QUESTIONS

Minneapolis, Minn.—Editor Motor Age—What are the four gear ratios and the reverse, also the rear axle gearing on the 1910 model G-7 Studebaker-Garford?

2—What is the highest number of revolutions per minute of the engine under ordinary circumstances?

3—How can I locate the trouble for an excessive amount of gasoline and how can I remedy it?

4—How many miles per gallon of gasoline should a seven-passenger car, loaded, of the above type make?

5—Where can I secure Garford catalog?

6—Where can I obtain a 1912 A. L. A. M. handbook of gasoline motor cars?—A Reader.

1—The Garford G-7 ratios are as follows: First, 1 to 3.41; second, 1 to 1.76; third, 1 to 1—direct drive; fourth, 1 to .86; reverse, 1 to 4.6; rear axle reduction, 3.4 to 1.

2—The normal speed of the motor is from 900 to 1,000 revolutions per minute.

3—Presuming that you mean an over-rich mixture, the remedy is to screw up the high-speed spring-adjusting nut to admit more air. Adjust the low-speed spring until the motor runs properly on low speed.

4—The average gasoline consumption of a G-7 car under normal load is claimed to be from 10 to 11½ miles to the gallon.

5—By writing to the Garford Co., Elyria, Ohio.

6—The Automobile Board of Trade, successors to the A. L. A. M., published a 1912 handbook of gasoline cars, which may be secured by writing to this association, 7 East Forty-second street, New York city.

Manufacturers' Communications

SEE DANGER IN OLDFIELD BILL

WAUPUN, Wis., Aug. 16—Editor Motor Age—Referring to your article on page 18 of your issue of August 15, I feel this Oldfield bill to be more important to the motor car accessory manufacturers than would appear from a perusal of the article, and we believe it would be of value to all who are in the accessory trade or market to make the following public:

Of vital importance to automobile accessory manufacturers, jobbers, and dealers is House bill number 23,417. According to Edward B. Moore, United States Commissioner of Patents, the passage of this measure will deprive any inventor or manufacturer of the right to control the re-sale of a patented article. As the distribution of nearly all the standard accessories is based on a system of price maintenance, it would seem therefore to behoove all interested parties to influence Congress against the passage of the measure. Manufacturers, jobbers, and dealers in other lines have sent their representatives to appear in person at the hearing before the Committee of Patents. They have also written appeals to their congressmen to carefully consider the consequences to their constituents of the passage of a bill of this sort.

It is probable that an attempt will be made to railroad this bill through, by the fact that it is attached to another measure prohibiting manufacturers from buying patents and burying them, making compulsory that they manufacture them within 4 years of the granting of the patent, in such quantities as to supply the demand, or forcing them to permit others to manufacture under the patent.

Thus far all that has been published in favor of the measure has apparently been an endeavor to show that the present law is for the good of no one but the manufacturer, and that its repeal would be of benefit to all others affected. An investigation from an unbiased standpoint will reveal, however, that it would work to the detriment of five classes, whose members make up about 95 per cent of the citizens of the entire country. In fact, it would seem that the only benefit would accrue to the unscrupulous cut-rate concerns and the mail-order houses.

The five classes are: 1 Manufacturers; 2 Jobbers and dealers; 3 Magazines, newspapers, and trade journals; 4 Inventors; 5 Consumers.

A patented article is necessarily a new device, and as such requires a great deal of publicity, before the consumer can become acquainted with its benefits to him, and be able to secure the article for his own use. The manufacturer sets a retail price at which all concerned in its production, distribution and sale, may enjoy a legitimate profit, allowing a sum for advertising, which is essential to its sale. It would be unfair indeed, if, having gone to the expense of creating a demand for the article, cut-rate concerns and mail order houses could sell the same thing greatly below his price, having none of the advertising costs to pay, forcing him to either discontinue manufacture, or operate at a loss, as would be the case where he no longer protected from such unfair competition by law. The legitimate dealer and jobber would also be caught with a stock on hand, that to be moved would have to be sold at little or no profit.

From this it will be seen that national advertising campaigns of any magnitude would be prohibited. Local advertising would likewise lose its stimulous through the dealers' uncertainty of being able to dispose of his stock at his legitimate profit. This would mean the loss of merited revenue to all classes of periodicals.

The present laws are the bulwark which has protected the inventive genius of this country, and furthered its development to such an extent as to place America at the fore in mechanical development. Many geniuses are employed by manufacturing concerns to devote their energies to research. This monetary reward would be impossible were the law proposed to be enacted; and inventors would be forced to other pursuits with incalculable loss to the public.

The consumers would lose in the abandonment of the one price system, that today constitutes the fabric of honest merchandising, and while at times the consumer would be able to buy a patented article at a reduction, there would nevertheless be nothing to prevent a raise in price by a local dealer at any time. The result of such a possibility would be the freezing out of small dealers in large cities, by stringent price-competition, and unfair gains on the part of dealers having a monopoly of territory.

Theorists hold that by permitting a reduction in the retail price of patented goods, benefit is bound to accrue to the consumer. This would work out, however, as all economic questions do, to counteract reductions on goods on which money had been spent to enable the public to secure them, it would be imperative that at least a corresponding increase be made on unpatented, unadvertised goods.

To deprive inventors of their greatest incentive, a suitable monetary reward, would deprive the consumers of the fruits of their endeavor, and would retard mechanical development, placing it on the same unprogressive footing as prior to 1836, when the patent office was established, and which condition was the cause of that institution's establishment. The consumer would be hindered from taking advantage of those inventions that actually were perfected, by the restraint of the advertising systems possible only under private ownership of patents, with the resulting reversion to the slow progress prevalent in the days prior to the establishment of the patent office, when it took years to acquaint the public with the benefits to be derived from a new device. The loss of advertising revenue to the periodicals would necessitate an increase in subscription price, that would be prohibitive to the masses, and would deprive them of the best literature of the day, and the benefits incidental to its perusal, which they are able to secure today at less than the actual cost of production. The number of publications would also be disastrously reduced. It is to be hoped that no interested party will leave a stone unturned to prevent this bill from being railroaded through congress.—Robert B. Dunlap, C. A. Shaler Co.

GETTING MOST OUT OF CAR

Detroit, Mich.—Editor Motor Age—Some people have so long associated the motor car with lavish upkeep expenditures that it requires a distinct mental readjustment to look on motor cars as a source of profit. Our sales records bear witness of the fact that the motor car is an economic investment.

Some months ago, on looking over the list of sales made by our New York office, my curiosity was aroused on finding seven different names signed to one contract. On inquiry, I found the car in question, a seven-passenger touring car, had been purchased jointly by seven men who lived in a Long Island town about 20 miles out and somewhat removed from the railroad. Every morning the car makes its rounds, picks up the seven men and makes a quick, exhilarating run into New York city, dropping each one at his office. All being in the town-town office section, this is quick work. At night the car calls and takes them home, refreshed by their trip. In addition, each family has the use of the car one day a week. The car is stored in a portable garage, and the cost of upkeep to each owner is about $1 a week.

Another Abbott-Detroit owner is a woman in independent circumstances. Her car has been fitted with a detachable bus body and has a route of twenty commuters whom she takes to the train every morning. In the evening she meets the train and motors her clientele home. She also takes a dozen children to and from school daily, and occasionally helps to take out picnics and excursions.—B. C. Spitzley, Abbott Motor Co.

Slipping Disk Clutch

It occasionally happens that a car is brought into the repair shop with a complaint that the clutch slips in starting, takes hold too slowly, etc. When a clutch of the multiple-disk type begins to slip the trouble generally is due to maladjustment, too much oil, or an oil of too heavy a grade. To treat a slipping clutch of this kind one should turn the flywheel over until one of the oil plugs can be removed; pour in about a pint of kerosene oil; replace the plug, then have someone turn the engine over very slowly while the clutch is worked in and out for a few minutes. In this way the kerosene comes in contact with all of the internal mechanism of the clutch, and letting the clutch in and out forces the kerosene in and out between the plates or disks, cleaning away the thick and sticky oil. Some repairmen endeavor to clean the clutch in the above manner, but instead of turning the motor over slowly by hand while the clutch is being worked in and out, they do it while the motor is running, ignoring the fact that as the clutch revolves at speed the oil is held to the circumference of the case and therefore does not flow through the plates or flush through them as it should. This method, however, will meet with fair success if a sufficient quantity of kerosene is used. After the clutch has been thoroughly flushed, drain off the oil and kerosene, flush out if necessary, with a few gunfuls of gasoline, then, refill with the required amount of a mixture of kerosene and cylinder oil.

Glazed Disks Cause Slip

Another prolific cause of clutch slippage is the glazing of the disks. This occurs most frequently with dry-plate types, but the disk-in-oil clutches are not entirely free from this trouble, as in fast running with frequent manipulation of the clutch, the bulk of the oil is forced off of the clutch by centrifugal force, and what remains is rapidly burned by friction, forming a hard impervious glaze of carbon, which greatly impairs the adhesion of the disk surfaces. When this condition obtains, mere flushing out with kerosene will not suffice, for although kerosene will cut the glaze to some extent, it will immediately harden again, if it is not removed.

To accomplish this, after the old lubricant has been thoroughly cleaned out, the motor should be run at moderate speed, and with the gears in mesh, and the hand brake set, the clutch worked in and out, almost stalling the motor at each partial engagement. This will rub the carbon loosened by the kerosene off the disk faces, when centrifugal force will carry it away.

In almost all branches of mechanics, for cleaning up machinery and the hands of workmen, waste is an almost indispensable article; but as extensively as it is used, its proper use is either unknown or ignored in the majority of our motor car repair shops. It does not take the young repairman long to learn that the round paint brush and the can of gasoline are far superior to a bunch of waste for cleaning up a motor; that is, if he is given a chance to try them both. But many are denied these luxuries through a spirit of economy on the part of their employer. A very good brush can be purchased for 35 cents with which, perhaps, all parts of ten or fifteen complete motor cars, including motors, transmissions, rear axles, etc., could be effectively cleaned up, and only a very reasonable amount of gasoline required. For cleaning up the parts of a single car with waste, a pound of waste hardly would be sufficient, at least 1 gallon more of gasoline would be necessary to replace that which is splashed about when waste is used; and at this rate, when it is figured up, to clean up 10 cars, 10 pounds or more of waste would be used, which, at 10 cents a pound would cost about three times the price of a brush; 10 gallons more of gasoline probably would be wasted, which, at 15 cents a gallon would come to more than the cost of four brushes. To say nothing of the time occupied in picking sheds of waste off cotter pins and the like. Another case in which waste is erroneously used, is in wiping up the bearings, connecting rods, pistons, crankshafts and the interiors of crankcases, etc., just prior to their final assembly. Thousands of little fibers of waste adhere to the surfaces of these parts, and later on, when the motor is in action, the oil collects these little fibers and conducts them to some constricted portion of the system where they accumulate until the flow of oil through that duct is stopped to such an extent that a burnt-out bearing is the result. To avoid this practice one of the greatest gas motor factories of Germany supplies each of its mechanics with a pair of cloths about the size of a small face towel. These cloths are collected each week and laundered.

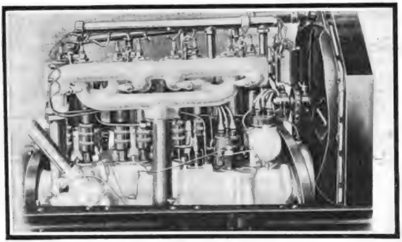
Replacing the Bushings

The removal and replacement of bushing is a job which rarely falls to the lot of the junior repairmen in the best regulated shops. Let us take, for example, the operation of refitting connecting rod bushings. To remove the old bushing, first examine the end of the rod containing it to see if any dowel pins are employed to hold it in place. Next secure a piece of round iron a trifle smaller than the outer diameter of the bushing suitable for driving it out. Then with the jaws of the vise open just enough to give sufficient clearance for the bushing, have some one hold the rod squarely upon its top edges, and with the round iron drift carefully centered on the bushing, give a sharp, light tap to start it. The first blow should be light so that there should be less danger of the drift slipping over a trifle and burring up the edge of the rod. After the bushing is started, there is little danger of this, and heavier blows may be struck with safety. Of course, if a press is available, the bushings can be more easily forced out and into place; and for small connecting-rod bushings the vise may be conveniently used for this purpose.

To position the new bushing, first inspect the end of the rod and see that it is not burred up where it rested on the jaws of the vise, and if a reamer of the proper size is at hand it should be used to test it for roundness. Next, see if the bushing can be started into place. If it can be forced part way in by hand, force it home with a hammer or between the jaws of the vise, using blocks of wood as cushions between both the bushing and the opposite end of the rod. If the bushing is too large, and a smaller one is not at hand, dress it down in a lathe if possible, for great skill is required to do this satisfactorily by hand. Do not ream or scrape out the rod to make the bushing fit, except in cases of injury as mentioned above; the bushing should be fitted into the rod, not the rod onto the bushing. When the bushing is in place, try the pin. It will be a tight fit in the new bushing, and it is proper that it should fit as tightly as it can be pushed in by hand. When in place it may be found that the pin, unless also a new one, will have worn slightly at the bearing sections, and so it will be a loose fit even though the larger part of the pin goes in hard. If excessively tight when in place, it will be liable to run hot, and should be removed and the bushing scraped, or, better still, use a hand reamer, being careful not to make the hole so large as to allow the slightest play. A bushing which fits a pin properly before being fitted into the rod is often found too tight when in place; this is caused by a slight compression of the bushing when driven into place. Therefore, always fit the bushing into the rod first, then the pin into the bushing. If the rod is drilled for oil, see that the bushing is drilled also and that it registers with the oil hole in the rod. Also, see that the bushing is properly secured in this position.

1913 Cadillac Has Increased Power

Lengthened Stroke, Silent Chain Camshaft and Generator Drive, Greater Bearing Area Among the Changes



RIGHT SIDE OF NEW CADILLAC MOTOR SHOWING TWO DELCO DISTRIBUTERS AND

THE single 1913 Cadillac chassis will be similar to the 1912 model, with a few mechanical and constructional differences which make for greater efficiency and comfort for the passengers. The wheelbase has been lengthened from 116 inches to 120 inches, and with this increase of length a few body alterations have been made. In the main, however, the 1913 model will be easily distinguishable, as its outward appearance is still entirely characteristic of the line.

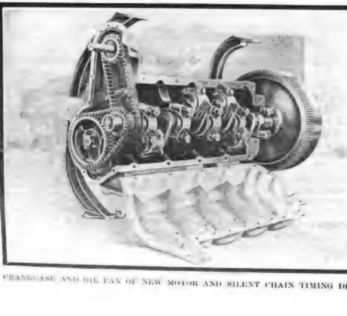
Motor Shows Changes

The most changes are found in the motor, the power of which has been increased. With a stroke-bore ratio of 1.28 due to cylinder dimensions of 4½ inches by 5¾ inches, bore and stroke, respectively, the new engine shows a horsepower increase over this year's motor of from 18 to 25 per cent, depending on the speed. The greatest percentage of increase is brought out at car speeds ranging from 12 to 35 miles an hour. This is due principally to the fact that the stroke has been materially increased over that of former motors, this year's engine having a stroke of 4½ inches. According to the S. A. E. rating, the new motor has a horsepower of 32.4, but this is extremely low since the motor is a long-stroke design. The Cadillac company rates the engine at from 40 to 50 horsepower, which it has developed on the block.

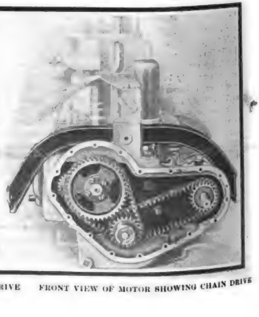
The cylinder construction remains the same, namely, the waterjackets are of copper and are not integrally a part of the cylinder castings. The cylinder heads also retain their former construction, and are removable. The entire cylinder construction is brought out clearly in one of the accompanying illustrations. The heads contain the valve chambers and they are fastened to the cylinders proper by means of nipples which are right and left-hand threaded, as shown in the sectional view. Waterjackets are clamped in position around the cylinders in such a way that any water leak is prevented. This particular cylinder design of individual parts has been a Cadillac feature for a number of years—ever since the company entered the four-cylinder motor car field. The four cylinders are of the L-head type, all the valves being placed on the right. Inlet and exhaust valves are interchangeable and their diameter has been increased from 1¾ inches to 2⅛ inches. Valve stems and springs are inclosed, which aids in the elimination of noise as well as preventing grit and dirt from getting into the bearing surfaces.

Increased Crankshaft Diameter

The crankshaft bearings are still five in number, but the number of mountings of the camshaft has been reduced from five to three. This has been done because the camshaft diameter is increased from ⅝ inch to 1$\frac{1}{16}$ inch, and three bearings are considered sufficient with this greater size.



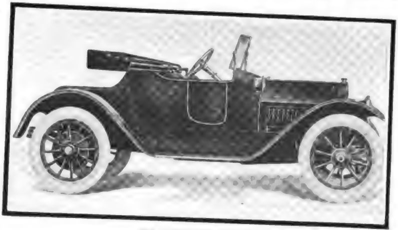
CRANKCASE AND OIL PAN OF NEW MOTOR AND SILENT CHAIN TIMING DRIVE



FRONT VIEW OF MOTOR SHOWING CHAIN DRIVE

Chief Changes Are in the Motor

Improved Delco Electric Starting, Lighting and Ignition System Continued as a Feature for New Season



1913 CADILLAC ROADSTER

The crankshaft and connecting rod bearings have been made larger, their diameter now being 2 inches. All connecting rod lower bearings have been given a length of 2½ inches, while the length of all main bearings except the rear one has been increased to 2⅞ inches. The rear crankshaft bearing now has a length of 4 inches. The enlargement of these various bearings gives larger wearing surfaces and tends to decrease vibration, making the working parts more rigid, and at the same time reducing materially any tendency to whipping stresses in the crankshaft.

Silent Chain Timing Drive

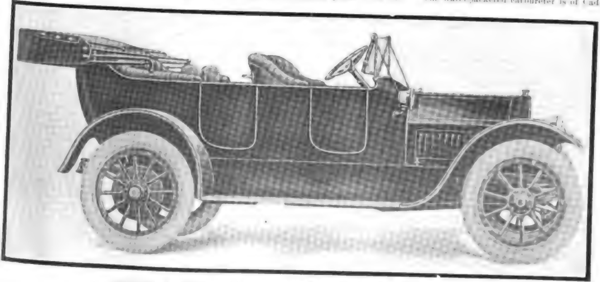
Another change in the 1913 motor is the use of silent chains to drive the camshaft and generator shaft instead of the formerly-used gears. These shafts are still driven from the crankshaft, as shown in the end views of the motor. The chains have a tendency to silence, which feature is the aim of all designers of today. The motor suspension also is peculiar to Cadillac cars. The suspending arms are seen in the motor illustrations. They pass over the top of the crankcase ends, and studs run from them through the upper face of the crankcase.

Cooling of the new motor is unaltered from that of the previous season. There are 147 vertical copper tubes which pass through 145 horizontal copper plates. The vertical tubes are staggered, allowing for free passage of air around them. The cooling water passes through the tubes, and its circulation is assured through the use of a centrifugal water pump located on the left side of the motor and driven from the same shaft as that which drives the motor-generator. The inlet and outlet water manifolds are of copper and of conventional shape. Cooling is assisted by a belt-driven fan, which is placed in the usual location between radiator and cylinders. It is supported by a bracket attached to the motor, and runs on two-point ball bearings. The center distances of the fan pulleys are adjustable.

Cadillac Lubrication

The Cadillac lubrication system is of the splash type, in which the oil receives equal distribution to all motor parts. The oil supply to the various bearings is maintained through the use of a mechanical force-feed lubricator. The oil pan in the lower part of the crankcase is shown clearly in one of the illustrations. It is divided into four compartments, one for each connecting rod end to dip into. The sloping sides of these oil troughs cause the oil to flow from one to another of them, maintaining a constant level in all. The oil finally flows into a reservoir which is integral with the lower part of the motor base. In this reservoir the double-acting force pump is located. It forces the oil up through the sight feed and then to the compartments of the crankcase. Finally the oil reaches the reservoir again and the cycle is complete. For replenishing the reservoir oil supply, there is a filler and breather pipe which leads to the reservoir.

The water-jacketed carbureter is of Cad-



CADILLAC SIX-PASSENGER TOURING CAR SHOWING CLEAN RUNNING BOARD

CONSTRUCTION OF CADILLAC CYLINDER WITH COPPER WATER JACKETS

illac design and has been altered for the new season in that it now has only one adjustment for the air, in addition to the auxiliary air control on the steering column. The gasoline adjustment is now fixed and is regulated before the car leaves the factory. Formerly the carbureter was adjustable for gasoline proportion at the will of the driver. The familiar Delco combination electric system which was installed on Cadillac cars for the first time last season, is continued with a number of minor alterations, which tend to simplify it. The system consists essentially of a motor-generator, storage battery, voltage regulator and gearing between electric motor and flywheel. The motor-generator is placed at the rear left side of the engine, and when operated as a generator is driven by the same shaft as that which drives the water pump. This generator develops electrical energy for igniting the cylinder charges,—when the engine is running normally,—for lighting the lamps, and for charging the storage battery, the energy from which is used to temporarily drive the motor-generator as a motor when the latter is utilized for starting the gasoline engine.

Operation of Starter

To start the engine, the driver closes the starter-switch, thus electrically connecting the storage battery and the temporary electric motor. At the same time he presses down on the clutch pedal, which operation automatically engages teeth of the electric motor gear with those cut on the outer rim of the flywheel. The electric motor then turns the flywheel and crankshaft, until the driver releases the starting switch after the engine has taken up its ordinary running under its own power. The motor-generator then becomes a generator and is in turn driven by the gasoline engine. It generates current to fill the various electrical needs, as already brought out.

Ignition may be accomplished by another system in emergency, which is entirely separate and distinct from the generator system. Two sets of spark plugs are used. The other system is the Delco distributer system, which has a dry-cell current. Since the demand on the storage battery would be too great if it were required to furnish current for ignition at the same time as it is supplying the energy for driving the generator as a motor in starting the engine, this auxiliary dry-cell system supplies the ignition current at the time of starting. After the engine has been cranked, the operator throws off the dry-cell circuit and switches to the generator ignition circuit. This auxiliary ignition system also is of value should anything get out of order with the principal system.

When the motor is idling and the generator is consequently either being driven very slowly or not at all and is not producing sufficient current, that needed for lighting the lamps is furnished by the storage battery, which has a capacity of 130 ampere-hours. When the engine has attained a speed of 280 or more revolutions per minute, the generator current is strong enough for lighting and ignition purposes and it runs directly from the generator to the points of consumption. Any excess current generated is passed automatically to the storage battery, which when fully charged in this way floats on the line and will not receive any more charge.

Changes in Electric System

As to the changes which have been made in the electrical system for next year, these have tended to simplify it. The former controlling switch and ampere-hour meter have been eliminated, for the reason that two windings and two commutators are now used on the armature,—one for use when the unit is a generator and one when a motor,—making it possible to operate either as a motor or a generator unit on a 6-volt current. The battery for 1913 has also been changed, in that it is now of standard vehicle type, having three cells instead of the former twelve-cell design. A voltage regulator has been added which regulates the rate of charge to the storage battery, causing the latter to be charged at a less rate the more nearly it approaches its fully charged condition. The voltage regulator also controls the voltage to the various lamps.

The gearing between the electric motor and the flywheel has been made 25 to 1, instead of the former ratio of 20 to 1. The constructional changes have doubled the cranking speed of the motor and the duration of cranking. The magneto spark has been changed. It is now automatically controlled by ring governor, which makes it unnecessary to give any attention to the spark when driving. Fuses have been placed on all lights to protect them.

Transmission Details

The Cadillac clutch is of the cone type, having the conventional leather facing, and its constructional details are brought out in the illustration. The clutch and its parts are made easily removable. It is provided with a spring ring in the flywheel with which ring the cone engages. This ring is split at eight points of its periphery, making sections, part of each of which is sprung inward. This arrangement provides somewhat of a give to the male member of the cone, and causes the clutch to engage very easily without jerk or bite.

The gearset remains of the three-speed, selective, sliding gear type. All parts consisting of gears, broach, transmission shaft and clutch shaft are of chrome nickel steel, while the unit is provided with annular ball bearings throughout. The drive is by shaft, direct to the differential and rear axle. Two universal joints are provided on the driveshaft. The forward universal is telescopic, while both are inclosed in spherical housings and run in oil. They are fitted with hardened and ground bushings and pins. The forward universal is self-centering. A V-shaped tubular torsion bar passes back to the rear axle housing alongside of the driveshaft in the usual way.

The rear axle is unchanged from the pre-

LEFT SIDE OF 1913 CADILLAC ENGINE SHOWING GEARS FOR SELF-STARTER

vious model. It is of the floating type of Timken construction and runs on Timken bearings. In this floating construction, the entire car weight is borne by the housings and the axle shafts are required to perform the single function of turning the rear wheels. They carry no weight. The differential gears are of carbon steel, while the live axle shafts are of a special alloy steel. The front axle is of I-beam, drop-forged type, and a new feature is the fitting of the front wheel spindles with Timken bearings at the top. All parts of the front axle, such as spring perches, yokes, tie-rod ends, steering spindles and knuckles are drop-forged.

The brakes are of the usual forms of internal expanding emergency and external contracting types. The drums have a diameter of 17 inches and a width of 2½ inches. They are bolted directly to the rear wheel spokes. Wheels are of the artillery wood type, having large hub flanges. They are fitted with demountable rims, and carry 36 by 4½-inch tires, these being larger than those equipped this year, which were 36 by 4 inches.

Spring Suspension

The spring suspension of Cadillac cars is of the three-quarter platform construction in the rear. This makes use of two half-elliptic side springs and one half-elliptic cross spring at the rear of the frame. The front springs are also half-elliptic. The rear side springs have been increased in length from 44 to 48 inches, while the rear cross spring remains 39½ inches in length. The front springs are 36 inches long. All have a width of 2 inches. The frame is of channel section and well braced by cross members. It has a double drop, making a total lowering of 2½ inches. The entire frame is 1 inch lower than that of the 1912 model. This gives ½ inch more action, since the front axle has been dropped 1½ inch. The frame width is 33 inches at the rear, and to allow for a short turning radius it is 3 inches narrower in front.

Right-hand control is retained, the gearshift and brake levers being at the driver's right and within the car. This is a new feature in that formerly the emergency brake lever was outside. This makes it possible to use the right front door. The gears are shifted by moving the lever through the conventional type of H-gate. The control levers are on top of the steering wheel on a fixed quadrant. A hand lever for the adjustment of the carbureter auxiliary air intake is placed underneath the wheel on the steering post. The wheel has a diameter of 18 inches. The steering gear is of the Cadillac worm and worm-gear sector construction, and is adjustable. Ball thrust bearings take the upward thrust from the front axle and wheels when the car is running.

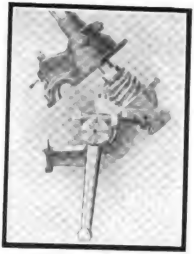
Gear Ratios

The gear ratios are given below for the final drive:

Touring car, six-passenger car, torpedo, coupe, phaeton—3.43 to 1.
Roadster—3.05 to 1.
Limousine—3.66 to 1.

Other ratios are provided at the option of the purchaser.

Seven body styles are fitted to the 1913 chassis. All open bodies have a cowl dash for 1913 instead of the former straight dash. Fenders also are shaped to follow the lines of the wheels, as the body illustrations will show. Foredoors are fitted on all open models, while door handles and hinges are concealed. The lengthening of the wheelbase to 120 inches has given the car a slightly more rangy appearance, although in all its styles the Cadillac is still distinctly a Cadillac.



CADILLAC STEERING GEAR

Latest Alloy Is Stellite

Invention of Elwood Haynes a Rival of Steel in Many Ways

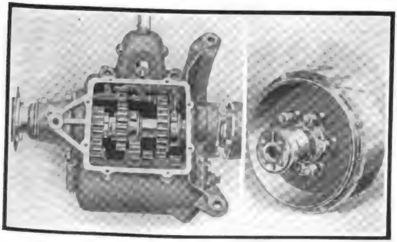
ELWOOD HAYNES, motor car manufacturer of Kokomo, Ind., is introducing a new alloy which is a combination of two uncommon metals. The identity of these is not divulged, but the statement is made that this metal, while it contains neither iron, copper, lead, tin, zinc, nickel, aluminum, nor bismuth, can be made as hard as tempered steel, taking a keen edge, being well adapted for use in razors. It is further claimed that cold chisels made of this material will cut steel nails, ordinary machine steel, etc., with equal facility with steel, and yet, while steel is the only other substance that can do this stellite contains no steel.

The metal is furthermore claimed to take a high polish, which polish is not affected by mild acids, such as found in the juices of fruits. The metal in color stands between silver and steel. It does not oxidize readily, it is claimed, but under heat treatment will become a blue-black. It is asserted that it can be worked readily, although it is harder at working heats than is steel, and can be rolled hot into sheets, or drawn into wire. The alloy is said to be immune to the action of nitric acid, bichloride of mercury, and alkalis. It is slightly affected by hydrochloric acid, and diluted sulphuric acid has a more pronounced effect.

It rings clear, when tested with a hammer, whether cast or forged, and the following physical properties are claimed:

Elastic limit, 85,000 pounds.
Tensile strength, 110,000 pounds.
Elongation, 9 per cent.
Modulous of elasticity, 30,000,000 pounds.

The properties of this peculiar alloy are, according to the claims of Mr. Haynes: The hardness of tempered steel, with the resistance to atmospheric influences of platinum or gold.



CADILLAC GEARSET AND CLUTCH

The Realm of The Commercial Car

Some Phases of Contract Delivery

By William B. Stout

When Motor Delivery Systems Are Perfected Mercantile Houses Will Have Outside Concerns Which Specialize in this Line Do Hauling

WHEN motor delivery systems are perfected, will not all city hauling of goods be done under contract?

With the increased use of expensive motored delivery equipment will not retail delivery at least be taken out of the hands of the merchant and handled by firms which specialize?

Can the ordinary store afford to keep up the new motor truck systems if their delivery work cannot keep the machine busy? Would it not be better for three or four such firms to club together and combine their delivery, syndicating to keep the machine busy and make it a paying investment instead of each of the three or four firms striving to keep up with the added expense of a motored vehicle of their own which their volume of delivery cannot make pay?

The motor truck is destined to revolutionize all road hauling. Just how and what changes will be brought about it is too early to say, and yet there is cause to believe that city delivery at least will finally come into the hands of some firm or firms which shall control all motor vehicles of that city engaged in delivery work. This combination will not be in the nature of a trust or monopoly but a sort of cooperative corporation which, by systems as hard-bound as those on which a railroad is conducted, shall work all motor trucks according to scientific systems and rules evolved and perfected as time goes on, enabling a service and low cost to be attained such as could never be reached by competitive methods by rival stores.

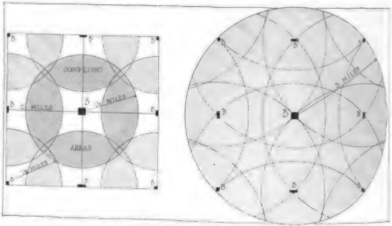
Prices are near standard between one store or business house and another, and at present service counts more than price. It is extra service that draws trade more than low price.

Suppose a merchant, then, were offered a way of giving twice the deliveries per day to his customers that he now accomplishes with little or no more cost to himself, or were told how he could deliver in less time from his store to the buyer. There would be an immediate interest. If he were told that it would mean co-operation with his competitors, however, he probably would dismiss the idea at once.

For this reason in many localities city delivery will have to be developed by separate companies instead of by co-operation among merchants, and handled under contract.

It is easy to analyze the general situation and point out why the eventual delivery in the average city will be of this nature.

Take a grocery situation, for instance, and, looking at Fig. 1, let us assume that the points B are stores located 2 miles apart, a good distance apart, indeed, for groceries in a well-settled community.



SMALL FIRMS NEAR TOGETHER

Fig. 1. Horse System—Stores B 2 miles apart. Delivery radius of each 1 1-2 miles. Area covered by each 6 3-4 miles. Each store competing with neighboring stores in heavy shaded areas

Fig. 2. Motor System—Delivery radius miles. Area covered 28 square miles. Eight stores competing in delivery radius. Sixteen deliver in same territory. Loss to all through duplication of territory

With horse equipment, as in Fig. 1, the radius of delivery will be about 1½ miles each, covering an area of perhaps 6¾ square miles. Each grocery in this case will have a certain territory all its own into which no competition enters. The competing areas where delivery systems repeat in the same territory are shown shaded. But two firms cover the same territory in any case so that the "duplication of territory" is not great.

With the same stores shown in the same locations look at Fig. 2, which shows the effect of the adoption of motor trucks. The radius of delivery is at once doubled—and this is a low figure—giving a radius of action of 3 miles and an area covered by the delivery of close to 28 miles. When the central store B in the figure adopts trucks it at once covers territory in which eight other stores are actually located and invades the delivery territory of eight more. Its immediate advantage is at once seen. It can give service over this area as quick as the horse delivery stores can accomplish with their smaller area, and with fewer flies.

Seeing the advantage, suppose all the other stores adopt motor trucks, which they would have to do or be slowly driven out of business. At once the map looks like

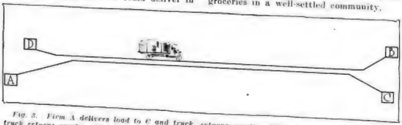


Fig. 3. Firm A delivers load to C and truck returns empty. Firm B delivers load to D and truck returns empty. By combining work A can deliver to C and return with load from B to D, one truck thus doing work of two

PATHFINDER 1500-POUND DELIVERY CAR

each point of the city is visited ten times each day by a delivery vehicle from these stores. A firm combining all the delivery work of a city could accomplish better service and more deliveries per day on possibly half the cost of present systems. One system of delivery would cover the circle area instead of ten, with a consequent saving.

In larger cities where downtown stores deliver to sub-stations and distribute from there, there also is a chance for great saving by this line of work. The motor trucks operating for city department stores operate, as a general thing, for only 3 hours of the day. The rest of the time is wasted on account of delivery schedule. Fig. 5 shows an arrangement similar to that used by these stores.

The central circle represents the loop or business center where four stores are shown. From these, from three to five times a day, run 3-ton to 5-ton motor trucks to leave their loads at the sub-stations. From these sub-stations smaller vehicles, horse or electric, as a rule, deliver in house-to-house work.

Thus the four stores shown have to keep up four expensive sub-stations in each district, twenty-four in all, fitted out with every facility for the quick handling of the load when it comes in, transferring it in the least possible time to the smaller wagons, according to routes, and each station employing five to fifteen men and boys intermittently for this work. These stations are idle except for the 15 or 30 minutes of each delivery period every day.

The drawing shows a city in question divided into seven districts, the central one serving direct from the stores and six outside sub-stations. Each of the four firms has sub-stations in each of these districts, making twenty-four stations in all, and over the whole area of each there are four simultaneous deliveries.

If this work were handled by a separate firm but one station would be needed in each section and eighteen stations, with their expense, could be immediately done away with. Instead of four motors delivering to each territory and crossing and recrossing each other, two or three machines at most could do the work in much less mileage and time, while instead of four deliveries per day six or eight more would be possible. By the elimination of what we have called the duplication of territory, the saving could be put into extra service for the customer at no extra cost to the merchant. Motor trucks now operating but 3 hours a day and losing money could then run 10 to 12 hours a day. True, it would mean a reorganization of all the delivery systems, but the end would justify it.

There is need for a greater concentration of effort in the matter of goods distribution. Horse wastes longer are not necessary. Efficient systems and sound business methods of distribution are at our command. The merchant who has been sleeping contentedly in the conviction that the old methods were good enough for him is awakening to the cold, hard fact that if he doesn't devise some way to give to his customers an increased service such as stores at a distance are giving in his own territory, some morning he will find no business left.

Some men sleep lightly and are awakened by a whisper, others let Big Ben run down without a movement to indicate that they have heard the alarm. It is the early bird that catches the worm. The man who realizes first and takes advantage reaps the reward.

PITTSBURGH TRIES TRUCKS

The new 10-ton truck recently purchased by the city, is now in service. Others are to follow soon, each will displace six teams of horses and as many drivers. Each year the city uses up about $2,000,000 worth of supplies which have to be hauled from the railroad stations. It buys everything from nails to machinery and hay to canned peaches. It is the largest corporation in its end of the state in the foodstuffs markets, as it feeds more than 500 persons at its two poor farms, maintains scores of horses and gives out thousands of dollars worth of goods through its charities department every year. All of this stuff has to be delivered, since Director Oursler has taken to the policy of getting his goods where he can get it at the best rates. Formerly the local dealers who got all the contracts delivered the goods to its destination and for this reason, little hauling was necessary.

ENTERS COMMERCIAL FIELD

The Motor Car Mfg. Co., Indianapolis, Ind., which for a number of years has been devoted solely to the construction of pleasure cars, has announced a departure in the form of a 1,500-pound delivery wagon which will be one of the Pathfinder 40 Series 13 line of cars.

Two Pathfinder 40 trucks were built on order for the A. Keifer Drug Co. and the Charles Mayer Co., both of Indianapolis, Ind. The trucks were in use just a week when a repeat order was received from the A. Keifer Drug Co. for another Pathfinder delivery wagon. The entry of the Pathfinder builders into the commercial field, tried at first merely as an experiment, has thus turned out to be such a success that a large number of commercial cars will be manufactured in 1913.

The Pathfinder delivery wagon is built on the regular pleasure car chassis. The body is graceful, sturdily constructed and receives the same care in finish and workmanship that is devoted to the pleasure bodies. The decision to build the truck on the pleasure car chassis came after exhaustive experiments. It was found that the springs and mechanical features of the Pathfinder chassis are stout enough to carry much more than the 1,500 for which they are intended.

The new delivery car will have a wheelbase of 120 inches. The control is identical with that of the pleasure cars.

TO DO TRUCKING BUSINESS

An independent trucking system using electric vehicles exclusively and competing with the horse-drawn vehicles now in use by the majority of the trucking firms of Boston is the latest recommendation from the special committee of the Electric Vehicle Club of Boston appointed to look after business problems.

The principle object of the contemplated move is the education of the business men in the growth, durability and economical operation of the electric vehicle, although it is believed that the company will be self-supporting and will later on be purchased by private individuals or a corporation when its success has been fully demonstrated. The avowed intention of the committee is to compete actively with teamsters with a view to increasing local sales of electric vehicles among this class of prospective customers as well as among the large corporations doing their own transportation.

In detail, the project that has been laid before the club by a special committee appointed to devise ways and means for promoting the sale of electric commercial

Chicago, and by a number of South Bend business men.

The essential of the plow is a motor car engine mounted on a frame supported and carried by two large wheels with 10-inch tires, the frame carrying beneath it two plowshares. A seat for the driver is placed at the rear end of the frame. From this seat he operates the plow. In front of the wheels is a long guiding arm which runs in the furrow and serves to keep the machine in a straight course.

The engine develops from 40 to 50 horsepower and consumes from 1 to 3 gallons of gasoline per acre according to the contour of the land and the character of the soil. The plow will plow about 8 acres of level land in a 10-hour day and do the work of four men and four teams under similar conditions. It is easily operated by one man.

NEW SCREW-POWER HOIST

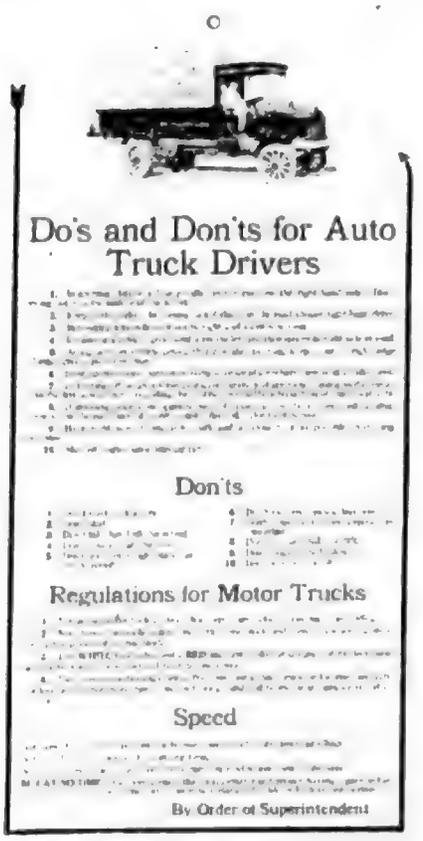
By the use of a new screw-power hoist dumping body designed by the Peerless Motor Car Co. the Southern Fuel and Material Co. of Mobile, Ala., has accomplished with its 5-ton truck the transportation of the unprecedented volume of 150 tons every 24 hours. The truck in a night and a day covers 100 miles.

It is replacing 12 mules. It makes ten trips in a working day over a distance of 5 miles. In the truck body is carried from 5 to 6 tons of gravel and in wagons formerly drawn by mules, which are used as trailers, 25 tons more is handled. Recently the truck has worked night and day, doubling that mileage and tonnage. The performance is in part due to the use of the power dumping body built to meet the problems of coal dealers and contractors, which will unload 5 tons of coal, sand and gravel, or any loose material, in 30 seconds. The truck is backed into position. The lever that unlatches the tail gate is tripped. Another lever turns the power of the truck motor into the dumping mechanism. The front end of the body rises rapidly. In 30 seconds the entire load is off the platform.

Instantly the truck may be started on its return. A touch upon the controlling lever starts the body downward and it can continue to descend while the truck is in motion. When the body reaches its normal position the machanism is automatically disengaged.

A motor train, consisting of a large gas tractor and several trailers built along the lines of a railway flat car, the whole using the public highways as tracks, has been placed in operation at Menominee, Mich., by C. I. Cook. The train makes several trips daily into the neighboring communities to bring fruits and vegetables into the market and provide supplies for the Michigan Canning and Preserve Co. of Menominee.

ule for Truck Drivers



6. Slow up and sound horn at crossing or other place where view is at all obscured.
7. In turning off an intersecting street, make a sharp turn if going to the right; if to the left, a wide turn, rounding the central point in the intersection of the two streets.
8. If stopping place is on opposite side of street, go to the corner, and turning, come up on the right side of the street to point desired. Don't cut across.
9. Have right side of vehicle to the curb and as close to it as possible in coming to a stop.
10. Shut off engine upon leaving car.

DON'TS

1. Don't start with a jerk.
2. Don't skid.
3. Don't take hand off the wheel.
4. Don't take eye off the road.
5. Don't go over rough places at high speed.
6. Don't race on a public highway.
7. Don't leave extra tire exposed to weather.
8. Don't let car smoke or drip.
9. Don't neglect the brakes.
10. Don't stop a jolt.

REGULATIONS FOR MOTOR TRUCKS

1. Not permitted to back up to curb except when actually loading or unloading.
2. Not allowed on boulevard for more than one block, and then only when the stopping place is located in that block.
3. Two white headlights and a red taillight, visible at distance of 200 feet, must be kept burning from sunset to 1 hour before sunrise.
4. Two license-number tags, one at front and one at back must be fastened securely not less than 20 nor more than 48 inches from ground and be visible at distance of 150 feet.

SPEED

Not over 8 to 10 miles per hour in business section of a city, town, or village.

Not over 10 to 12 miles per hour at any time.

Not over 6 miles per hour at corner or curve in road where view is obscured.

But at no time at a speed greater than is reasonable and proper, having regard to the traffic and the use of the way or so as to endanger the life or limb of any person.—By Order of Superintendent.

From the Four Winds

HOW A GASOLINE FIRE LOOKS. ELEVEN TANKS IN PONCA CITY, OKLA., OIL FIELD STRUCK BY LIGHTNING

MINNEAPOLIS Club Tests Gasoline—Attorney G. A. Will, of the Automobile Club of Minneapolis, has complained to the state oil inspection department that some dealers are delivering a lower test gas than motorists are paying for. Samples have been taken from supply houses to investigate the charge.

Could Not Fool the Judge—When some motorists who were arrested in Lynn, Mass., a few days ago, charged with using their muffler cutouts and making a needless racket, pleaded in their defense that it was necessary to open the muffler to get more power going up the slight grade, Judge Avery waited until the cases were finished and then he imposed $5 fines on all the defendants as a method of teaching them that they had gears in their cars, which could be used by the shifting of a lever, if they were not too lazy, and thereby get along without opening the muffler. The judge is a motorist and he could not be fooled.

To Build Concrete Roads—Raising of $3,000,000 by a county bond issue for immediate construction of trunk highways with a concrete base in King county, Wash., is the object of a movement launched by Frank M. Fretwell, secretary of the Automobile Club of Seattle and secretary of the Pacific Highway Association. In advancing the project he has enlisted the interest and support of a great number of prominent business men and heavy property owners of Seattle. Impressed by the wonderful system of public thoroughfares laid out and built at a cost of $3,000,000 by Los Angeles county in California, and the immediate financial benefits that are being derived, Mr. Fretwell, during a recent visit to the south, decided to interview representative citizens of Seattle, with a view of ascertaining the sentiment regarding the plan to bond King county for a like sum.

Milwaukee Treats Orphans—The sixth annual orphans' outing of the Milwaukee Automobile Club was held on August 28, and 400 parentless waifs were entertained with a ride about the park and boulevard system and a picnic in Washington park, the largest in the city. One hundred and seventy cars were provided by members of the club for the transportation of orphans and attendants from five asylums. William H. Pipkorn, originator of the orphans' outing idea in Milwaukee, and manager of the first five outings, was again in charge.

Good Roads War in Alabama—With the rapid increase in the number of owners of motor cars throughout the state the question of good roads has become the livest issue in Alabama politics. The liquor question, which has held first place on the boards so long, is giving way to the new issue. The recent elections developed the fact that it is the wealthier members of the rural communities who are opposing the good roads movement. The small farmer and the mercantile men of the towns and villages have voted for the extra taxes and for the bond issues. The large land owners claim that taxes already are exorbitant and in most districts they have been able to rally a considerable following. The factions are equally divided as to numbers and interesting contests are promised in a number of counties where roads are to be voted upon. Motoring clubs in the cities and larger towns are sending speakers to the counties where a vote is to be taken soon, and are helping in every way possible to carry the election in favor of better highways throughout the state.

Campbell Continues Good Work—Secretary Chester I. Campbell, of the Boston Automobile Dealers' Association, who recently took 3,000 orphan, blind and crippled children on an outing, gave another outing to the inmates of the almshouse and home for aged couples of Wollaston and Quincy, taking about 50 on a trip to Sharon for the day.

Minneapolis Has 5,000 Cars—The city assessor of Minneapolis has listed 4,724 motor cars in 1912, as compared with 3,044 in 1911. The valuations are $2,296,900 and $1,721,655. The value of the additional machines, 1,700 in all, is given at $571,000. This is on a 50 per cent basis. The fourth ward, containing some of the best families, reports 1,848 machines, and the eighth, similarly blessed, reports only 1,017 cars owned.

Sixty-seven in Harvest Moon Tour—The Milwaukee Automobile Club conducted its first annual Harvest Moon tour on Saturday evening, August 24, from its clubhouse at Milwaukee to Oconomowoc, the famous summer resort, and return. Sixty-seven cars participated. The start was at 5 o'clock and dinner was taken at Lalumier hotel on Oconomowoc lake at 7 o'clock. The return trip was begun at 8:30 o'clock and the route was via Waukesha, where a party of 20 cars from the Waukesha Motor Club was picked up and taken to the Milwaukee clubhouse for a buffet luncheon and informal dance.

Prod Up Road-Builders—It has been discovered, through the activities of the Chicago-Milwaukee Good Roads Association, that the Wisconsin state aid law of 1911 contains a section which makes it most simple for a few individuals to compel permanent highway improvement effort in any part of the state. The section means that any group of freeholders resident in any part of Wisconsin may force a township to make an improvement of highways by paying into the town treasury a sum equal to one-sixth of the cost of the proposed work, in no case less than $200, at the same time presenting a petition to the board to do the work. This must be done before August 15 of any year. The board is then required to levy an equal amount and petition the county for the improvement, the county board being obliged to carry out the work. The Wisconsin division of the Chicago-Milwaukee association has

gone through the formula in several townships of Wisconsin, through which the proposed improved highway passes assuring the completion of the road before the middle of next year. The remedy was invoked only when townships refused absolutely to vote improvements of their own accord.

Turns to Street Improvement—Having devoted so much attention to the improvement of roads and highways in the state, and on to Salt Lake City, the good roads committee of the Omaha Commercial Club at a luncheon last week decided to work for the improvement of the boulevards in the city limits. Harry Lawrie was appointed chairman of a subcommittee which will consider plans of operation.

Transcontinental Route Through Tunnel—Kalispell, Mont., is arranging to have the northern transcontinental route laid through that city and Glacier park, not far distant. Part of the way the old road bed of the Great Northern railway will be utilized, and the summit of the mountains will be negotiated through the Haskell tunnel, in which a good road has been laid. The citizens have taken up the question of routing a national reliability run through that section.

Massachusetts Highway Outing—The annual outing of the Massachusetts Highway Association was held a few days ago and there were 221 members on the trip. The run was made in motor cars from Boston to Somerville, Cambridge, Arlington along the Paul Revere route to Lexington park, where a luncheon was served. The return trip was by way of Bedford and Concord, giving a chance to see the maintenance of the state roads.

Moline Plans Hill Climb—A hill climb will be held at Moline, Ill., the morning of Labor day, under auspices of the Davenport Auto Club, whose membership includes Rock Island and Moline automobilists. Eight events are carded, the big race to be the Josephson cup free-for-all. This event is limited to amateur drivers, cars to carry full factory equipment. Entries are limited to members of the Davenport Auto Club.

Will Have Fall Show—Omaha will have a fall motor show, during the Ak-Sar-Ben carnival week, in order that the 1913 models of the cars may be shown to the thousands of outsiders who come to the city during that time, the last week in September and the first in October. It will not be held at the auditorium, where the February shows are given, but will be a street or garage show. The garages will be decorated with the association colors, green and white, some of the dealers having worked out elaborate decoration schemes. The Omaha streets are strung with rows of incandescent lights during the carnival, and these will be extended up along automobile row. All of the companies will have a complete line of the new models on display. It is estimated that the combined auto show and carnival will induce a large per cent of the state dealers to visit the city, as many have signified their intention of doing so, and in addition there will be a large number of prospective buyers. The promise of bumper crops in the state are leading all of the automobile men to predict record sales this fall.

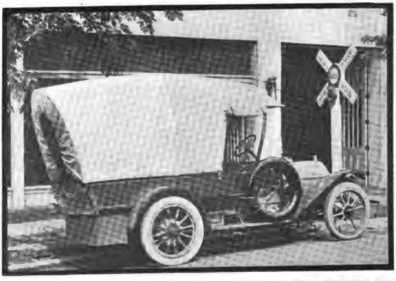
To Tour Meridian Road—Vice-presidents of the Winnipeg-Galveston Meridian road met last week in Brookings and heard reports promising completion of the road within a year. In South Dakota the national colors will be used in the road signs. Telephone poles every 2 miles will be marked with red, white and blue six inch bands. Two poles will be marked at turns. About 60 miles has been marked already with an iron sign, which has been adopted for the purpose. A motor tour will be conducted August 31 along the route from Sioux City to Big Stone lake and will last 3 days. The tour of the Automobile Club of Watertown, S. D., over the connecting road from Minneapolis to the Meridian road at Watertown, has been postponed to September 2.

New Orleans Has Motor Detail—New Orleans motorists are to be given special protection by two special detectives which have been added to the city force. On the other hand, abuses on the part of reckless drivers will be watched more carefully than ever. The two special officers will be charged with no other duty other than that connected with motor cars. They are expected to familiarize themselves as much as is possible with the cars owned in the city, so as to know at sight if the car is being handled by the owner or his chauffeur. Joy riding by chauffeurs and their personal friends unbeknown to the owner of the car will be watched for carefully. Drivers with a reputation for exceeding the speed limit will be kept under surveillance until the infraction of the law is stopped. Special vigilance will be maintained to protect standing cars from thieves and to eliminate so far as is possible overcharges on the part of drivers of taxicabs.

Minnesota Reports Registrations—In the advance sheets of the biennial report of the Minnesota secretary of state attention is called to growth in the registration of cases. At the close of business July 31 the department had issued nearly 26,000 licenses, 4,000 motorcycle numbers and 3,000 chauffeur licenses. The report reads that the ratio of increases will give the state 30,000 motor car registrations in 1912.

Mexican Touring Dangerous—Rebel activities close to towns in the federal district of Mexico and close to the limits of the capital are causing a falling off in motor car touring in this section. Only a few mornings ago the dead bodies of a chauffeur and another occupant of a motor car were found lying upon the highway near a suburban town, and it is supposed they were killed by Zapatistas, as the rebels under Emiliano Zapata are called. It is even considered dangerous to make the trip to and from the country club at night.

Richmond to Have Show—The Richmond Automobile Association, of Richmond, Va., has petitioned the state corporation commission for a charter. The maximum capital of the new corporation will be $50,000 and will be limited to the ownership of ten acres of land. The object of the association is to hold annual automobile shows, the first one being proposed for February of next year.



VELIE TRUCK ACCOMPANYING A KANSAS MOTORCYCLE RUN, WITH COTS FOR 200 TOURISTS

Notice the danger signal in front of this Kansas City garage. This signal is connected with a trap inside the garage. A car coming out crosses the trap and rings a bell as a warning to passing pedestrians

Current Motor Patents

PATENTS ISSUED AUGUST 20, 1912.

1,035,851—Elastic Tire for the Wheels of Vehicles. Frederick Elijah Blaisdell, Hammersmith, England. Filed August 10, 1909. Serial No. 512,172.

1,035,870—Vehicle Tire. John G. Funk, Swissvale Borough, Pa. Filed November 4, 1911. Serial No. 658,474.

1,035,899 — Internal Combustion Engine. John E. Pearson, New York, N. Y., assignor, by mesne assignments, to Pearson Reciprotary Motor Co., a corporation of New York. Filed October 1, 1911. Serial No. 652,864.

1,035,907—Wheel Retaining Means. Thomas G. Rice, Wheeler, N. Y., assignor of one-fourth to William G. Dean and Robert J. Scott, Prattsburg, N. Y. Filed November 24, 1909. Serial No. 529,662.

1,035,911—Resilient Wheel. Max Charles Rose, Cleveland, Ohio, assignor of twelve and one-fourth one hundredths to M. M. Kann and twelve and one-fourth one-hundredths to Sidney Hirsch, Pittsburg, Pa., six and one-eighth one-hundredths to George D. Adams, six and one-eighth one-hundredths to Frank E. Hall, four and one-twelfth one-hundredths to Emanuel S. Weil, four and one-twelfth one-hundredths to David Rosenblum, and four and one-twelfth one-hundredths to Edmund R. Bondy, Cleveland, Ohio, and twelve and one-fourth one-hundredths to Gustave H. Kann and twelve and one-fourth one-hundredths to Fred J. W. Bowery, Pittsburg, Pa. Filed July 19, 1911. Serial No. 639,407.

1,035,912—Wheel. Max C. Rose, Cleveland, Ohio. Filed October 28, 1911. Serial No. 657,218.

1,035,913—Shock Absorber for Vehicles. Charles T. Schoen, Media, Pa. Filed November 6, 1911. Serial No. 658,722.

1,035,937—Carbureter. Lars Anderson, Chicago, Ill. Filed October 15, 1909. Serial No. 522,710.

1,035,938—Air Valve for Carbureters. Lars Anderson, Chicago, Ill. Filed May 21, 1910. Serial No. 562,618.

1,035,943—Spoke Socket. Lawrence Allen Bradford, Flemingsburg, Ky. Filed March 14, 1912. Serial No. 683,793.

1,035,774—Valve Spring Releaser and Retainer. Edwin N. Kraemer, Cedarburg, Wis. Filed May 24, 1911. Serial No. 629,244.

1,036,016—Tire. Ernest Siegel and Jacob Ruppert, Jr., New York, N. Y. Filed November 20, 1911. Serial No. 661,234.

1,036,018—Vehicle Shield. George L. Smith, Washington, D. C. Filed April 27, 1911. Serial No. 623,633.

1,036,020—Tire Holder. Andreas M. Sonnichsen, Milwaukee, Wis., assignor to Auto Parts Manufacturing Co., Milwaukee, Wis., a corporation of Wisconsin. Filed August 31, 1911. Serial No. 646,963.

1,036,023—Automobile Horn. William Edward Stephens, Chicago, Ill., assignor to Aermore Manufacturing Co., Chicago, Ill. Filed July 14, 1911. Serial No. 638,430.

1,036,041—Motor Vehicle. Arthur W. Wall, Birmingham, England. Filed August 7, 1909. Serial No. 511,736.

1,036,043—Fluid Pressure Device. George Westinghouse, Pittsburg, Pa. Filed September 28, 1908. Serial No. 520,039.

1,036,065—Vehicle Tire. Charles W. Blaney, Philadelphia, Pa., assignor of one-half to Clara Blaney, Philadelphia, Pa. Filed February 27, 1911. Serial No. 610,992.

1,036,071—Fluid Pressure Steering Apparatus. Edward E. Bryant, Chicago, Ill. Filed August 5, 1910. Serial No. 575,778.

1,036,085—Inflating Tube Protector. Clarence E. Falor, Akron, Ohio, assignor to the Goodyear Tire and Rubber Co., Akron, Ohio, a corporation of Ohio. Filed October 31, 1911. Serial No. 657,850.

1,036,097—Spring Wheel. Bennie P. Hanson, Elmore, Minn., assignor of one-half to Charles D. Williams, Elmore, Minn. Filed November 17, 1911. Serial No. 660,777.

1,036,115—Switch-Lock for Ignition Circuits. Philip Hoffman and Theodore H. Huffer, St. Louis, Mo. Filed February 23, 1912. Serial No. 679,532.

1,036,119—Power Transmission. Samuel Hughes, Lindsay, Ontario, Canada. Filed May 19, 1910. Serial No. 562,202.

1,036,133—Gas Mixer and Regulator. Garnet Wolesley McKee, Rockford, Ill., assignor to Eclipse Fuel Engineering Co., Rockford, Ill., a corporation of Illinois. Filed December 12, 1910. Serial No. 597,003.

1,036,134—Friction Gearing. James A. McLaughlin, Odum, Ga. Filed February 1, 1912. Serial No. 674,646.

1,036,143—Terminal for Igniters. Ross M. G. Phillips, Minneapolis, Minn., assignor, by mesne assignments, to Henry Deutsch, trustee. Filed February 21, 1911. Serial No. 610,042.

1,036,164—Brace for Vehicle Tops. Joseph Teppert, Buffalo, N. Y. Filed May 5, 1911. Serial No. 625,221.

1,036,186—Automobile Gearing Lock. John H. Bull, Indianapolis, Ind. Filed July 26, 1911. Serial No. 640,691.

1,036,188—Resilient Antifriction for Vehicle Wheels. Courtland G. Capwell, Roslindale, Mass., assignor of thirty-seven one-hundredths to Fred Rawwitzer, South Acton, Mass., and twenty-five one-hundredths to John H. Moore, Boston, Mass. Filed February 2, 1911. Serial No. 606,103.

1,036,213—Explosive Engine Starter. Charles Henry Freeman, Bloomington, Ill. Filed January 27, 1911. Serial No. 605,080. Renewed July 3, 1912. Serial No. 707,610.

1,036,216—Lubricator. Henry Gibbs, Chicago, Ill., assignor to W. D. Allen Manufacturing Co., Chicago, Ill., a corporation. Filed January 10, 1910. Serial No. 537,223.

1,036,247—Vehicle Spring. George M. Huston, New York, N. Y. Filed May 25, 1912. Serial No. 699,654.

1,036,251—Pneumatic Rubber Tire Protector. John F. Johnson, Jamestown, N. Y. Filed March 25, 1912. Serial No. 686,138.

1,036,259—Car Fare Register. James Alexander Keyes, New York, N. Y., assignor, by mesne assignments, to the Columbia Motor Car Co., Hartford, Conn., a corporation of Connecticut. Filed July 7, 1899. Serial No. 723,015.

1,036,288—Gaseous Power Generator. Giuseppe Matricardi, Pallanza, Italy. Filed March 6, 1911. Serial No. 612,720.

1,036,301—Carbureter. Harry A. Miller, Los Angeles, Cal. Filed October 19, 1910. Serial No. 587,985.

1,036,302—Auxiliary Air Attachment. Harry A. Miller, Los Angeles, Cal. Filed November 14, 1910. Serial No. 592,354.

1,036,307—Controlling Device for Motor Vehicles. Frederick P. Nehrbas, Charles Pleuthner and George S. Salzman, Buffalo, N. Y., assignors to E. R. Thomas Motor Company, Buffalo, N. Y., a corporation of New York. Filed December 22, 1906. Serial No. 349,084.

1,036,321—Explosive Engine. Winfield P. Pembroke, Rochester, N. Y. Filed August 12, 1909. Serial No. 512,619.

1,036,334—Pneumatic Power Transmission. Frank Monroe Prather, Los Angeles, Cal. Filed April 12, 1911. Serial No. 620,692.

1,036,337—Radial Pitman for Multiple Cylinder Engines. Charles Benjamin Redrup, Cardiff, England. Filed June 15, 1911. Serial No. 633,333.

1,036,340—Cushioning Device. Albert F. Rockwell and Charles F. Schmelz, Bristol, Conn., assignors to the New Departure Manufacturing Co., Bristol, Conn., a corporation of Connecticut. Filed February 23, 1906. Serial No. 302,652.

1,036,341—Dirigible Headlight. Albert Rossgen, Geneva, Switzerland. Filed October 5, 1911. Serial No. 652,910.

1,036,342—Horn or Whistle. James B. Rogers, Chicago, Ill., assignor of one-half to Carl E. Westcott, Chicago, Ill. Filed November 19, 1906. Serial No. 343,993.

1,036,349—Hose Coupling. Carl C. Schultz, Victor, Iowa. Filed December 16, 1911. Serial No. 666,176.

1,036,356—Distributor for Electric Ignition Gear. Frederick R. Simms, London, England, assignor to the Simms Magneto Co., New York, N. Y., a corporation of New York. Filed January 16, 1911. Serial No. 603,012.

1,036,360—Hand Brake. Charles F. Smith, Bridgeport, Conn. Filed August 23, 1911. Serial No. 645,640.

1,036,396—Three-Wheel Motor Driven Vehicle. William H. Williams, Statesboro, Ga. Filed January 20, 1912. Serial No. 672,421.

1,036,424—Pump Feeding Mechanism for Internal Combustion Engines. Louis Henri Lilert Belem and Gaston Jean-Baptiste Bregeras, Neuilly-sur-Seine, France. Divided and this application filed November 18, 1911. Serial No. 661,131.

1,036,451—Explosive or Internal Combustion Engine. Anthony B. Casper, Kingston, Pa. Filed September 3, 1908. Serial No. 451,569.

1,036,455—Pneumatic Tire. John H. Clune, Springfield, Mass. Filed December 9, 1910. Serial No. 596,433.

1,036,480—Traction Engine. Henry Ford, Detroit, Mich. Filed May 24, 1909. Serial No. 497,869.

1,036,484—Automobile Cooler. Robert L. Glass and Harry S. Walker, Corvallis, Oreg., said Walker assignor to said Glass. Filed December 16, 1910. Serial No. 597,698.

1,036,493—Pneumatic Tire. Barton Berkley Hill, London, England. Filed September 8, 1910. Serial No. 580,564.

1,036,503—Internal Combustion Engine. Herbert McCornack, West Chester, Pa. Filed August 21, 1906. Serial No. 331,514.

1,036,517—Rubber Tire. Jesse J. Beitler, New York, N. Y., assignor to Henry C. Beitler, Chicago, Ill. Filed September 22, 1911. Serial No. 650,754.

AERMORE Exhaust Horn—No. 1,036,023—William Edward Stephens, Chicago, Ill., assignor to Aermore Mfg. Co., Chicago. Filed July 14, 1911, dated Aug. 20, 1912. Relating to improvements in the construction of this horn, about which there has been recent litigation, this patent consists of a resonant group of pipes, dis-

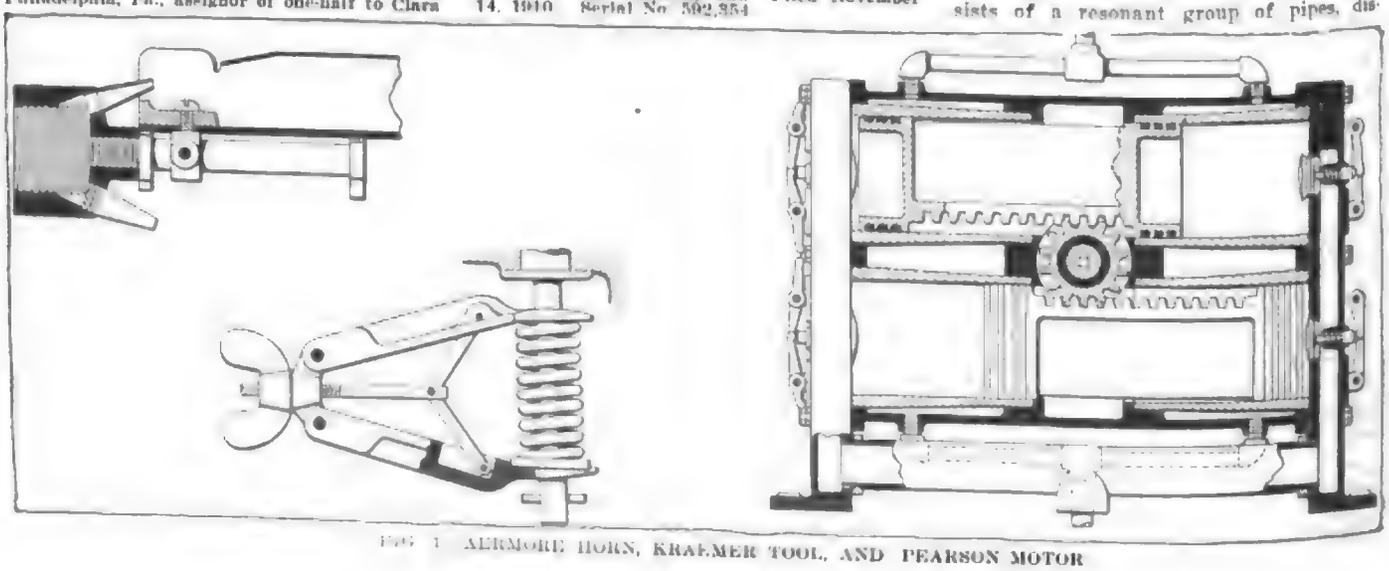


FIG. 1. AERMORE HORN, KRAEMER TOOL, AND PEARSON MOTOR

posed longitudinally about the end of a central nozzle tube, which is provided with four nozzle tips, which discharge the gases into the four pipes, and to a mounting of the component parts of the assembly consisting of a boss, mounted on the central tube, to which each of the pipes are screwed, and of a flange carried by the central tube, which is formed with concave depressions for the reception of the pipes. The action of this signal is by resonance as induced by the injection of columns of exhaust gas projected into the mouths of the pipes by the nozzle group.

Antique Taximeter Drive—No. 1,036,259—James Alexander Keyes, New York, N. Y., assignor, by mesne assignments to the Columbia Motor Car Co., Hartford, Conn. Filed July 7, 1899, dated Aug. 20, 1912. After lying in the patent office for thirteen years, patents have been granted on a driving means for taximeters, whose chief interest is its antiquity.

The purpose of the device is to provide a traction driven distance recorder with a synchronized control whereby it would automatically be thrown into fare registration at the movement of the vehicle, and be thrown out of action, a motor driven time recorder taking its place in the registration of tariff, upon the cessation of the vehicle's motion. Means are also provided for throwing the latter out of operation, for non-productive waits or movements.

Crankless Motor—No. 1,035,899—John R. Pearson, New York, N. Y., assignor, by mesne assignments, to Pearson Reciprocatory Motor Co., New York. Filed Oct. 1, 1911, dated Aug. 20, 1912. The Pearson patent relates to the method of transforming the primary reciprocatory movement induced by the motor impulse into final rotary motion. Comprising a multi-cylinder opposed motor, the opposite cylinders having within them a single, common double-headed piston, the invention consists of racks on the adjoining sides of the pistons, between pairs of which are gear pinions, adapted to be oscillated by their motion, and to impart a differential motion to their respective strokes, thus balancing perfectly, and permitting a very compact construction. The oscillatory motion of the shaft to which the pinion is fixed is transformed into rotary motion, by means of a suitable, unspecified mechanism, the nature of which is not covered by this patent.

Valve Spring Tool—No. 1,035,974—Edwin M. Kraemer, Cedarburg, Wis. Filed May 24, 1911, dated Aug. 20, 1912. This tool is adapted for use either as a spring compressor, expander, or demounter, and may also be used as a valve lifter. It is composed of two jaws pivoted parallel to one another, having bifurcated, or slotted jaws, between which two links are pivoted, in a manner similar to a lazy tong, their joint being connected to a threaded rod, which is acted upon by a thumb screw to expand or contract these toggle levers, thereby closing or opening the jaws of the device.

Ford Gasoline Tractor—No. 1,036,480—Henry Ford, Detroit, Mich. Filed May 24, 1909, dated Aug. 30, 1912. Simplicity is the keynote to this patent, the frame being composed of the motor, motor bed and crankcase, and gear housings. The tractor is of the four-wheel type, driving a pair of rear wheels of relatively large diameter, and steering by a pivotal front axle, supplied with small diameter wheels. The frame is rigidly attached to the rear axle. The motor is horizontally disposed over the forward axle, driving an exterior belt pulley, and carrying its cooling apparatus above it.

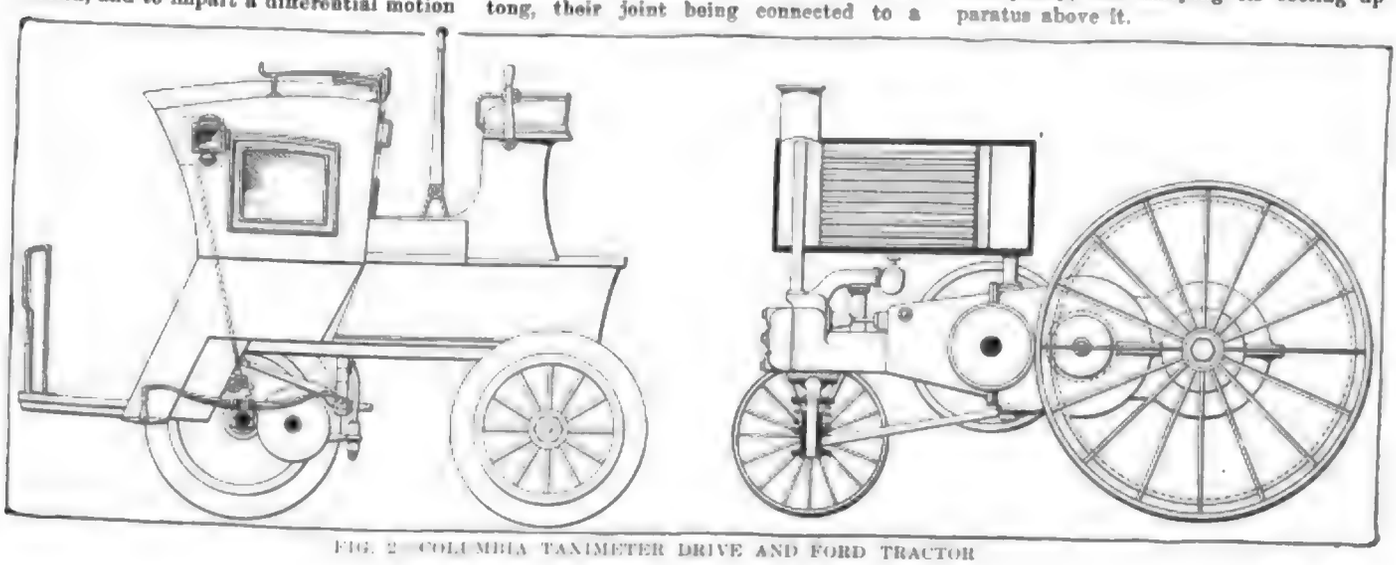


FIG. 2—COLUMBIA TAXIMETER DRIVE AND FORD TRACTOR

The Motorists' Bookman

The Production of Rubber

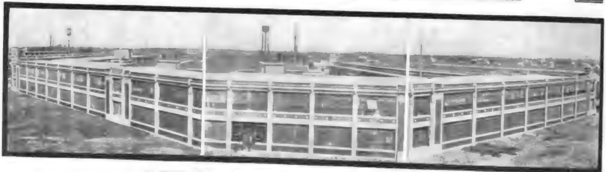
WITH a view to dispelling, to some extent, the appalling ignorance on the part of most laymen, of the methods of production of one of our principal industrial materials, "Rubber," by Edith A. Brown, one of her "Peeps at Industries" series, is published by Adam and Charles Black, London, the MacMillan Co., of New York, being the American agent. This subject is treated in a non-technical way, and for that reason commends itself to those who neither have the time nor the preparation to read a treatise of deeper nature. To make the study of a great industry, affecting every resident of the earth, and which to most people is astonishingly obscure; a subject of interest and profit to the average reader, is surely a laudible mission, and in this example the result has been accomplished in a most entertaining manner.

The industry is treated in an intimate and first-hand manner, the methods of production in Brazil, Peru, Central America, Mexico, Africa, Bolivia, Malaya and India are fully described and illustrated with twenty-four full page photo engravings. Also methods of manufacture are briefly touched upon, and the labor conditions and life in the rubber districts. The book is attractively bound in blue cloth and sells for 37 cents net.

Inter-State Guide

"The Inter-State Automobile Guide" in leaflet form gives a number of routes radiating from the western end of Lake Erie, with either Detroit or Toledo as the axis. It is published in two editions, namely, the Detroit edition and the Toledo edition. The mappings range from Cleveland on the east to Chicago on the west, and from Cincinnati as far north as Grand Rapids. A half a dozen or so route maps are given, together with running directions. It is issued by United Garage Co., Toledo, O., and published by the Lorenz Publishing Co., Detroit, Mich.

Among the Makers and Dealers



FACTORY OF THE CONTINENTAL MOTOR MFG. CO., MUSKEGON, MICH.

FORD Increases Canadian Plant—Additions are being made to the plant of the Ford Motor Co. at Walkerville, Ontario, and when completed this factory will have a floor space of 1,250,000 square feet.

Davidson Goes to Detroit—M. D. Davidson, formerly with the Boston branch of the Oldsmobile and also the R. C. H. sales force in the hub, has gone to Detroit to accept a position as district sales manager with the R. C. H. company.

Foreign Shipment Daily—During 8 days ending August 21 the Clark-Carter Automobile Co. has averaged one foreign shipment of Cutting cars per day, three of these shipments going to Austrlia, three to New Zealand, one to Brazil, and one to Italy.

Ewing Resigns—A change has been effected in the publicity and advertising department of the Nyberg Automobile Works of Anderson, Ind., due to the resignation of Oscar R. Ewing as head of the department. Ewing returns east for the purpose of completing his course in the Harvard law school. The vacancy has been filled by C. A. Lawrence.

Indianapolis Garagemen Organize—An association is being formed by the garage keepers of Indianapolis, which will be distinctive from any of the other motor car associations of the city. Temporary officers are Will Blair, of the Delaware garage, chairman, and Oliver G. Thomas, of the Midway Auto Co., secretary. A permanent organization will be completed in the near future.

New Parts Plant for Indianapolis—A two-story, fire-proof factory building, in which will be manufactured brass and aluminum motor car castings, is being erected in Indianapolis by the Keyless Lock Co. The new plant will occupy a site of one and one half acres at Sheldon street, and the Indianapolis Union railway tracks and will cost about $75,000. It will be daylight plant, with the most modern equipment available. Oil furnaces will be used for melting brass and aluminum and there will be large gas ovens for the baking process. The plant, which will have a capacity of 10,000 pounds of castings daily, will be completed November 1.

Wilson Body Grows—An addition is being made to the plant of the Wilson Body Co. The new structure is to be five stories in height and will contain 65,000 square feet floor space when completed.

Mayer Carbureter to Move—The Mayer Carbureter Co., Buffalo, N. Y., is laying plans to move its factory to Detroit. This company has been represented in this city by Edward Richards, its technical man, and is now about to open a Detroit office in charge of H. Vortcamp.

Firestone Plans Expansion—Plans have been made to increase the capacity of the Firestone Tire and Rubber Co. plant at least 25 per cent. The Firestone company also will build a fireproof employment office to cost $13,000. Another large factory building is te be added to the present group.

New Truck Concern—The Brockway Motor Truck Co., of Cortland, N. Y., capitalized at $100,000, was incorporated at Albany, N. Y., last week. Directors of the new concern are George A. Brockway, Charles S. Pomeroy and Frederick R. Thompson. The new motor company is to make a specialty of light motor commercial vehicles, but 1, 2 and 3-ton trucks will be manufactured as the business increases.

Rush at Bearings Plant—The plant of the New Departure Mfg. Co., at Bristol, Conn., making New Departure ball bearings, is working 127 hours a week in all departments and 152 hours a week in some departments, with day and night shifts of skilled mechanics. Further increased business has been provided for by factory additions now in process of construction. These additions will give nearly 75,000 square feet of floor space, which will be available late in the fall of the present year. Three outside machine building plants and the company's own extensive manufacturing machine shop are busy on special mechanical equipment for the new buildings.

To Manufacture in Wyandotte—The Keeton Motor Car Co. is installing machinery at the Wyandotte plant and will start manufacturing in September and will give deliveries in October. The company has arranged an exhibition for the Toronto exposition.

Concrete Factory for Ware Company—The Ware Motor Vehicle Co. is building a four-story concrete factory at Raymond and University avenues, St. Paul. It is to be 90 by 200 feet and cost $35,000. L. E. Roberts is president and J. L. Ware is general manager. The company is building a four-wheel-drive car.

Continental Trucks on Market—The Continental Motor Truck Co., of Superior, Wis., a new commercial vehicle industry of the northwest, has turned out the first lot of Continental trucks and is now preparing for the regular run. The company is owned principally by E. M. Anderson and Dr. John Barnsdale, of Superior. Dr. Barnsdale built the first motor car to be propelled by a gasoline engine in Wisconsin as far back as 1892. He is the designer of the truck and Mr. Anderson is superintendent of the works.

Marion Names Four Sales Managers—In connection with the active sales department which the Marion Motor Car Co. is now organizing, there have been appointed four district sales managers. These men are C. H. Tyler, who has just resigned as manager of the United States Motor Co.'s Cleveland branch; C. B. Riggs, who gives up the management of the Oldsmobile branch in Kansas City; W. W. McClure, who has been associated with the Marion interests in Texas, and Howard W. Harrington, who has been in charge of the Marion on the Pacific slope. The new district managers will supervise the territory between the Allegheny mountains and the Pacific ocean, and will be under the

direction of F. G. W. Sudrow. They already are at work upon an active campaign in their several districts, and connections are being established in the more important cities as rapidly as possible throughout the territory.

Case Building Service Branch—It is reported that the J. I. Case Threshing Machine Co., of Racine, Wis., will erect a large branch house and service building in Milwaukee before the end of the year. At present Milwaukee business is being carried on through the Madison branch of the Case company in charge of C. M. Doring, with C. R. Kilbourne as city representative.

Goodrich Plans New Building—The B. F. Goodrich Co. has plans for a new office building at Akron, O., to cost $100,000. The new office building will be used by both the Goodrich and the Diamond companies. It has been intimated that a reorganization of the office force will take place soon. It also is said that sweeping changes are to be made in the sales departments.

Morrow Adds to Force—Although there are now 928 skilled mechanics employed in the Elmira, N. Y., plant of the Morrow Mfg. Co., makers of transmission, automatic screw machine parts and ball bearings for the Indianapolis and Toledo, O., Willys-Overland factories, additional men are daily being put to work to keep up with constant demands for materials from those factories for Overland cars.

Ford Makes Record Shipment—What is said to be the largest shipment of motor cars ever made recently left Detroit for Kansas City. In the shipment were 630 complete Ford cars. The most striking feature of this shipment is the fact that the 630 Fords were all packed in twenty-four freight cars. There were two cars of dashes, one car of radiators, six cars of motors, nine cars of frames, one car of wheels, three cars of fenders, one car of tanks and one car containing miscellaneous parts. Every inch of space in the freight cars was utilized in packing the shipment. Had the cars been assembled before shipment, they would have filled 210 freight cars. The value of the shipment was approximately $434,700. The vehicles will be assembled at the Kansas City branch.

Columbus Electrics in Boston—The Columbus Buggy Co., of Columbus, Ohio, has entered into a contract with Tyler Bros., of Boston, Mass., to furnish that concern with 100 Columbus electrics for distribution in New England.

To Build 11,000 Cars—George E. Daniels, vice president and general manager of the Oakland Motor Car Co., of Pontiac, Mich., is authority for the statement that his company will turn out 11,500 cars for 1913. For the coming year a six-cylinder model and a car at $1.075 have been added to the line.

Cutting Plant Nearly Ready—The Clark-Carter Automobile Co., of Jackson, Mich., manufacturer of Cutting motor cars, has practically completed its large and extensive four-story addition to the present plant. The completion of this new building will relieve the present congested condition of the factory and will permit production to be doubled.

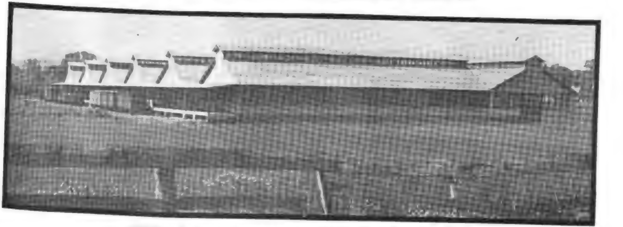
Changes in Packard Staff—Changes have been made in the staff of the Packard Motor Car Co. recently. Russell Huff has been made consulting engineer, J. G. Vincent chief engineer; George R. Bury, manager motor carriage sales department; S. Loomis, manager specifications department; C. R. Norton, manager of truck sales. C. E. Morton will be assistant in the truck sales department.

Timken Adds to Plant—The Timken Roller Bearing Co. is adding to its Canton, Ohio, plant a modern grinding shop, 64x240 feet. Saw tooth roof, steel window sash, side walls, steel frame and solid concrete floors feature the fireproof construction. The new building will be heated by the blower system, all pipes under ground. In the summer time the heating plant will be utilized to circulate cold air through the grinding room. Perfect ventilation is provided for and the factory is flooded with light. New machinery to grind the Timken cups, cones and rolls will be installed on concrete foundations. The building will be ready for occupancy November 1.

New Truck Company Formed—The latest truck concern to be formed in Detroit is the Standard Motor Truck Co., which has just been incorporated for $50,000. Howard Wilcox, who has been connected with the Kelsey Wheel Co., and W. K. Ackerman, assistant manager of the Reliance Motor Truck Co., are the leaders in the new company. The Standard company has secured a factory at 973 Bellevue avenue 35 by 140 feet in size. The truck to be manufactured will be 3 tons capacity and will be a standard, conventional truck in every way. A Continental motor will be used in the new truck.

Jeffrey Dewitt Increases Plant—The Jeffrey-Dewitt Co. has started the construction of a three-story addition to the plant at Butler avenue and the Grand Trunk railroad, Detroit, and also a one-story addition of the saw tooth style of construction. The three-story structure will be 64 by 100 feet in size and the one-story addition will be 52 by 100 feet. These additions will enable the company to triple the output and manufacture 3,000,000 spark plugs this year. The present factory building will be turned into a pottery and the mechanical work will be done in the two new buildings.

Truck Maker Builds Railway Car—The Motor Conveyance Co., of Milwaukee, Wis., manufacturing the B. O. E. commercial vehicle, has just completed a car which is of the size of the ordinary electric street car, but is propelled by a gasoline motor, the power being transmitted to the axles by means of a double friction drive. No trolley or trolley wires are needed, and the car will run on any standard gauge track. One of the first models is now being given exhaustive tests on a New Jersey interurban railway. It has a capacity for thirty-two persons and weighs 42,000 pounds, with a tractive capacity of 200,000 pounds draw-bar pull.



THE NEW FACTORY OF THE PENN MOTOR CAR CO., NEW CASTLE, PA.

Development Briefs

Springless Air-Valve on New Carbureter—Extensive Rear Sight Mirror—Utility Tool—Compact Folding Chairs

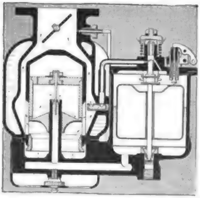


FIG. 1—NEWCOMB CARBURETER

Newcomb Piston Type Carbureter

WITHOUT springs of any description in the air-valve arrangement, the Newcomb carbureter is designed to provide a mixture correct under all operating conditions, with the maximum of flexibility and the minimum of complexity of parts or adjustment. It is made by the Holtzer-Cabot Electric Co., Brookline, Mass. The device uses the usual two-part body, as shown in Fig. 1, consisting of a float chamber and a mixing chamber. The float chamber differs little from standard, having a metal float, and needle supply valve adjustable by means of a thumb-nut at the top of the chamber. This thumb-nut is provided with passages for the admission of the fixed air supply, which is lead into the combustion chamber through a tube and air nozzle. The gasoline is lead from the float-chamber to a vertical standpipe, in the center of the main body, surmounted by a needle-valve nozzle. Air is taken in below and around this stand-pipe, and deflected to the annular mixing chamber by the bottom of the floating piston valve, that constitutes the feature of this carbureter. This piston is vertically disposed within an inverted cylinder, which forms the core of the main body, and acts as a dash-pot to render its movements positive and steady. A small hole is drilled in the piston head, to relieve the compression in this cylinder, which leads to the spray chamber which composes the interior of the piston. The lower portion of the piston slides upon the stand-pipe, and is so formed on its lower surface as to render the passage of air upward from the intake free. Attached to the piston head by an adjusting nut, a needle valve extends downward through the spray chamber to its seat at the top of the gasoline nozzle.

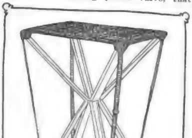


FIG. 2—GRINELL FOLDING CHAIR

In operation, the suction of the engine as the throttle is opened, raises the floating piston, admitting more gasoline into the spray chamber, from whence it is drawn as vapor through openings at the base of the piston, into the mixing chamber. The rising action of the piston, furthermore enlarges the air-inlet area, and raises the vapor outlets in proportion, thus always injecting the vapor above the column of air, ensuring a homogenous mixture, and the minimum of condensation. A collar at the bottom of the combustion chamber, above the gasoline line, is provided for idling adjustment, and when once adjusted for a certain motor, never need be changed.

The carbureter is liberally water-jacketed, and for starting is equipped with a priming plunger and an auxiliary nozzle, located in the throat, which is automatically cut out, when the throttle is opened. Adjustment of the mixture is made entirely from the dash, an indicator on the float chamber cover, showing the adjustment at all times.

Hoco Windshield Mirror

Manufactured by Hoeft & Co., Inc., Chicago, the rear sight mirror shown in Fig 7, is a device, having an oval bevel plate mirror, 6 by 8 inches and an improved extension which permits it to be extended 13¼ inches from center of mirror to center of clamp. It is finished in either brass or nickel, and may be adjusted to any angle. It is furnished with either a clamp or screw-plate.

Convenient Utility Tool

Combining the functions of drill jig, hand vise, clamp for vulcanizing, etc., light jack, valve-lifter, spring-stretcher, or compressor, hand wrench, hand vise, running-board vice, etc., the Utility tool shown in Fig. 4, and manufactured by B. Morgan, at Newport, R. I., is offered. It is light and compact, and yet substantially made, consisting of a foot, to which a square-threaded upright is fixed, on which a nut turns. This nut is placed within a yoke which is part of a movable clamp, which, like the foot, is slotted for use as a wrench. A ratchet lever operates on the nut, and is free to turn in an arc of 240 degrees. The tool is made of steel except the nut, which is of hard brass, and therefore rust-proof. Two sizes are offered to motorists.

FIG. 3—FAVORITE HOOD

Truett Indicator

N. H. Truett, of Toronto, Canada, has invented an indicator, which is shortly to be manufactured by a limited company in Toronto. This device is designed to be applied to both front and rear of the car, in the form of dials, showing the direction next to be taken by the car, and indicating the driver's intention to stop. The dial of this indicator is from 12 to 14 inches in diameter, with warning of the intention of the driver to turn to the right, left, or to stop, painted upon the surface, and indicated at night by means of electric lights of red, green and white. The device is controlled by a foot switch, and is equipped with a miniature indicator on the dash. It is claimed that the

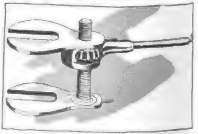


FIG. 4—MORGAN UTILITY TOOL

Novelties for Motoring

Vacuum Cleaning System for Motor Cars—Neat Head-Gear for Fair Motorists—New Exhaust Signal—Hose Union

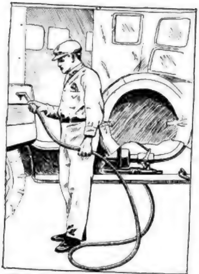


FIG. 5—MOTOR CAR VACUUM CLEANER

operation of the indicator does not interfere with the operation of the car, as its warning is given a minute or so before the actual movement indicated is performed. It is shown in Fig. 6.

Glendale Folding Chair

"Always room for one more" is a maxim that is often applied to the seating capacity of motor cars, but many and varied are the means of accommodating the passenger in excess to the rated seating capacity. The chair shown in Fig 2, which is manufactured by the Glendale Mfg. Co., of New York, offers comfortable accommodation to an extra guest, without taking up too much room when not in requisition. It is constructed on a steel framework and has a heavy duck seat, and while it is amply strong to support 400 pounds, it weighs but 2. It is especially interesting in view of the very small package it makes when folded, being about the size and shape of an ordinary music roll. In folding the canvas seat is removed, when the members of the framework fold into a compact bundle, around which the seat is rolled, being tied by a cord which is attached.

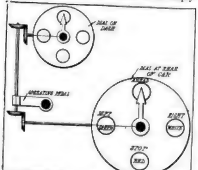


FIG. 6—TRUETT REAR SIGNAL

Motoring Hood

A practical knitted motor hood for women motorists is manufactured by the Favorite Knitting Mills of Cleveland, Ohio. The hood illustrated in Fig. 3 is of fiber silk. These hoods cover the entire head and protect the head from dust and wind. They are durable and warm in cold weather and come in a variety of shades and colors. Other models are in mercerized cotton, wool and silk.

Aermore Exhaust Chime

The Aermore Mfg. Co., of Chicago, has produced the exhaust signal illustrated in Fig. 8. The Aermore exhaust horn consists of a junto of four tubes, which are blown upon through a series of flattened ducts, mounted on a dome-shaped head. This head is attached to a suitable valve, which taps the exhaust pipe. There are no reeds or mechanical appliances and the gases have a straight, free passage through the tubes, and hence will not clog, it is said. The horn is controlled by a pedal on the footboard and the tone may be made loud or low by opening or closing the throttle.

The device is simple and well constructed. The latest models are machine-made, and with the following improvements: A hexagon nut is used on the head, facilitating its attachment; a steel rod is used as an anchor core for the tubes, and an improved manner of anchoring the tubes to the core is used, which consists of two plates to which the tubes are unionized, and through which the core runs for retaining them.

Auto Vacuum Cleaner

Manufactured by the Auto Vacuum Cleaner Co., Milwaukee, Wis., the device illustrated in Fig. 5 is an attachment to the exhaust line of any gasoline motor car that permits the car to be cleaned at small cost and effort, and in a very short time. The device consists of a coupling that is inserted into the exhaust pipe above the muffler in the same way as a cut-out, and which is provided with a valve, which admits the gas to the muffler or ejects it from the device. This ejection is through a suitably designed nozzle, so that behind the nozzle there is a strong suction. An opening at this point is connected to the cleaning hose which is equipped with the customary tools. The dirt and dust is thus blown out through the ejector beneath the car. There are no moving parts to the Auto-Vac, as the device is called, and it occupies but little space. The equipment includes the exhaust pipe attachment, a suitable length of suction hose, and two attachments.

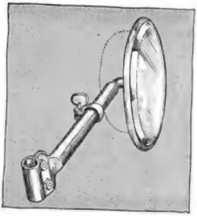


FIG. 7—HOCO REAR-VIEW MIRROR

Safety Hose Connector

To prevent over-inflation, due to the delay occasioned, with the use of the usual hose connection, by the necessity of returning to the stop-cock at the tank, to shut off the air or gas, when using compressed air or tire-gas, the Gleason-Peters Air Pump Co., of Brooklyn, N. Y., offers a neat hose connection that is equipped with a stop-cock that may be instantly shut off at the crucial moment. It is small and compact, and easily attached.

It may be attached to any pump or air bottle, in the usual manner.

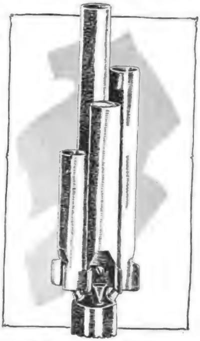


FIG. 8—AERMORE SIGNAL

The Start-Lite Junior

New Automatic Appliance Regulates and Ignites Gas for Headlights with One Lever

OF unusual simplicity, compactness, and neat appearance, the Start-Lite Junior gaslighter for motor cars has just entered the accessory field. This lighter operates on the same principle as the previous Start-Lite lighters, but is constructed on much simpler lines. As shown in Fig. 11, in appearance it resembles a kick-switch, and may be applied in a similar position on the dash. It is shown in

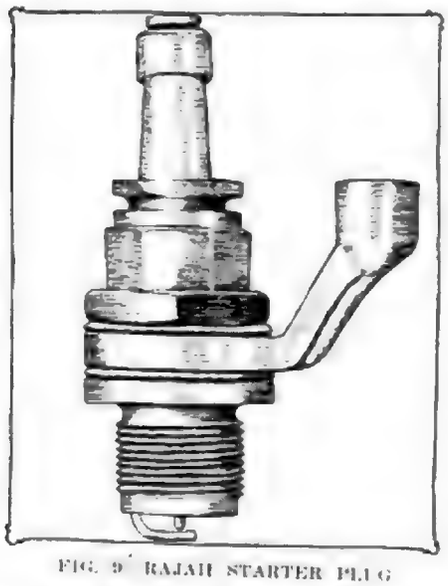


FIG. 9 RAJAH STARTER PLUG

one part of the figure with the cover removed showing the working parts, and a reverse view is shown, with the connections.

The function of this device is to control the admission of gas to the lamps, electrically igniting it when turned on, and cutting out the ignition when the gas is lighted. This is accomplished by means of a single lever, connected to a one-way gas valve and operating at certain positions a spring wedge-switch.

In operation, with the lever in off position, to light the lights, the lever is raised slightly and moved to the extreme right. This turns on the gas and closes the sparking circuit. As soon as the lamps are lit, a touch on the controller handle releases the pin from its engagement with the outer edge of the slot, and permits the lever to spring out, breaking the circuit. The lamps may then be dimmed or extinguished by moving the lever to the left.

Rajah Self-Starting Plug

Originally manufactured expressly for the Prest-O-Lite starter, the Rajah self-starter plug, shown in Fig 9, is now being placed upon the accessory market. This plug has a shoulder at its lower end on which a yoke rests. This yoke is held in place by a jam nut, to make it gas-tight. The yoke is hollow and is provided with a connection to the gas lead. The passages in the yoke lead through a groove in the shell, into the cylinder. The plug otherwise is practically identical with the regular Rajah plug, using the knife-edge bushing and standard porcelain, with an extra long wire. The plug may be removed for cleaning without disturbing the gas connections, or removing the shell from the cylinder. It is furnished in sizes of ½ and ⅞ inches by 18 pitch.

Intake Pressure Pump

As a remedy for the decrease in volume of the indrawn charge of a gasoline engine, proportionate to its speed, which has been recognized as an inherent fault in present motor design, Gardner S. Chapin, of Chicago, has secured patents on a variable pressure pump, in combination with a gas engine, whose purpose is to maintain an approximately uniform volume of the intake at all speeds, by means of increasing the manifold pressure in proportion to the increase in revolutions per minute of the engine.

This device, shown in Fig. 10, consists of a rotary pump, interposed between the carbureter and the intake manifold, which is geared to the engine shaft, and provided with a by-pass for the purpose of cutting it out at low speeds. This by-pass is provided with a throttle, to reduce the flow through it at high speeds. A gov-

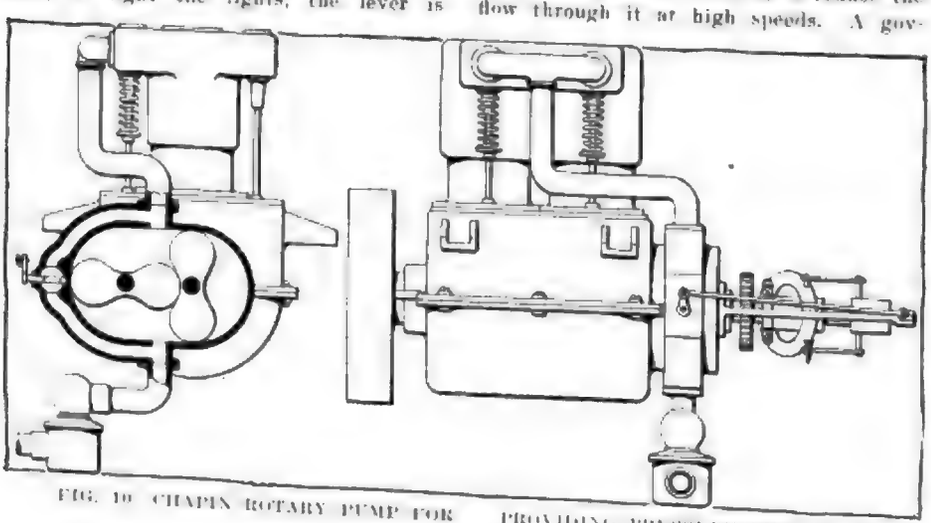


FIG. 10 CHAPIN ROTARY PUMP FOR PROVIDING PRESSURE FUEL INTAKE

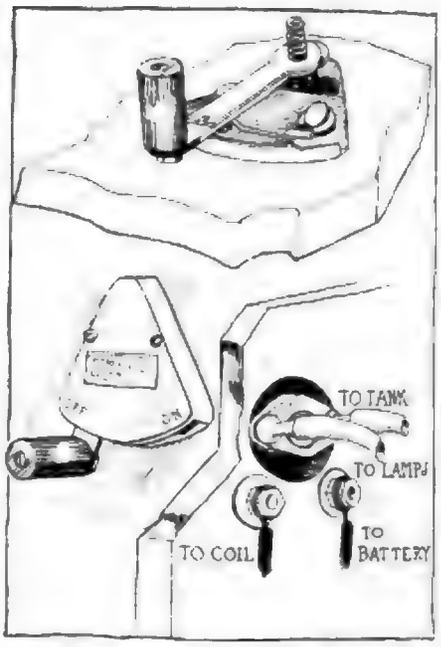


FIG. 11 START-LITE JUNIOR LIGHTER

ernor affixed to the shaft is so linked to this throttle as to close it at high speeds and open it at low.

In operation, the engine is started, drawing in its charge from the manifold in the usual manner, the gas pumped by the pump finding its way back to the pump intake through the by-pass, thus little affecting the pressure in the manifold. As the engine speeds up, however, and the greater speed of opening and closing of the inlet valve admits relatively less charge to the cylinder at a given pressure; the governor actuates the throttle in the by-pass, forcing part of the pressure generated by the pump into the manifold and allowing only a part to escape through the by-pass. As the speed is still further increased, the throttle is closed still more, until eventually it is entirely closed, and the full pressure of the pump is delivered to the manifold, so that the pressure is great enough to force a full charge into the cylinders, even at the highest speeds. On throttling down again, the pressure is reduced by the opening of the by-pass reduced by the opening of the by-pass tically at atmospheric pressure. Theoretically, this device would greatly increase the power of a given size of motor.

Self-Pulling Demontable Wheel

Self-locking and self-pulling, the E C demountable wheel, manufactured by Ellsworth & Cross, Chicago, is so designed that the whole wheel may be removed at the hub, without disturbing the axle bearings, brake drum, drive shaft connections or hub cap. In Fig. 12 is shown a cross section of the wheel as applied to the hub of a floating rear axle. The wheel, like most of its type, has no hub bearings, those parts being secured to the axle, independent of the wheel itself. This member, the true hub, C, is provided with a tapered surface, and flange, to which the brake drum is bolted. The false hub,

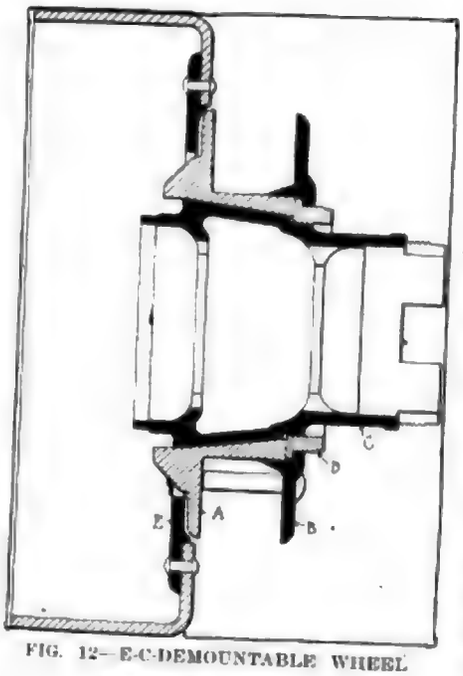


FIG. 12—E-C-DEMOUNTABLE WHEEL

which is secured to the spokes of the wheel, is provided with an inner flange, A, and an outer removable flange B, which fits the wheel hub on a taper. Between this flange and the outer shoulder of the wheel hub is a locking and pulling ring, D, which is threaded to the inner hub, and which, when drawn up secures the wheel hub to the inner hub, and when unscrewed, pulls the wheel from its seat on the taper of the hub. This ring is provided with ratchet teeth on its periphery, in which spring dogs, on the inner hub engage, to prevent the wheel becoming loose from vibration on the road. Two large lugs on the wheel hub flange A, engage with corresponding slots in the hub flange E, to prevent rotation of the wheel on the hub. A special wrench is provided to operate the locking and pulling ring, which automatically releases the dogs on the latter, when the ring is to be removed. Three turns in one direction are sufficient to remove the wheel, and three in the other replace it. The dogs are thrown into action by the wrench in applying the wheel, making it impossible to apply the wheel insecurely.

Puncture-Proof Pneumatic Tire

Applied to the ordinary rim in the usual manner, the Montgomery resilient tire, which is the patented invention of Harry B. Montgomery, of Harrisburg, Pa., is designed to combine the advantages of a pneumatic tire with those of a solid. As may be seen in Fig. 14, the resilient element consists of a single tube, inflated with air, the inner portion of which is provided with a bead for application to the standard wheel-rim of a motor car, and the outer surface in the form of a v-shaped declivity adapted to receive the solid rubber tread. This tread is of such thickness as to preclude the possibility of a puncture, and owing to its diamond shape, the most pressure is exerted at the center of the pneumatic tube, allowing unlimited side-distension. This construction eliminates the danger of rim-cutting, as the inner edge of the tread element would come in contact with the inside of the tube, before the sides touched the edges of the rim. Upon deflation of the tube, the tread is readily removable for replacement or repair, and owing to its form of contact with the tube, is held securely when the tire is inflated.

Compact Headlight Turner

The headlight turner illustrated in Fig. 13 is unusual in its neatness and simplicity. The lamps are mounted on brackets differing little in appearance from the standard stationary type, the upright pillars being pivoted, and secured by springs, so as to permit motion without noise resulting from vibration. The interior structure of this oscillatory support is shown in the cutaway view in the figure. The main standard consists of a casting, bolted rigidly to the frame, within which the movable spindle, which supports the lamp fork, is pivoted. A spiral spring holds the spindle down in contact with a dust-proof bearing at the top of the stationary bracket, bearing against a shoulder on the spindle. Below the spring, which is seated on its lower portion against a strap iron bracket, the spindle shank is squared, and arms are disposed thereon. These arms extend behind the columns, and are connected by a tie rod. To one of the brackets is attached an additional control arm, which is connected by means of another rod to the steering arm, as shown. All working parts, with the exception of these two rods, are concealed, and out of the way. H. D. Peters, of Sioux Falls, S. D., is the inventor.

Fowler Spray Pump

Suitable for washing the car, and adapted to instant requisition in case of fire, a spray pump is manufactured by the Fowler Lamp and Mfg. Co., Chicago, which fits any bucket, and is furnished complete.

Universal Flag Holder

Pennant Sockets for Mud-Guards or Windshields Are Adjusted Without Tools

SUPPLYING an increasing demand for a practical contrivance to hold a flag or pennant for decorative purposes on a motor car, the J. and J. Mfg. Co., of Detroit, Mich., has brought out two styles of flag holders. These may be applied to any part of the car; they may be clamped to the mudguard, running board, windshield or lamp brackets, and will not mar or scratch the finish. No adjustment is required, as they are made in one piece, and are secured by their own spring. They are

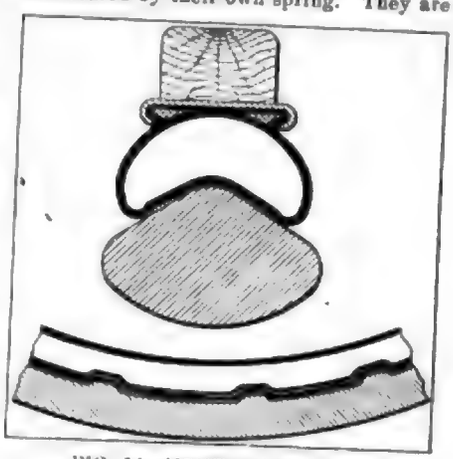


FIG. 14—MONTGOMERY TIRE

made of heavy gauge spring steel, and will hold the largest banner securely in any wind. Vibration cannot effect them, it is claimed, as they have no nuts or screws. Of the two styles, one is adapted to be clamped to the mud guards or running boards, and the other to the windshield or lamp brackets. The former is provided with rubber bearing surfaces and a sliding ring to clamp the flag stick; the latter having two sockets at right angles, which permits the holder to be applied at any angle. They are finished in black enamel.

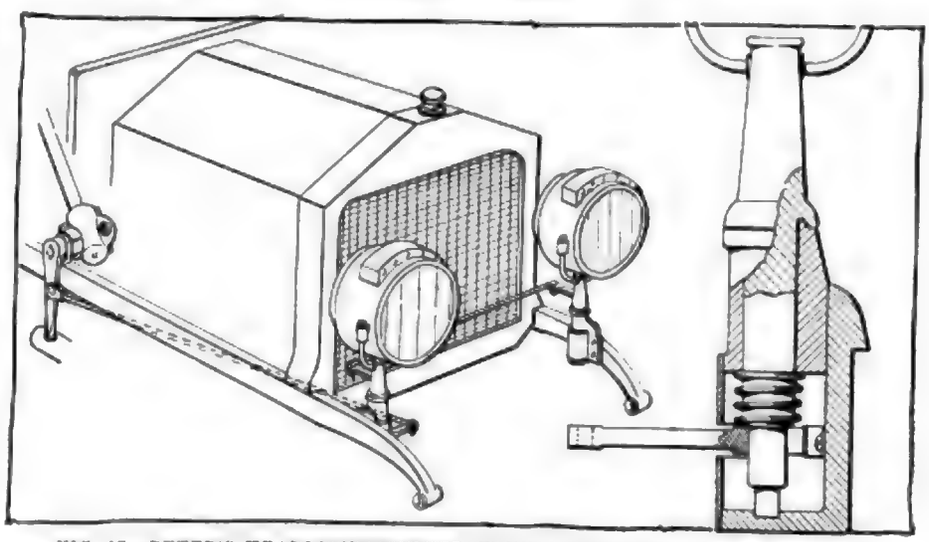


FIG. 13—PETER'S HEADLIGHT TURNER WITH SECTION OF PIVOT CUT AWAY

Brief Business Announcements

Recent Agencies Appointed by Car and Truck Manufacturers

PLEASURE CARS

Town—	Agent	Make
Aberdeen, S. D.	Worthington Auto Co.	R. C. H.
Alliance, O.	C. O. Scranton	R. C. H.
Baltimore, Md.	Colonial Garage Co.	Studebaker
Baltimore, Md.	Chesapeake Garage Co.	Kisselkar
Battle Creek, Mich.	B. C. Kirkland	Kisselkar
Boston, Mass.	Dayton G. True	Krit
Boston, Mass.	Frederick A. Dutton	Abbott-Detroit
Buffalo, N. Y.	L. G. Schoepflin Co.	R. C. H.
Buffalo, N. Y.	Zimmer Motor Vehicle Co.	Henderson
Burlington, Vt.	A. F. Lauzon & Co.	R. C. H.
Calgary, Can.	Lougheed & Webster	Marmon
Chatsworth, Ill.	R. Kloeppel	R. C. H.
Columbus, O.	J. Renner	Richmond
Columbus, O.	O. G. Roberts & Co.	Garford
Davenport, Ia.	Knuppel & Ott	Kisselkar
Davenport, Ia.	Davenport Auto Truck Co.	White
Des Moines, Ia.	Brown-Corley Motors Co.	Everitt
Des Moines, Ia.	Ryan Motors Co.	Marion
Dubuque, Ia.	Lippert-Bishop Auto Co.	Kisselkar
Easton, Pa.	Shannahan & Wrightson Hdw. Co.	Franklin
Jacksonville, Fla.	John G. Geimers	R. C. H.
Kalamazoo, Mich.	W. C. Grace	Kisselkar
Kaufman, Tex.	J. C. Bryant	Kisselkar
La Crosse, Wis.	Fox Brothers	Kisselkar
Lone Tree, Ia.	Zimmerman Steel Co.	Kisselkar
Longview, Tex.	W. D. Sessum	Kisselkar
Los Angeles, Cal.	J. W. Willcox	Henderson
Marshall, Mo.	H. Lowenstein & Co.	Kisselkar
Milwaukee, Wis.	Blenheim Garage	Velie
Minneapolis, Minn.	Eng Olson	Staver
Minneapolis, Minn.	Mercer Motor Sales Co.	Mercer
Minneapolis, Minn.	Minnesota Motor Car Co.	Little
Nashville, Tenn.	Howard Douglas	Kisselkar
Omaha, Neb.	Doty & Hathaway	Reo
Omaha, Neb.	Doty & Hathaway	Little
Omaha, Neb.	Mitchell Motor Co.	Paige-Detroit
Philadelphia, Pa.	Boulevard Garage and Sales Co.	Warren
Portland, Me.	W. M. Chellis	Franklin
Regina, Can.	D. L. Boureau	Kisselkar
Rochester, N. Y.	Ball-Washburne Motor Co.	Kisselkar
Salisbury, Md.	L. D. Collier	Kisselkar
Sedalia, Mo.	W. C. Evans	Kisselkar
South Bend, Ind.	S & C Auto Co.	Haynes
Spokane, Wash.	Spokane Auto Co.	Buick
Spokane, Wash.	Spokane Auto Co.	National
Vancouver, B. C.	Fox Brothers	Dayton
Washington, D. C.	Edward H. Bauer	Kisselkar
Welland, Ont., Can.	A. H. B. Nepp	Ford
West Point, Neb.	Brown Brothers	Kisselkar
Whitestown, Ind.	Clark & Smith	R. C. H.
Wheeling, W. Va.	R. C. Bowman	Marmon
Winnipeg, Can.	Lion Auto Garage	Marmon

TRUCKS

Baltimore, Md.	Walter Scott	Marmon
Columbus, O.	Reliance Truck and Garage Co.	G. M. C.
Davenport, Ia.	Davenport Auto Truck Co.	White
Davenport, Ia.	Davenport Auto Truck Co.	Velie
Minneapolis, Minn.	C. E. Haldeman	Decatur
Philadelphia, Pa.	Boulevard Garage and Sales Co.	Warren

BOSTON, Mass.—The Bi-Motor Equipment Co., of Boston, has added the Knight to its line of accessories.

Minneapolis, Minn.—G. A. Scholtz, Northwestern Bank building, has taken the agency for the Rim-Grip subcasing made in Lincoln, Neb., by the Fisher Mfg. Co.

Albany, N. Y.—The W. N. Whitney & Co. has moved its motor car department to 450 Central avenue, which salesroom and service station was formerly occupied by the United Motor Albany Co.

Indianapolis, Ind.—The Eisemann Magneto Co. has opened a factory sales branch at 514 North Capitol avenue. The branch has a complete repair shop and service station, carrying a full line of parts and supplies.

Baltimore, Md.—Howard L. Crise, who recently entered the motor car supply business, has changed the name of his company to the H. L. Crise Auto Supply Co. and has opened up new quarters at 1916 North Charles street.

Minneapolis, Minn.—F. W. Oliver, former president of the Minnesota State Chauffeurs' Association, and Leo C. Grange, have bought the business, stock and equipment of the Auto Supply Depot, 178 Western avenue, St. Paul.

Buffalo, N. Y.—Announcement is made that Charles P. Monroe has purchased the United Motor Buffalo Co. from the United States Motor Co. Mr. Monroe, who was manager of the company, took over the United Motor Buffalo Co.'s interests and will continue the distributing of the United States Motor Co. products for the northern part of New York and western Pennsylvania.

Akron, O.—The Portage Rubber Co. is doubling its plant capacity at Barberton. Several new buildings are being erected.

Milwaukee, Wis.—F. O. Kraatz, formerly of the A. O. Smith Co., of Milwaukee, has been employed by the Beaver Mfg. Co. to act as outside man for its purchasing department.

Bridgeport, Conn.—The firm of Setzer & Beach has been dissolved. The new organization will be run under the name of Bernard Setzer, continuing to handle the Cole line at 361 Fairfield avenue.

Washington, D. C.—The Goodyear Tire and Rubber Co.'s branch has been removed from 1026 Connecticut avenue to 1016 Fourteenth street, where a three-story brick and stone building has just been erected.

Philadelphia, Pa.—Edward K. Leech, general manager of the Commercial Car Journal, will assume the management of the local branch of the Oakland Motor Car Co. to be established here on September 1, the new branch superseding the Oakland Co. of Pennsylvania, which, for the past 3 years, has handled the Oakland car.

Columbus, O.—Orville W. Lawson, well known in local automobile circles, and more recently in charge of factory sales for the Studebaker Corporation in Texas and Mexico, with headquarters at San Antonio, is now connected with the branch at Columbus, O., the Twyman Motor Car Co., distributors of the Studebaker output in Ohio, West Virginia and part of Kentucky.

Akron, O.—The Swinehart Tire and Rubber Co. has secured A. E. Williams as advertising manager. He was formerly with the Firestone Tire and Rubber Co.

Spokane, Wash.—L. D. Hewitt, who for the past year has been engaged in the motor car business in Walla Walla, has joined the sales force of the Studebaker Corporation in Spokane.

South Bend, Ind.—A new garage will soon be erected on West First street, Mishawaka, to be occupied by Frank Miller. The new structure will be constructed of concrete blocks and will measure 40 by 90 feet.

New York—After September 1 the premises at 18-20 West Sixty-third street will be the New York headquarters for the whole line of Splitdorf ignition devices. Oscar J. Rhode will be in charge of the new Splitdorf headquarters.

Dallas, Tex.—M. C. Manroe, for several years manager for the Alamo Automobile Co. in Dallas, has been transferred to Houston. H. H. Fulkerson, assistant manager for the Alamo company, has accepted a position with the Abrams & Davis Co., representing the Stearns-Knight.

Milwaukee, Wis.—The Mitchell Automobile Co. of Milwaukee has re-opened its service building and sales headquarters at 528-532 Broadway. Two stories have been added and the equipment of the plant doubled, giving the Mitchell one of the finest service stations in the mid-

dle west. N. R. New, formerly of Chicago, is manager at Milwaukee.

Akron, O.—The Miller Rubber Co. is erecting a new building at a cost of $5,000. It will be of steel construction and will be used as a mixing department.

Boston, Mass.—George R. Bascom, who operates a garage at 31 Stanhope street, has gone into the accessory business and he has opened a place at 224 Columbus avenue.

Montpelier, Vt.—A new garage is being constructed at Montpelier for the Pavilion hotel, that is to be 100 by 52 feet and of three stories, making it one of the best garages in the state.

Detroit, Mich.—The Jiffy Auto Curtain Co. has opened a general sales office in Detroit, with headquarters at 527-528 Ford building. The office will be in charge of H. W. Kane and R. H. Baldwin as sales managers.

Syracuse, N. Y.—Hugh H. Goodhart, who for the past 3 years has been connected with the sales department of the Franklin Automobile Co., has resigned to accept a position on the advertising staff of the Lippard-Stewart Motor Car Co., of Buffalo.

Baltimore, Md.—H. S. Block, formerly manager for the local branch of the Stoddard Dayton Auto Co., which has been abandoned here, has opened a garage and salesrooms on Morton street for the Stoddard-Dayton car, for which he is the local representative.

South Bend, Ind.—The Seely Auto Sales and Training School has moved into its new quarters in the Ireland building. The first floor will be a garage and office, while the lecture rooms are on the second floor. H. C. Kingsley has taken charge of the school work.

Minneapolis, Minn.—J. W. Martin has been appointed manager of the Minneapolis branch of the Oakland Motor Co., 1518 Hennepin avenue. The company will establish a service station and carry parts of all models of the Oakland machines in stock for the use of northwestern customers.

Indianapolis, Ind.—J. M. Ward, who for the past 2 years has been connected with the Waverley Co., of Indianapolis, but probably better known as secretary of the Indiana Automobile Manufacturers' Association, has just accepted a position as assistant sales manager of the American Motors Co.

Indianapolis, Ind.—A number of changes are taking place in local motor car circles at the beginning of the 1913 season. One of the most important is the taking over of the salesroom at 427 North Meridian street formerly conducted by the Meridian Auto Co. by the Indianapolis Motor Car Co., which will continue the truck sales room and garage and in its new branch will have the agency for the Flanders electric and Everitt. The Finch-Freeman Automobile Co., upon the closing of the factory sales branch of the Regal, will take over the Regal agency.

Buffalo, N. Y.—C. W. Trautman has been appointed manager of the Buffalo factory branch of the Detroit Electric Co., 120, 1210 Main street.

Indianapolis, Ind.—W. D. Edenburn, formerly with the Remy Electric Co., has become manager of the newspaper advertising department of the Henderson Motor Car Co.

Boston, Mass.—The Perfection Tire Filler Co. has opened salesrooms in the Old South building, Boston, and a manufacturing and installing plant on the Fellsway boulevard, Somerville.

Zanesville, O.—The Mitchell-Zanesville Co. has taken over the Buckeye garage located at 32 Eighth street, and will continue the agency for the Mitchell car. The new company is composed of L. H. Wise and Phillip Basso.

Buffalo, N. Y.—The Willys-Overland Co., of Toledo, O., has purchased property at Main and St. Paul streets for the construction of a three-story fireproof building to be used as a salesroom for the Buffalo branch of that company.

Columbus, O.—The Cummins Auto Sales Co., of North Fourth street, announces its contract to distribute the Elmore in central Ohio expired July 1 and was not renewed. Hereafter the concern will devote its attention to the Krit and Everitt.

Peoria, Ill.—J. Clifford Turpin, a well-known aviator, has retired from aviation and has accepted a position in the sales department of the Bartholomew Co. Mr. Turpin will look after the sales of the Glide cars in territory throughout the west.

Detroit, Mich.—George D. Wilson, sales manager of the Warren Motor Car Co., has resigned to take charge of the sales of the Warren car for several eastern states, with headquarters in New York. Mr. Wilson will be eastern sales manager of the company.

Columbus, O.—Receiver McDowell, of the Columbus Taxi-Cab and Service Co., of Columbus, in a partial report made to the court recently, showed that the concern is making a profit under his management and promises to pay off all of the debts of the company.

San Diego, Cal.—Preparing for increased business, Darrell & Foster, Cole agent, has announced that after the first of the month the salesroom and agency will be located in the modern garage at 1345 First street. The Cole agency will share the garage with the Winton agency.

Wilmington, Del.—The Auto Pilot Lamp Co., of Camden, N. J., has been chartered under the laws of Delaware, with a capital of $25,000, to manufacture, buy, sell and deal in and with all kinds of devices and appliances for motor cars, etc. The incorporators are George H. B. Martin, E. T. Vinnell, of Camden, and C. M. Martin, of Philadelphia, Pa.

Philadelphia, Pa.—The Oakland Motor Car Co., of Pontiac, Mich., will on September 1 establish a branch in Philadelphia, to succeed the Oakland Co. of Pennsylvania, which has handled this car, as an agency for the past three years. The branch will be in charge of Edward K. Leech.

Columbus, O.—Manager Edward F. Adams, of the Columbus Auto Parts and Machine Co., which operates a plant at 575 North Fourth street, Columbus, announces that in the future the concern will confine itself to the manufacture of windshields instead of covering a general line of manufacturing.

Indianapolis, Ind.—Frank P. McLellan has been appointed Indiana representative for the Marvel Carburetor Co., which is moving from Indianapolis to Flint, Mich. Mr. McLellan has established quarters at 315 Susquehannah street, Indianapolis, where he will also be engaged in the motor car repair business with Oscar Wagner.

Minneapolis, Minn.—The Oakland Motor Car Co. is to open at 1518 Hennepin avenue. The garage was formerly occupied by the Kemp Bros. Automobile Co. The Kemps have moved to open their electric station at Hennepin and Bryant avenues. The Oakland company is in the factory branch. The car was represented locally here by an agency heretofore.

Cedarburg, Wis.—The A. J. Meyer Motor Car Co., the incorporation of which was recently noted, will engage at once in the manufacture of the Meyer cushion hub wheel, the invention of August J. Meyer, of Chicago. The wheel is adaptable particularly for commercial cars, although it can be built in a lighter type for pleasure cars.

Columbus, O.—The Central garage is the name of a new concern which has been opened in a remodeled building at 145-149 North Fifth street, with Ira N. Thompson, formerly Columbus agent for the Inter-state, as proprietor and manager. The concern has room for about forty cars. For the present the concern handles the Auburn line of cars.

LaCrosse, Wis.—Joseph E. and August J. Hoffweber of LaCrosse, Wis., are negotiating with capital in several industrial centers of Wisconsin for the financing of a company which has been incorporated under the style of Hoff Motor Car Co., capital $500,000, to manufacture a line of pleasure cars. The Hoff car was designed by the Hoff brothers.

North Yakima, Wash.—The Franklin Sales Co. was recently organized to conduct a general sales business and will have the agency for the Franklin. The officers are: John A. Nichols, Jr., president; George C. Arrowsmith, vice-president; Thomas R. Robinson, secretary and treasurer. The company will have headquarters and salesroom in a new building being

erected on North Third street, which will be ready for occupancy September 1.

Jackson, Mich.—F. S. Rowan has accepted the position of advertising manager of the Clarke-Carter Auto Co., Jackson, Mich., manufacturer of Cutting cars.

Minneapolis, Minn.—The Schornstein Auto Co. will open a new garage at Hudson and Bates avenues, St. Paul. Supplies and accessories will be carried.

Racine, Wis.—William Anderson, of Racine, Wis., has sold the garage and business conducted under the name of the Washington Garage to Klaiber Hansen, formerly manager of the garage of the Horlicks at Racine.

Boston, Mass.—J. E. Wilbur & Co. have opened a garage at 1509 Blue Hill avenue in the Mattapan section of Boston that comprises a two-story structure with a capacity of from sixty-five to seventy cars. E. Horten has been appointed manager.

Charlestown, Mass.—Percy G. Dockham, of Boston, and Thomas Johnson, of Somerville, doing business as the Taylor Mfg. Co., handling supplies at 468 Main street, Charlestown, have made an assignment to W. Hubert Wood for the benefit of their creditors.

Lima, O.—Henry Mack will soon start a large addition to his garage on West Market street, and while the work is being done a large tent will be utilized as a tempopary garage. The remodeling of the building contemplates the erection of two additional stories.

Columbus, O.—The State garage is the name of a new concern which has been opened on East Chapel street for the purpose of doing a general garage business and operating a repair shop. The concern consists of a partnership of H. S. Richwine and H. H. Jones. The concern occupied a building with two stories and containing 20,000 square feet of space. A full line of supplies is being carried.

Dayton, O.—The Mation Automobile Co., of Dayton, O., has filed papers with the secretary of state changing its name to the Majestic Motor Car Co.

Baltimore, Md.—The Marathon Motor Sales Co., which handles the Marathon car in this territory, has opened showrooms at 1117 Hunter alley. The service station will be continued at 10 Morton street.

Washington, D. C.—Edward Wilkie has been appointed manager of the Buick Motor Co.'s branch here, succeeding T. S. Johnston, who resigned to accept the position of southern sales manager for the Republic Motor Co.

Lima, O.—W. H. Moore, who formerly was manager of the sales department of the Gramm Co., has resigned that position to take a similar position with the Gramm-Bernstein Co., which will soon open a plant for the manufacture of trucks here.

Columbus, O.—The Engle & Vincent Automobile Co., recently incorporated with a capital of $15,000, has taken over the garage and sales agency located at 11 Parsons avenue, which was formerly controlled by Charles H. Engle and Frank L. Vincent as a partnership.

Columbus, O.—The Everitt Automobile Co. is the name of a branch which has opened at 307 and 309 Mt. Vernon avenue, Columbus, O., for the distribution of the Everitt cars in Ohio and parts of Indiana, Kentucky and West Virginia. The concern occupies a new garage at that point.

La Crosse, Wis.—The General Motor Car Co. has been organized at La Crosse, Wis., as a corporation with an authorized capital of $10,000 to deal in motor cars and commercial vehicles. Martin W. Rybold, for many years sales manager of the La Crosse Plow Co., northwestern distributor for the Imperial and Dart; Joseph P. Krett, Louis L. Fox and Henry F. Fox are the incorporators.

Akron, O.—The contract for the erection of a one-story brick and concrete office building for the Firestone Tire and Rubber Co., of Akron, has been awarded.

Dallas, Tex.—The name of the Cole representation at Dallas has been changed to the Cole Motor Car Co. Vice-President S. J. Kuqua, of the Cole factory, is in Dallas.

Bretton Woods, N. H.—D. E. Harvey, New England manager for the Hartford Suspension Co., has opened a branch at Bretton Woods for the sale of the various accessories made by that company.

Washington, D. C.—The Potomac Motor Car Co. has leased 1226 Connecticut avenue, N. W., for a term of years, and after extensive improvements will remove from its present quarters at 1218 Connecticut avenue. The company handles the Marmon line.

Atlanta, Ga.—M. Nabors and R. M. Northcutt have acquired the retail sales department for the Cole and Alco pleasure cars and the Alco and Federal trucks. The business will be done under the name of the Cole Motor Car Co. of Georgia, located at 239 Peachtree street.

Minneapolis, Minn.—The United States Tire Co. has opened a new branch in the recently completed building at 1522-1524 Hennepin avenue. The building is two stories and basement, 35 by 120 feet, with capacity to store 12,000 casings. Show rooms and offices will be on the first floor.

Boston, Mass.—The W. L. Russell Co., handler of the Regal in Boston, doing a retail business, has decided to take on the wholesale end also. The retail business will be conducted in the Park square salesrooms with the Haynes and Veerac truck, while the wholesale business will be conducted from the motor mart near by.

Recent Incorporations

Baldwin, L. I.—Acme Auto Rental Co., Inc., capital stock, $5,000; incorporators, G. Wintjen, A. Meiselbach, A. C. Ewing.

Baltimore, Md.—Lyon Motor Car Co., capital stock, $50,000; incorporator, E. B. Lyon.

Boston, Mass.—E. C. Andrews Co., capital stock, $10,000; motor car furnishings; incorporators, E. C. Andrews, H. R. Lynn, W. J. Riggs, Z. A. Hall, S. M. Andrews.

Boston, Mass.—Amberine Lubricants Co., capital stock, $5,000; to deal in lubricating oils, etc.; incorporators, I. I. Slevins, Harry B. Golden, N. Rozen.

Buffalo, N. Y.—Buffalo-Akron Transit Co., capital stock, $2,000; to operate motor bus line; incorporators, W. H. Pensyres, G. Kunz, F. Christiansen.

Cambridge, Mass.—Cambridge Station Garage, Inc., capital stock, $6,000; directors, David J. Murphy, J. J. Guiney, F. W. Roberts.

Chicago—Columbus Monument Garage, capital stock, $2,500; general garage; incorporators, J. T. Crotty, F. C. Taylor, J. J. Poulton.

Chicago—M. R. L. Resilient Tire Co., capital stock, $100,000; to deal in nonpuncturable tires; incorporators, M. R. Labbee, M. O. Lundholm, R. W. More.

Cortland, N. Y.—Brockway Motor Truck Co., capital stock, $100,000; incorporators, George A. Brockway, C. S. Pomeroy, F. R. Thompson.

Detroit, Mich.—Standard Motor Truck Co., capital stock, $50,000.

Dallas, Tex.—Marris-Lingo Motor Co., capital stock, $7,500; incorporators, A. A. Marris, D. C. Lingo, J. W. Fox.

Elizabeth, N. J.—Franklin Auto Co., capital stock, $25,000; general motor car business; incorporators, W. H. Reynolds, M. Gordon, L. Koplan.

Hempstead, N. Y.—Smith's Garage, Inc., capital stock, $2,000; incorporators, Lawrence Schultz, J. Pensook, R. McCombs.

Indianapolis, Ind.—Koogle Automobile Co., capital stock, $10,000; to deal in motor cars; incorporators, I. G. Koogle, C. P. Kline, L. D. Buenting.

Jacksonville, Fla.—Miller Auto Co., capital stock, $10,000; general motor car business; incorporators, F. C. Miller, J. C. Wright, G. L. Haselma.

Kittery, Me.—Non-Heating Lubricating Co. capital stock, $300,000; to deal in lubricating oils, etc.; directors, A. Tutleman, C. E. Smothers, H. Mitchell.

LaCrosse, Wis.—General Motor Car Co., capital stock, $10,000; to deal in motor cars and trucks; incorporators, M. W. Rybold, J. P. Krett, L. L. Fox H. F. Fox.

Lexington, Ky.—Commercial Auto Co., capital stock, $1,500; incorporators, J. N. Gibbons, W. B. Williams, E. N. Williams.

Maplewood, N. J.—Twentieth Century Bearing Co., capital stock, $100,000; incorporators, Menzo Loucks, Van Alstyne Loucks, A. T. Bunzey, G. H. Porter, F. L. Zabriskie.

Newark, N. J.—Sullivan Automobile Co., capital stock, $25,000; incorporators, James Sullivan, C. Hagole W. N. Franzel.

New York—Henderson Eastern Motors Co., capital stock, $20,000; to deal in motor cars; incorporators, H. Harris, E. Knight Harris, L. Friedman.

New York—Ideal Steel Wheel Co., capital stock, $500,000; to manufacture steel wheels for motor cars; incorporators, A. F. Parket, J. E. Strietelmeier, D. E. Kirgan, W. C. Taylor, J. B. O'Donnell.

New York—Reliance Taxicab Co., capital stock, $500; incorporators, N. F. Yeagle, E. Yeagle, K. Lally.

New York—Fox-Heggi Co., capital stock, $6,000; painting and repairing motor cars; incorporators, A. Fox, Otto Hegyi, I. Hegyi.

New York—New York Electric Vehicle Association, capital stock, $50,000; incorporators, G. Tiernan, F. H. Parcells, R. G. Redlefsen.

New York—George Leverne Co., capital stock, $5,000; to deal in motor cars; incorporators, G. Leverne, J. L. Meyer, C. E. Lauten.

Philadelphia, Pa.—McGraw Tire and Rubber Co., capital stock, $100,000; to manufacture motor car tires; incorporator, G. Raymont Collins.

Portland, Me.—Auto Air-Rotar Co., capital stock, $15,000; directors, A. F. Jones, T. L. Croteau, J. E. Manter.

San Antonio, Tex.—Guarantee Motor Car Co., capital stock, $10,000; incorporators, J. F. Hagan, H. J. Smith, C. W. Voss.

Union, N. J.—Clifton Automobile Co., capital stock, $10,000; to manufacture and deal in motor cars; incorporators, B. F. M. Krom, W. A. Schuette, C. Schuette.

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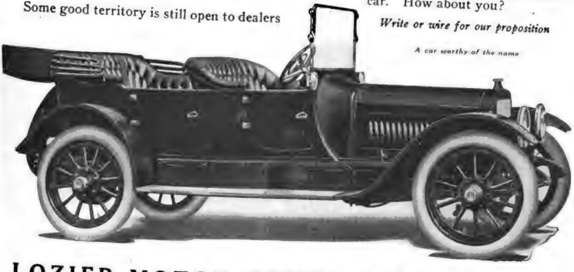
MOTOR AGE

VOLUME XXII CHICAGO, SEPTEMBER 5, 1912 NUMBER 1



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1913
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MOTOR AGE

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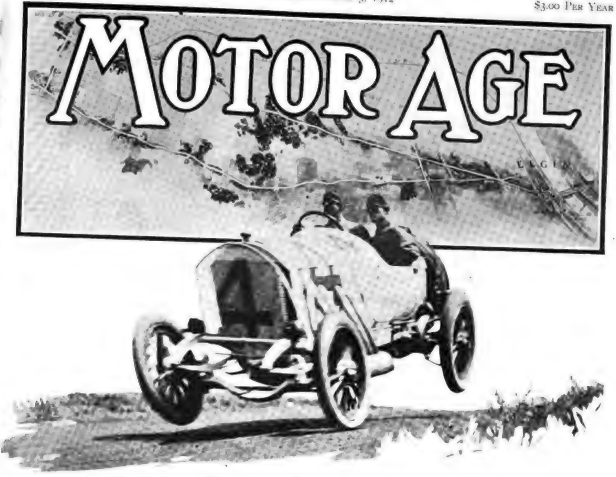


DE PALMA TOPPING ROBINSON'S HILL WITH THREE WHEELS OFF THE GROUND

DePalma Star of the Elgin Road Races

Mercedes Driver Not Only Wins Elgin Trophy Event But Takes Free-For-All As Well—Stutz Wins Illinois Cup, Mercer the Aurora and Mason Small-Car Event

CHICAGO, Sept. 2—Ralph de Palma's luck has changed. After meeting with discouragement after discouragement all through his road racing career in which he always has been an important factor, the Italian-American driver came into his own last Saturday when he scored a double victory in the third annual road race meet at Elgin, conducted this year by the Chicago Automobile Club instead of the Chicago Motor Club, and the Elgin Automobile Road Racing Association. All the races were non-stock. De Palma driving R. J. Schroeder's Mercedes, the same one he had at Indianapolis, won not only the Elgin National Watch Co. trophy race for cars under 600 inches, but he continued his victorious pace and annexed the free-for-all as well at 68.9 miles per hour. In the Elgin he did 68.4 miles per hour. The previous course record was 66.45 miles per hour, made by Zengel.

The meet was a great and glorious success and reflects great credit on the Chicago Automobile Club, which took hold of the affair after it had been dropped by the Chicago Motor Club and in 7 weeks' time organized the meet and secured a field of starters that for brilliancy never before has been equaled at Elgin. In all five races were run, one more than in previous years. De Palma won both on the second day, while the three curtain-raising races on Friday, when the smaller events were run off, were taken by the Mason, Mercer and Stutz. The Mason won the Fred W. Jencks trophy for cars 230 inches and under at an average pace

Results of Elgin Races

Pos. Car and driver	M. P. H.
FREE-FOR-ALL	
1—Mercedes, de Palma	68.9
2—Benz, Bergdoll	67.5
3—Knox six, Mulford	66.6
ELGIN TROPHY	
1—Mercedes, de Palma	68.4
2—Knox six, Mulford	67.4
3—Stutz, Merz	64.2
4—Mason, Roberts	63.8
5—Stutz, Anderson	63.3
ILLINOIS TROPHY	
1—Stutz, Merz	66.11
2—Stutz, Anderson	65.6
AURORA TROPHY	
1—Mercer, Hughes	65.0
2—Mercer, Pullen	62.3
3—Falcar, Trussel	54.08
4—Mason, Roberts	51.4
5—Falcar, Hastings	49.9
JENCKS TROPHY	
1—Mason, Endicott	60.57

RALPH DE PALMA, DOUBLE WINNER AT ELGIN

of 60.5 miles per hour; the Mercer driven by Hughes, repeated last year's performance by taking the 231-300 class in which the Aurora trophy was the consideration instead of the Kane County cup, at a pace of 65 miles per hour; while the Illinois cup, won last year and the year before by the National, went to Merz in the Stutz at 66.11 miles per hour.

Warm Contests on Second Day

While the races the first day were not productive of close finishes, the second session more than made up for this, for it was a see-saw all the way in the Elgin trophy race between de Palma in the Mercedes and Mulford in the Knox, while the two of them were battling with Bergdoll in the Benz in the free-for-all, which kept the interest of the spectators at fever heat all through the 305-mile grind. The first day the little Mason driven by Endicott practically had a walkover in the Jencks cup event, for the Herreshoff went out early with a broken wheel, while the little Ford also quit early. In the Aurora the Mason and Falcars promised competition for the three Mercers, but Hughes always had the race at his mercy. One of the Falcars slid into third money, while the other one was among the finishers. In the Illinois the Rayfield went in crippled before the start by a burnt-out bearing. The National looked a contender and would have put up a warm argument had not a break in the magneto coupling elminated it.

The free-for-all was a remarkable battle in which the star of Bergdoll was in the ascendancy for the most of the distance. The Quaker drove like a demon and it looked as if he would pull down the big end of the purse. He led for the first twenty-two laps, then gave way to de Palma, who led for two rounds, only to yield to Bergdoll's speed. The Benz kept in front to the thirty-fifth lap, when de Palma's persistency, coupled with tire trouble that stopped the Benz, put the Mercedes in front again, which position it held to the end. Mulford in the Knox never was worse than third and in the twenty-sixth and again in the twenty-eighth he was second. In the Elgin trophy race it always was de Palma and Mulford, with the Mercedes driver getting to the front in the fourteenth.

Why de Palma Won

De Palma's victory may be credited up to his careful inspection of his car. Friday in his garage he went over the Mercedes with a drop light and discovered at 4 p. m. that his clutch case was cracked. It was 2 o'clock Saturday morning before he had made the repair and even when he got to the tape he was obliged to do more work. It fact, it was necessary to delay the start of the race 15 minutes in order to give de Palma a chance to get ready. Then the Italian went ahead and won. For the first ten laps his clutch was slipping, then it froze and from that point on de Palma never was able to disengage it. When he stopped at the pits for carbureter trouble he was obliged to kill his motor. Upon starting again he had to watch his chance to go into first, trusting to not stripping his gears and allowing for his rear wheels to slip in the oil. Had he had to make a stop away from the pits, unless he had been favored by a grade, he would have been put out of the race.

ERWIN BERGDOLL IN BENZ, SECOND IN FREE-FOR-ALL AT ELGIN

SCENE AT THE TAPE BEFORE THE START THE FIRST DAY

There was very little excitement at the pits. Little mechanical trouble developed and there were only twenty-five changes of tires on both days. De Palma changed three casings in his races. The work of the pit men was poor and considerable time was lost in making tire changes. The jacks used looked ridiculously small and slow and the Mercer seemed to get the best results.

Twenty-eight Cars Start

There were thirty-two entries actually on the books on Friday morning. Of this number twenty-eight started in the five races. The free-for-all had six starters and three finishers; the Elgin had nine starters and three finishers; the Illinois four and two; the Aurora six and five and the Jencks three and one. The scratches were the two Falcars, the National and the big Fiat, all on the second day. The Falcars and National were put out by the first day's racing, while the big Fiat developed differential trouble going to the tape the second day. A deal had been made which had shifted Tetzlaff from the smaller car, Eddie Hearne taking his place. When the big car went out of commission this left Tetzlaff without a mount and he was forced to sit in the pit. It was thought he might relieve Hearne, who was suffering from a weak wrist but Tetzlaff's contract with the Miller tire people would not permit him to drive Hearne's car which was shod with Michelins.

Big Crowd Out Saturday

As for the attendance, there was a larger crowd on the second day than turned out a year ago, it being estimated that 50,000 lined the course. The first day's crowd was smaller than last year.

RALPH MULFORD IN KNOX SIX, FIRST TO START ON SATURDAY

How Saturday's Races Were Decided

Details of the Struggle in Two Great Road Classics

MERZ IN STUTZ, WINNER OF ILLINOIS CUP

H. ENDICOTT IN MASON, WINNER OF JENCKS TROPHY

THE feature races of the Elgin meet were those run on Saturday, which were for the Elgin National Watch Co. trophy and the free-for-all. They were the most sensational ever seen by the Elgin race goers. While there were fifteen entries, only ten cars lined up for the long grind of 254 miles in the Elgin race and 305 miles in the free-for-all, which event was added this year. The two races were run simultaneously, several of the cars competing in both. The Benz entry, which was driven by Bergdoll, Philadelphia's millionaire racing driver, not being eligible in the Elgin race for the reason that its piston displacement was over 600 cubic inches.

Mulford Popular with Crowd

It was easily seen that the crowd liked Mulford. After a delay of 15 minutes, while the pitmen tinkered with de Palma's Mercedes stubborn clutch, Mulford was sent off at 11:15 amid a cloud of smoke. The familiar sight to old followers of the races of the two men cranking the big Knox was repeated before the enthusiastic crowd. Mulford's mechanician was at the crank while he was aided in his efforts by a pit man who pulled on a long leather strap. The big motor took up its work at once.

Next came Clark in Mercedes No. 2. The powerful car jumped into motion at a word from the starter and was after Mulford. Then came the little Mason, winner of the day before in the Jencks trophy event. Following it de Palma in Mercedes No. 4 came to the tape. The onlookers were in sympathy with him and more than one hoped his ill luck of the past would not deprive him of honors this time. The little Italian determinedly shot his car down the course. Then Eddie Hearne, driving the Fiat which, according to the program, Teddy Tetzlaff was to drive, was sent off. It was doubtful if he would be able to finish the race because of his weak wrist.

Following Anderson's Stutz, Bergdoll in the Benz received the word from Starter Wagner. After what seemed an interminable wait Charlie Merz in the other Stutz was away. This left only the two yellow Mercers at the tape. Wishart was

RESULTS IN ELGIN TROPHY RACE AND FREE-FOR-ALL AS CLOCKED BY WARN

No.	Car	Driver		1 8 miles 2499 feet	2 16 miles 4998 feet	3 25 miles 2217 feet	4 33 miles 4716 feet	5 42 miles 1935 feet	6 50 miles 4434 feet	7 59 miles 1653 feet	8 67 miles 4152 feet	9 76 miles 1371 feet	10 84 miles 3870 feet	11 93 miles 1089 feet	12 101 miles 3588 feet	13 110 miles 807 feet	14 118 miles 3306 feet	15 127 miles 525 feet	16 135 miles 3024 feet	17 144 miles 243 feet
1	Knox six....	Mulford-Chandler	El. time.		14 :21	21 :28	28 :03	36 :08	43 :22	50 :41	59 :43	66 :55	73 :55	80 :58	87 :56	95 :00	102 :08	112 :39	120 :14	[illegible]
			Lap time	7 :15	7 :06	7 :07	7 :25	7 :15	7 :14	7 :19	9 :02	7 :12	7 :00	7 :03	6 :58	7 :04	7 :08	10 :31	7 :15	[illegible]
2	Mercedes ...	Clark	El. time.		16 :48	24 :16	31 :37	28 :59			Out—broken rear wheels									
			Lap time	9 :25	7 :23	7 :38	7 :21	7 :22												
3	Mason Spl..	Roberts	El. time.	8 :03	15 :52	23 :45	31 :41	39 :42	47 :54	56 :09	64 :22	72 :26	80 :28	88 :21	96 :18	104 :02	111 :53	119 :39	127 :26	135 :[illegible]
			Lap time	8 :03	7 :49	7 :53	7 :56	8 :01	8 :12	8 :15	8 :13	8 :04	8 :02	7 :53	7 :57	7 :44	7 :51	7 :46	7 :47	[illegible]
4	Mercedes ...	De Palma...	El. time.		14 :71	21 :34	28 :45	36 :01	43 :23	50 :41	59 :14	66 :21	73 :32	80 :39	87 :47	94 :55	102 :17	110 :12	117 :33	124 :[illegible]
			Lap time	7 :08	7 :09	7 :18	7 :10	7 :14	7 :22	7 :18	8 :33	7 :07	7 :11	7 :01	7 :08	7 :08	7 :22	7 :55	7 :21	[illegible]
5	Fiat 70.....	Hearne-Hill	El. time.		15 :38	23 :41	31 :32	39 :07	46 :45	54 :11	61 :27	68 :39	75 :50	83 :07	90 :28	97 :37	116 :36	124 :05	131 :32	139 :[illegible]
			Lap time	7 :52	7 :46	8 :03	7 :51	7 :35	7 :38	7 :26	7 :16	7 :12	7 :11	7 :17	7 :27	7 :09	18 :59	7 :29	7 :27	[illegible]
7	Stutz	Anderson ..	El. time.		15 :29	23 :01	30 :43	38 :16	45 :50	53 :10	60 :49	68 :23	75 :54	83 :26	90 :56	98 :27	105 :59	113 :24	120 :55	129 :[illegible]
			Lap time	7 :51	7 :38	7 :32	7 :42	7 :33	7 :34	7 :20	7 :30	7 :34	7 :31	7 :32	7 :31	7 :29	7 :32	7 :25	7 :31	[illegible]
*8	Benz	Bergdoll	El. time.		14 :04	20 :55	27 :59	34 :57	41 :58	49 :00	55 :58	63 :00	70 :10	77 :11	84 :13	91 :06	98 :11	105 :22	112 :28	119 :[illegible]
			Lap time	7 :09	6 :55	6 :51	7 :04	6 :58	7 :01	7 :02	6 :58	7 :32	7 :10	7 :01	7 :02	6 :53	7 :05	7 :11	7 :02	[illegible]
12	Stutz	Merz	El. time.		15 :29	23 :03	30 :38	38 :12	45 :50	53 :29	61 :11	68 :48	76 :27	84 :05	91 :42	102 :50	113 :36	121 :30	129 :18	137 :[illegible]
			Lap time	7 :51	7 :38	7 :34	7 :35	7 :34	7 :38	7 :39	7 :42	7 :37	7 :39	7 :38	7 :37	11 :08	10 :46	7 :54	7 :48	[illegible]
14	Mercer 35...	Wishart ...	El. time.	8 :07	16 :05	24 :03	31 :54	39 :40	47 :25	55 :03	62 :35	70 :10	77 :43	85 :19	92 :59	100 :44	108 :24	116 :02	123 :35	131 :[illegible]
			Lap time	8 :07	7 :58	7 :58	7 :51	7 :46	7 :45	7 :38	7 :32	7 :35	7 :33	7 :36	7 :40	7 :45	7 :40	7 :38	7 :33	[illegible]
15	Mercer 35...	Hughes	El. time.		14 :55	22 :13	29 :29	39 :38	47 :13	54 :32	61 :52	69 :19	76 :41	84 :06	91 :27	98 :47	107 :55	115 :23	122 :48	131 :[illegible]
			Lap time	7 :36	7 :19	7 :18	7 :16	10 :09	7 :35	7 :19	7 :20	7 :27	7 :22	7 :25	7 :21	7 :20	9 :08	7 :28	7 :25	[illegible]

* In free for all only

Double Victory of de Palma's Mercedes

German Car First in Free-for-All and Elgin Trophy Contests

HUGHES IN MERCER, WINNER OF AURORA TROPHY

CARS PARKED ON BRITTEN'S HILL IN HOMESTRETCH

next to go, Hughie Hughes alone remaining. It was not until nearly time for Hughes to come to the line before his attendants cranked his motor and with the good wishes of the crowd he was off after the others.

Early Stages of Race

Hardly was Hughes out of sight around the Hornbeek turn when Mulford, running well, hove into sight and had soon completed his first lap. Then came de Palma in his Mercedes, driving like a demon, and having passed Clark in the other Mercedes and Roberts in the Mason in the first lap. He was soon out of sight after Mulford. He had made the circuit in 7:08, 7 seconds faster than Mulford, putting him in first place immediately. This gave Mulford second position, while Hughes was third, Merz fourth, Hearne fifth in the Elgin race, while, considering all the cars, the Benz, which was not entered in the Elgin, was second, with Mulford in the Knox third and Hughes fourth.

Bergdoll was driving at terrific speed and succeeded in coming to first place in the second lap, while de Palma, also getting all the power possible out of his Mercedes, had to be contented with second position. Mulford was in third place. In the third lap Mulford changed positions with de Palma, Bergdoll in the Benz still retaining the lead. This he held from lap No. 2 up through the twenty-second lap, or 186⅓ miles of his long grind of 305 miles. In this lap he was obliged to stop on the back stretch on account of tire trouble. This delay gave de Palma the lead which he maintained in the twenty-third and twenty-fourth laps. He would, no doubt, have led Bergdoll longer had he not been obliged to stop at the pit at the end of the twenty-fourth lap to take on gasoline and oil and to replace his left rear tire. This wait put Bergdoll again in the lead, which he retained for ten of the remaining twelve laps of the free-for-all race. De Palma was now in second place, while in the same lap Mulford was a close third, which position he had held since the fifteenth lap, or 127 miles, had been passed. He was pressing de Palma closely and in the twenty-sixth lap succeeded in regaining second position, about

ECTRICAL TIMING DEVICE, SHOWING TIMES FOR ALL THE LAPS

20 169 miles 2460 feet	21 177 miles 4959 feet	22 186 miles 2178 feet	23 194 miles 4677 feet	24 203 miles 1896 feet	25 211 miles 4395 feet	26 220 miles 1614 feet	27 228 miles 4113 feet	28 237 miles 1332 feet	29 245 miles 3831 feet	30 254 miles 1050 feet	Position at finish	Miles per hour	31 262 miles 3549 feet	32 271 miles 768 feet	33 279 miles 3257 feet	34 288 miles 486 feet	35 296 miles 2985 feet	36 305 miles 204 feet	Position at finish	Miles per hour
150:32 7:00	157:29 6:57	164:28 6:59	171:31 7:03	178:39 7:08	185:46 7:07	192:56 7:10	200:03 7:07	206:57 6:54	217:30 10:33	226:09 8:39	2	67.4	233:28 7:19	241:01 7:35	249:29 8:28	258:22 8:53	266:14 7:52	274:08:72 7:54	3	66.6
160:08 7:48	167:58 7:50	175:42 7:44	183:30 7:48	191:16 7:46	199:07 7:48	206:58 7:51	214:50 7:52	222:40 7:50	230:30 7:50	238:17 7:47	4	63.8								
145:32 7:01	152:36 7:07	159:37 7:01	166:43 7:06	174:01 7:18	183:46 9:45	190:59 7:13	198:38 7:39	207:33 8:45	214:57 7:24	223:20 8:23	1	68.4	230:23 7:03	237:39 7:16	244:53 7:04	251:51 6:58	258:47 6:56	265:36:25 6:49	1	68.9
162:23 7:47	169:59 7:36	177:47 7:48	185:24 7:37	193:08 7:44	200:48 7:40	212:27 7:39		Out—broken gearset housing												
153:29 8:43	161:08 7:39	169:32 8:24	178:26 8:54	186:55 8:29	199:24 12:29	209:46 10:22	217:14 7:28	224:48 7:34	232:24 7:36	239:57 7:33	5	63.3								
144:14 10:20	151:19 7:05	158:45 7:26	168:40 9:55	176:00 7:20	183:14 7:14	190:22 7:08	197:32 7:10	204:44 7:12	211:52 7:08	219:04 7:12			226:25 7:21	233:45 7:20	243:19 9:34	250:57 7:38	259:26 8:29	270:28:28 11:02	2	67.5
160:08 7:39	167:49 7:41	175:36 7:47	183:17 7:41	190:58 7:41	198:30 7:32	206:15 7:45	214:00 7:45	221:34 7:34	229:16 7:42	236:43 7:27	3	64.2								
155:10 7:32	170:49 15:39	187:55 17:06	195:43 7:48	226:59 31:16	Out—broken oil lead and water pump															

—Burnt-out connecting rod bearings

GIL ANDERSON IN STUTZ, SECOND IN ILLINOIS CUP

TRUSSEL IN FALCAR, THIRD IN AURORA CUP RACE

PULLEN IN MERCER, SECOND IN AURORA CUP RACE

2 minutes behind Bergdoll in the Benz, while de Palma was less than a minute more than he. The twenty-ninth lap saw tire trouble for both Mulford and de Palma. The latter stopped at the pit after completing this lap and to him the short wait seemed endless. He was all eagerness to be away. But before he was off again Mulford also stopped at his pit for identically the same reason.

De Palma Grabs an Opportunity

Immediately de Palma saw his chance. He pressed his attendants to their utmost, and was away again, fairly lifting his machine from the ground in getting off. There was only a single lap remaining to the Elgin race and de Palma realized it fully. He retained his advantage, for the first time in his career crossing the tape the winner of a big road race. But he did not slacken his speed, for he had still six laps to go before finishing the free-for-all race in which he was also entered. Mulford was next to finish.

Meanwhile the other cars were changing their positions somewhat. After completing three laps Hearne was obliged to quit the Fiat No. 5 because of his wrist becoming too weak to properly control the car and George Hill, mechanician for Tetzlaff, took his place in the big red car. Hill lost no time in getting the Fiat under way again and drove daringly and with the nerve of a veteran for twenty-three laps. When Hill took the wheel he was in sixth place, but in the sixth lap Clark's Mercedes, which had been in fifth position, was put out of the race by accident, giving this position to Hill in the Fiat. In the eighth lap Hill took the fourth position in the Elgin, which had been held by Merz in the Stutz. Two laps later he took third position from Anderson in the other Stutz and retained it through the thirteenth, when he dropped to seventh place, Merz regaining his former place in the van. Trouble with the transmission was rapidly taking on serious proportions, judging by the noise emanating from Hill's machine, and after completing twenty-six laps he was obliged to drop out of the race on this account. He was then in sixth place.

Clark Meets with Mishap

The first car to drop out was the Mercedes driven by Clark, which after being in fifth place on the fifth lap, was preparing to negotiate the Hornbeek turn, the first after passing the pits, was driven into the straw banking of the turn and damaged sufficiently to put it out of the race. Clark miscalculated the turn, ran into a small concrete culvert located at this point, with sufficient force to blow up one of his tires. This sent his car swerving to the right and into a fence, breaking both rear wheels and pitching him and his mechanician over the fence. Neither was seriously hurt, each being only slightly bruised. Had it not been for the straw bales banking the turn the accident undoubtedly would have been serious. Curi-

ously enough, Clark had objected previously to the use of the straw for this purpose.

As a safety element these straw bales at the four turns demonstrated their worth. Not only did they save Clark and his mechanician, but they prevented injury to Wishart, whose Mercer got off the course at one turn, and to Wordingham, who also ran into them, ditching his Herreshoff car and breaking one of its wheels without injury to himself or his companion.

Stutz Next to Finish

Following Mulford, Merz in Stutz No. 12 was next to finish in the Elgin race. He came into this position due to the accident to Wishart's car in the twenty-fifth lap when he broke his oil lead and water pump, and to Hughes' Mercer, which was running well up to the eighteenth lap, when a burnt-out crankshaft bearing rendered it useless as a contender for the honors.

These various accidents left only three cars to contend for the free-for-all honors. These were Bergdoll's Benz, de Palma's Mercedes and Mulford's Knox. The performance of these three cars was the most sensational of the 2 days' meet. Bergdoll was in the lead at the beginning of the thirty-first lap, with de Palma a close second and Mulford trailing him. The Benz, except for three laps, the first, the twenty-third and the twenty-fourth, had been the leading car so far throughout the entire distance of 203 miles. It looked as if the three would finish in the order named above. Each was maintaining terrific speed and no change in their relative positions took place until the thirty-fifth, or next to the last, lap.

Bergdoll was about a minute in the lead of de Palma when on the back stretch he was forced to stop for a tire change. This gave de Palma an opportunity for the second time that day, and in the thirty-fifth lap he passed the Benz while it was still making the tire change. There was no stopping him now and Bergdoll was obliged to cross the tape second to the Italian, after practically leading the field from the start of the 305-mile run. This misfortune of Bergdoll's when victory was almost his recalls de Palma's ill-luck at Indianapolis when he was obliged to succumb to engine trouble and to give the race to Joe Dawson when he had led for 496 of the 500 miles.

Mulford did not finish his race. On the thirty-third lap, when nearing the grand stand he was overcome by the intense heat and nearly lost control of the speeding Knox. His mechanician leaned over and guided the big car to the pit. Mulford was lifted from the car and assisted to the hospital tent, while his mechanician, William Chandler, jumped into the driver's seat and one of the pit attendants got in beside him and the Knox was sent away again.

MORT ROBERTS IN MASON, FOURTH IN ELGIN TROPHY RACE

WISHART CHANGES TWO TIRES ON HORNBEEK TURN

SOLDIERS GOING TO THEIR POSTS IN VELIE TRUCK

Three Class Races Decided on Friday

Endicott, Hughes and Merz Winners on First Day

CARS ON COURSE AFTER CONCLUSION OF RACES

Car No.	Car	Lap	Lap Time	Speed
FASTEST LAPS FOR ALL DRIVERS				
Free-for-All				
1	Knox six	28	6:54	73.6
2	Mercedes	4	7:21	69.1
4	Mercedes	36	6:49	74.5
5	Fiat	13	7:09	71.0
[illegible]	Benz	3	6:51	74.1
15	Mercer	4	7:11	70.7
Elgin Trophy				
1	Knox six	28	6:54	73.6
2	Mercedes	4	7:21	69.1
3	Mason Spec	13 & 22	7:44	66.7
4	Mercedes	15	6.55	73.4
5	Fiat	13	7:09	71.0
7	Stutz	15	7:25	68.5
12	Stutz	30	7:27	[illegible]
14	Mercer	8	7:32	67.4
15	Mercer	4	7:11	70.7
Illinois Trophy				
21	Stutz	9 & 21	7:36	[illegible]
22	Rayfield	1	8:35	59.1
23	National	3 & 6	7:41	66.1
24	Stutz	5	7:28	68.0
Aurora Trophy				
31	Mercer	10	7:50	64.8
32	Falcar	9	7:22	69.0
33	Falcar	7 & 15	9:03	56.2
34	Mason	11	7:58	63.7
35	Mercer	5, 8 & 9	7:39	66.4
36	Mercer	17	7:23	68.8
Jencks Trophy				
41	Mason Special	3	7:51	64.7
42	Ford	5	11:52	42.9
43	Herreshoff	1	10:49	47.0

ON Friday, the Jencks, Aurora and Illinois trophy events were run simultaneously. Merz in the Stutz was winner of the Illinois trophy event, while his team mate Anderson, also in a Stutz, was a good second. These two cars were the only ones to finish the race, which was of twenty-four laps, or 203 miles, 1,896 feet. The Rayfield and National entries in this race did not finish, the former driven by Hobbs being out in the third lap with a broken crankshaft bearing and the National, piloted by Whalen, being obliged to quit the race after nine laps on account of a break in the magneto drive.

Merz led the race from the start, while up to the eighth lap Whalen in the National was a close second, cutting down the former's lead with each lap up to the fifth. In completing the fourth lap it looked as if Whalen might overtake his rival, so quickly had he gained. At the end of the fourth lap the time of the two leaders was as follows: Merz, Stutz, 30:20; Whalen, National, 30:44.

Merz made this fourth lap in just 1 second less time than Whalen, completing the circuit in 7:34. In the next lap, however, Merz made the fastest time of his race and increased his lead over the National by 9 seconds.

Whalen retained second place up to the eighth lap, while the other Stutz—driven by Anderson—was fast gaining on him. It was at the completion of his eighth lap that the latter succeeded in nosing out the National for second place. Whalen completed another lap, and was on his tenth circuit when misfortune overtook him and put his car out of the race. The magneto coupling broke and this stopped the National.

Whalen's dropping out left the race entirely in the hands of the Stutz cars, which had a merry time of it together from the ninth lap to the finish. Both cars continued to perform consistently to the end.

Merz maintained his lead over Anderson practically as at the tenth lap. In his twelfth lap, however, Merz lost 50 seconds when he was obliged to stop at his pit for gasoline and oil. He was off again with a lead of but 8 seconds for the twelfth lap over his rival, Anderson. The latter took advantage of this opportunity

RESULTS IN AURORA TROPHY RACE FOR 231-300 CLASS.

No.	Car	Driver		1 8 miles 2499 feet	2 16 miles 4998 feet	3 25 miles 2217 feet	4 33 miles 4716 feet	5 42 miles 1935 feet	6 50 miles 4434 feet	7 59 miles 1653 feet	8 67 miles 4152 feet
31	Mercer	Pullen	Elapsed time	8:21	16:15	24:11	32:07	40:05	48:01	56:06	64:30
			Lap time	8:21	7:54	7:56	7:56	7:58	7:56	8:05	8:24
32	Falcar	Hastings	Elapsed time	10:15	29:30	30:48	40:36	50:47	60:57	70:55	83:16
			Lap time	10:15	10:15	10:18	9:48	10:11	10:10	9:58	12:21
33	Falcar	Trussel	Elapsed time	9:28	22:57	32:05	41:13	50:44	60:04	69:07	78:17
			Lap time	9:28	13:29	9:08	9:08	9:31	9:20	9:03	9:10
34	Mason	Roberts	Elapsed time	8:36	23:10	31:18	39:26	47:41	55:56	64:41	72:40
			Lap time	8:36	14:34	8:08	8:08	8:15	8:15	8:45	7:59
35	Mercer	Wishart	Elapsed time	8:04	15:45	23:30	42:01	49:40	57:23	65:07	76:46
			Lap time	8:04	7:41	7:45	18:31	7:39	7:43	7:44	7:39
36	Mercer	Hughes	Elapsed time	7:52	15:26	22:53	30:32	38:33	46:20	54:22	62:17
			Lap time	7:52	7:34	7:27	7:39	8:01	7:47	8:02	7:55

RESULTS IN THE ILLINOIS TROPHY RACE FOR 301-450 CLASS.

No.	Car	Driver		1 8 miles 2499 feet	2 16 miles 4998 feet	3 25 miles 2217 feet	4 33 miles 4716 feet	5 42 miles 1935 feet	6 50 miles 4434 feet	7 59 miles 1653 feet
21	Stutz	G. Anderson	Elapsed time	8:00	15:49	23:30	31:15	38:54	46:34	54:12
			Lap time	8:00	7:49	7:41	7:45	7:39	7:40	7:38
22	Rayfield	W. Hobbs	Elapsed time	8:35	34:32	Out—burned out crankshaft bearing.				
			Lap time	8:35	25:57					
23	National	N. Whalen	Elapsed time	7:46	15:28	23:09	30:44	38:21	46:02	53:45
			Lap time	7:46	7:42	7:41	7:35	7:37	7:41	7:43
24	Stutz	C. Merz	Elapsed time	7:44	15:16	22:46	30:20	37:48	45:18	52:51
			Lap time	7:44	7:32	7:30	7:34	7:28	7:30	7:33

Details of Curtain-Raising Contests

How the Mason, Mercer and Stutz Landed the Trophies

to cut down the breach between himself and Merz and on completing the next lap, the leader maintained his position by a margin of only 2 seconds.

In the following lap, however, Anderson was compelled to stop at the pit to take on gasoline and oil, losing 30 seconds by this, giving Merz a lead of 1 minute 4 seconds for the fourteenth lap. From this time on until the end of the race, the two cars stayed about the same distance apart.

The two pit stops for lubricant and fuel were the only ones made during the entire race, no tire trouble being met with by the two cars, a rather remarkable performance.

VIEW OF OFFICIAL STANDS ON INSIDE OF COURSE

RESULTS IN JENCKS TROPHY RACE FOR 230 AND UNDER CLASS, NON-STOCK, WON BY MASON

No.	Car	Driver		1 8 miles 2499 feet	2 16 miles 4998 feet	3 25 miles 2217 feet	4 33 miles 4716 feet	5 42 miles 1935 feet	6 50 miles 4434 feet	7 59 miles 1653 feet	8 67 miles 4152 feet	9 76 miles 1371 feet	10 84 miles 3870 feet	11 93 miles 1089 feet	12 101 miles 3588 feet	Position at finish	Miles per hour
41	Mason Special.	Endicott	Elapsed time	8:05	16:07	23:58	32:13	40:42	49:18	57:59	66:28	74:51	83:24	92:11	100:42:9	1	60.57
			Lap time.....	8:05	8:02	7:51	8:15	8:29	8:36	8:41	8:29	8:23	8:33	8:47	8:31		
42	Ford 1911....	Henning	Elapsed time	12:15	29:46	41:40	54:21	66:13	87:28	Out—ditched						2	
			Lap time	12:15	17:31	11:54	12:41	11:52	21:15								
43	Herreshoff 20.	Wordingham ..	Elapsed time.	10:49	Out—broken wheel											3	
			Lap time.....	10:49													

Six cars, contenders in the Aurora trophy race for cars of from 201 to 300 cubic inches piston displacement, were the next to be sent off by Starter Fred J. Wagner amid a cloud of smoke and in order according to their entry numbers. Hughie Hughes in his Mercer, although the last to start, jumped into the lead on the first lap and retained that position throughout the entire race of 152 miles. His time for the initial lap was 7:52, one of the slowest of his race. His team mate, Spencer Wishart, was in second position for three laps, in the fourth lap giving up this position to Pullen in another Mercer. The latter did not lose this position throughout the rest of the race, crossing the tape second to Hughes.

Jencks Trophy Race

The Jencks trophy event went to Mason entry No. 41, which was driven by Endicott at an average speed of 60.7 miles an hour. He had practically no opposition throughout the entire race and was the only one of the three starters to complete the run of 101 miles 3,588 feet, or twelve laps. His total time was 100 minutes 42.9 seconds. The other two entries were Ford and the veteran Herreshoff driven by Wordingham.

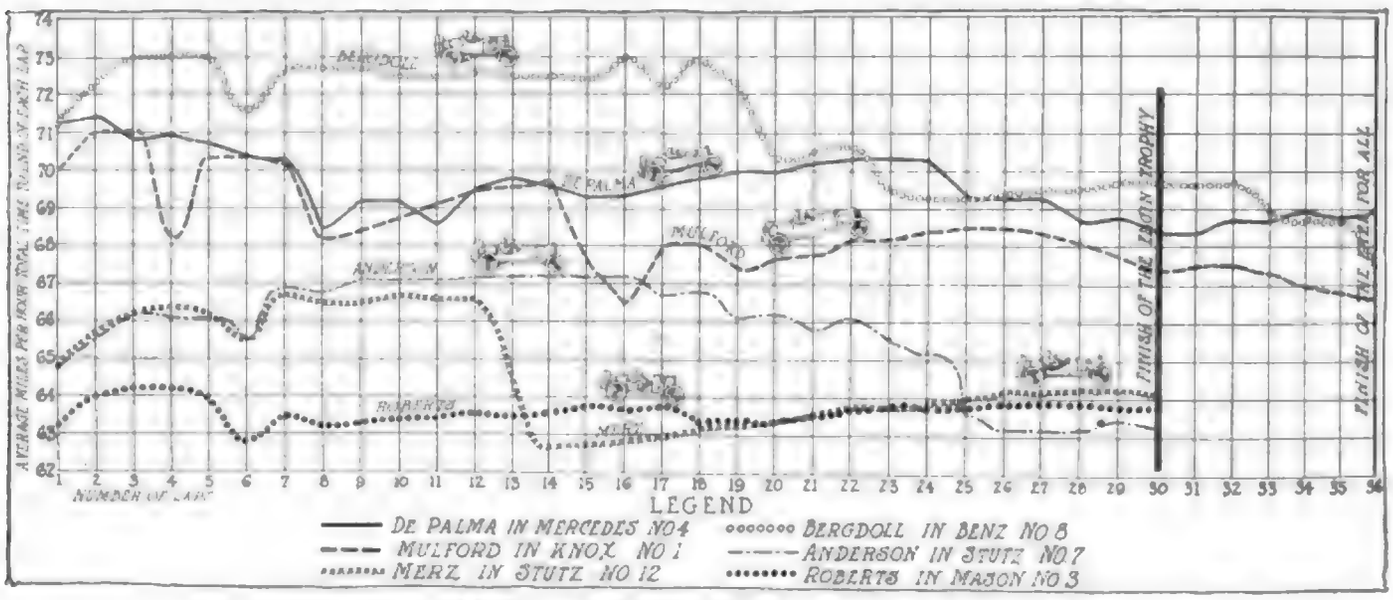
NON-STOCK, WON BY HUGHIE HUGHES IN MERCER

9 76 miles 1371 feet	10 84 miles 3870 feet	11 93 miles 1089 feet	12 101 miles 3588 feet	13 110 miles 807 feet	14 118 miles 3306 feet	15 127 miles 525 feet	16 135 miles 3024 feet	17 144 miles 243 feet	18 152 miles 2742 feet	Position at finish	Miles per hour
72:58	80:28	90:28	98:25	106:21	114:21	122:09	130:15	138:26	146:31:45	2	62.8
8:08	7:50	10:00	7:57	7:56	8:00	7:48	8:06	8:11	8:05		
90:38	105:19	115:13	125:04	134:57	144:51	154:33	104:34	174:20	183:57:53	5	49.9
7:22	14:41	9:54	9:51	9:53	9:54	9:52	9:51	9:54	9:37:53		
87:28	96:44	105:55	115:05	124:09	133:15	142:18	151:16	160:14	169:19:3	3	54.06
9:11	9:16	9:11	9:10	9:04	9:06	9:03	8:58	8:58	9:05		
80:41	88:47	96:45	104:45	113:58	128:53	141:12	153:50	167:23	178:11:74	4	51.4
8:01	8:06	7:58	8:00	9:13	14:55	12:19	12:38	13:33	10:48		
80:25	96:00	106:37	114:26	122:17	Carbureter caught fire						
7:30	15:35	10:37	7:49	7:51	Burned wiring.						
70:09	77:58	86:24	94:31	102:28	110:10	117:57	125:42	133:01	140:40:11	1	65.0
7:52	7:49	8:26	8:07	7:57	7:42	7:41	7:45	7:23	7:35		

NON-STOCK, RUN ON FRIDAY AND WON BY MERZ IN A STUTZ

8 67 miles 1152 feet	9 76 miles 1371 feet	10 84 miles 3870 feet	11 93 miles 1089 feet	12 101 miles 3588 feet	13 110 miles 807 feet	14 118 miles 3306 feet	15 127 miles 525 feet	16 135 miles 3024 feet	17 144 miles 243 feet	18 152 miles 2742 feet	19 160 miles 5241 feet	20 169 miles 2460 feet	21 177 miles 4959 feet	22 186 miles 2178 feet	23 194 miles 4677 feet	24 203 miles 1896 feet	Position at finish	Miles per hour
61:40	69:25	76:56	84:33	92:08	99:48	108:27	116:26	124:22	132:11	140:02	147:47	155:36	163:12	170:56	178:37	186:14:15	2	65.6
7:37	7:36	7:31	7:37	7:35	7:40	8:39	7:59	7:56	7:49	7:51	7:45	7:49	7:36	7:44	7:41	7:37		
61:56	72:06	Out—Magneto drive trouble																
8:11	10:10																	
60:27	68:02	75:38	83:13	92:00	99:46	107:22	114:59	122:78	130:23	138:11	146:00	153:40	161:22	169:12	176:49	184:32:25	1	66.11
7:36	7:35	7:36	7:35	8:47	7:46	7:36	7:37	7:39	7:45	7:48	7:49	7:40	7:42	7:50	7:37	7:43		

Elgin Races as Viewed from the Pits



RELATIVE POSITIONS OF THE CARS FINISHING IN THE ELGIN TROPHY AND FREE-FOR-ALL

The average speed made by each car for the distance from the start to the end of each lap is shown, as well as the relative positions of the contestants. Notice the neck-and-neck race between Roberts and Merz, with Merz finally creeping ahead

FREEDOM from tire trouble was one of the characteristics that again distinguished this year's races at Elgin. There were in all, only twenty-five cases of tire trouble in the whole 2 days of racing, three of these being responsible indirectly for putting cars out of the race. Only two stops at the pits were made in the first day's events on account of tire trouble and these were both in the Aurora trophy race. Neither in the small-car race or the Illinois trophy event were stops necessitated in the cars that finished.

Few Tire Replacements

In the Elgin trophy and the free-for-all sixteen tire replacements were made at the pits; ten of these were made on the right rear wheels, four on left rear wheels and one on a front wheel. One other tire stop was occasioned by the replacement of a new spare at the pits for one that had been taken off at another point on the course.

Seven stops were made to refill oil, gasoline and water tanks in the second day of racing, one for carbureter adjustment, and two to change drivers. Carbureter adjustment occasioned one stop on the first day, as did the necessity for tightening up shock absorbers. Two stops were made to refill fuel, oil and water tanks on the first day, both in the Illinois trophy event.

There were six stops made during Friday's racing, and the total number of stops on the following day was twenty. Very often advantage was taken of the enforced halt for tire changes to replace depleted supplies of fuel, water and lubricant.

On the whole, the work at the pits showed lack of training and preparation by the attendants. Too much time was taken in tire changes, jacks were too small at the base and were too slow. One man wasted 2 valuable minutes endeavoring to force a tire on the rim with the brace wrench wedged between it and the roadbed. The Stutz, Mercer and Fiat pits seemed to be the best organized. The quick-acting jacks used at the Mercer pit facilitated rapid tire changes. The demountable wheels on Hughes' Mercer also made changes quick, although it is not proven by these races that the use of wire spokes makes tire changes necessary any less frequently. Hughes made two changes during his 144 miles of running. From the track, however, it looked as though Hughes' car held to the road better than did any of the others, possibly because the vibration due to roughness of the road surface was taken up by the wire spokes instead of being transmitted to the springs.

Friday's small-car race for the Jenck's trophy was unique in one respect, and that during the whole of the 96 miles of the race none of the three cars stopped at the pits, either for tires, or mechanical work on the car for replacement of gasoline, fuel or oil.

Henning's Ford ran a slow but conservative race for the first 50 miles, when it was ditched and out of the contest. Although the Ford was running but little better than half as fast as the Mason, it only needed to keep going for the total distance to make second place as the only other starter, the Herreshoff, was out. Hennings' mount was a veteran and was beginning to loosen up badly, particularly the radiator. One side of the radiator panel had loosened and was threatening to fall off at any moment.

This car came near being ruled off before the start. The exhaust manifold had been taken off and no arrangements had been made to lead the exhaust gases outside the hood. F. E. Edwards, chairman of the technical committee, refused to let the car start when it lined up until the lower half of the bonnet was removed to allow the motor to exhaust directly to the air.

The Mason, driven by Endicott, ran a consistent race without a stop and finished alone.

Stops in Aurora Trophy

Of the six contestants for the Aurora trophy, only three cars stopped at the pits during the 152 miles of the race and one of these was entirely unnecessary. The latter was when Hughes, in the Mercer, stopped in his twelfth lap to inform the pit attendants that his teammate, Pullen, in the Mercer No. 31 had blown a tire on the back stretch. After thus relieving the minds of the pitmen on this score, Hughes resumed his place in the lead without further stops.

The first stop of the day for anyone was at noon, when Roberts in the Mason halted for 45 seconds to tighten up a shock absorber which had worked loose. Fifty minutes later Wishart's Mercer stopped to change a left rear tire and take on two spares, which had been used in tire changes at other points on the course.

One minute 55 seconds was consumed at the pit. The only other stop in this race was when Wishart's Mercer stopped again for 2 minutes and 30 seconds to adjust the

a right rear tire. In the fourteenth lap carbureter. The only car which seemed to have suffered from tire trouble at all during this race were the two Mercers driven by Pullen and Wishart. Pullen's only stop was on the back stretch as he did not stop to replace his spare at the pit.

In the Illinois trophy race, although the longest of Friday's racing, was freer from pit work than was the Aurora trophy. There were only two stops at the pits recorded, these were the two Stutzes, the only cars to finish. The first stop of this race was Merz's Stutz which stopped for gasoline and oil after the first 100 miles. Fifty seconds was consumed filling the tanks. Fifteen minutes later the other Stutz, driven by Anderson, halted to refill its tanks and was away again in less than ½ minute. This race was singularly free from tire troubles, considering the fact that it was over 200 miles at an average of better than 60 miles an hour. No stops were made at the pit for tire changes and no spares were taken on. The only mechanical difficulty in the Illinois trophy race occurred to the Rayfield and National entries, the former going out in the third lap on account of a broken connecting rod bearing, while the latter was put out by trouble with the magneto drive.

Elgin National and Free-For-All

Saturday's racing was more prolific in pit work than that of the day before. This was to be expected as it was not only longer distance but there were more cars entered and bigger cars, the high speed burning up the tires and requiring frequent replacements of gasoline and oil. It was necessary, as well, to relieve the drivers before the end of the 250 miles in two instances. The first stop of the day was for the latter purpose when Hearne, who was piloting the No. 5 Fiat, stopped at the end of his third lap to be replaced at the wheel by George Hill. It was 15 seconds after pulling up at the pit that Hill had the machine in action again. Hill stopped in the fourteenth lap to take on gasoline, oil and water and a spare tire which detained him for 1 minute and 45 seconds. His last stop was at the end of the twenty-seventh lap when the car limped in with a broken gearset housing and notified the starter that it was out of the race for good.

Hughie Hughes in the Mercer halted at the pit to take on a spare wheel in the record time of 15 seconds, a right rear wheel had been replaced on the course. This stop was in the sixth lap. His only other stop was in the fifteen lap, when he took on gas, oil and water, and changed a right rear wheel, and was on his way again in 45 seconds. Hughes was the only driver to employ demountable wheels.

After running approximately 150 miles Hughes had to pull in and withdraw from the race on account of a burned out connecting rod bearing. De Palma's first stop was in his seventh lap when he changed a right rear tire, requiring 2 minutes 30 seconds. He ran for 150 miles without further stop till in the twenty-fourth lap he was held for 1 minute 36 seconds to refill the oil, fuel and water tanks and change the left rear tire. A right rear tire was changed in the twenty-ninth lap and the carbureter adjusted, at which time he was halted for 1 minute 15 seconds.

Bergdoll in the Benz made only two stops at the pit. He had run 186 miles without a stop of any description but in the twenty-second lap had to replace a tire on the back stretch halting at the pits for an extra tire and to take on gas, oil and water. Up to this time Bergdoll was the leader in the free-for-all but his stop of 2 minutes 15 seconds cost him the lead for a time. His only other stop was in the last lap, at which time a right rear tire was changed and some difficulty was found in replacing it. The time consumed, which was nearly 3 minutes, was sufficient to cost him first place in the free-for-all.

Mulford had run only 60 miles when he made his initial halt at the pits to change both rear tires were changed. His next stop was in the next to the last lap of the Elgin race when a right rear tire was again replaced, 1 minute 22 seconds being consumed in the operation. At the end of the thirty-third lap the Knox came into the pit with Mulford exhausted and his mechanician, Chandler replaced him. The Mercedes, driven by Clark, made no stop during the 45 miles of running, but went out in the sixth lap when it ran into the fence and broke both rear wheels at Hornbeck's turn. Roberts in his Mason special ran 144 miles before making his first stop, at which time he was halted for 1 minute to refill his fuel and oil tank and his radiator. This was his only stop in the Elgin trophy race and he encountered no tire trouble whatever, the only one to finish the race without tire trouble.

Two Stops in Succession

The two Stutz cars were comparatively free from troubles which required pit work. Merz's car made two stops in succession in the fourteenth and fifteenth lap, the last of these was for an extra tire but he was away again in 30 seconds and the first was for gas and oil and a right rear tire replacement, requiring 3 minutes time. With the exception of these two stops, Merz ran without a halt. Anderson likewise stopped twice at the pits, once in the sixteenth lap for 1 minute for oil and fuel and again in the twentieth lap to change the left rear tire. This held him at the pits for 1 minute and 23 seconds.

Wishart's Mercer, No. 14, pulled in at the pits at the end of its twenty-first lap of the course with oil running in a stream from a broken oil lead from the tank at the rear. The motor was smoking hot and needed water badly. While Wishart filled the crankcase of the motor with oil, his mechanic endeavored to fill up the water circulating system. When water could be retained in the system, it was found that the water pump housing was broken and the cooling water ran out of it. Nevertheless, Wishart started up again after a loss of 5 minutes and ran three more laps.

TIRE AND MOTOR EQUIPMENT AND CYLINDER SIZES OF ALL THE CARS STARTING IN ELGIN RACES

Cup 1st day	Cup 2nd day	Car No	Car	Bore	Stroke	Piston displacement	Magneto	Ignition system	Carbureter	Tires: Make	Tires: Size Front	Tires: Size Rear	Gear ratio	Speeds	Direct drive	Shock absorbers
..	1		Knox six	4¾	5½	389.9	Bosch	2 spark independent	Rayfield	Michelin	36—4½	37—5	1.95	3	3	Mondex
..	2		Mercedes	5¼	7⅛	587.3	Bosch	Double	Rayfield	Michelin	34—4	35—5		4	..	Truffault Hartford
41	3		Mason Spl.	5¼	5	235.8	Splitdorf	Dual	Schebler	Michelin	32—3½	32—3½	2 3-5	3	3	Mondex
..	4		Mercedes	5½	7.06	644.6	Bosch	Double	Rayfield	Michelin	32—4	37—5	1⅞	4	..	Mercedes
..	5		Fiat 70	5	7½	589.0	Bosch	Double	Rayfield	Michelin	34—4	35—5			..	Truffault Hartford
32	6		Falcar	4⅛	5½	280.6	Sportdorf		Rayfield	Michelin	32—4	32—4	2 11-16	3	3	Truffault Hartford
21	7		Stutz	4¾	5½	389.9	Splitdorf		Schebler	Michelin	34—4	35—5	2 1-3	3	3	Truffault Hartford
..	8		Benz	6 1-5	6 3-10	670.0	Bosch	2 magnetos	Benz	Fisk	36—4	36—4½		4	..	Bond and Mondex
32	10		Falcar	4⅛	5½	280.6	Splitdorf		Schebler	Michelin	34—4	34—4	2 16-19	3	3	Truffault-Hartford
23	11		National 40	5	5 11-16	442.0	Splitdorf		Schebler	Michelin	34—4	34—4				
24	12		Stutz	4¾	5½	389.9	Splitdorf		Schebler	Michelin	34—4	35—5	2 1-3	3	3	Truffault-Hartford
35	14		Mercer 35	4 39	5	300.0	Bosch		Rayfield	Firestone	32—4	32—4	2½	3	3	Truffault Hartford
36	15		Mercer 35	4 39	5	300.0	Bosch		Rayfield	*	32—4	32—4	2½	3	3	Truffault-Hartford
42	..		Ford 1911 T	3¾	4	283.5	Bosch	Single	Kingston	Michelin	30—3	30—3½	3	†	†	None
43	..		Herreshoff 20	3¾	3 5-16	291.0	Bosch	Single	Rayfield	Michelin	32—3½	32—3½	2¾	3	3	Truffault-Hartford
31	..		Mercer	4¼	5	300.7	Bosch		Rayfield	Firestone	32—4	32—4	2½	3	3	Truffault Hartford
34	..		Mason	3⅞	5	241.7	Splitdorf		Rayfield	Michelin	32—4	32—4	2 3-5	3	3	Truffault-Hartford
22	..		Rayfield 6	4	5½	276.5	Mea		Rayfield	Michelin	35—4	35—4	2⅛	4	3	Mondex

* Firestone front, Prowadink rear † Planetary

Road Racing Washes Its Popularity

Road racing has been a popular sport for many years, but it has never been so popular as it is now. Thousands of people have witnessed the Vanderbilt Cup race, the Grand Prize race, the Glidden tour, the Pike's Peak hill climb, the Indianapolis Speedway race, the Ormond-Daytona beach race, the Sioux City Speedway race, the Minneapolis Speedway race, the Los Angeles Speedway race, the Chicago Speedway race, the Cincinnati Speedway race, the Kansas City Speedway race, the Denver Speedway race, the San Francisco Speedway race, the Portland Speedway race, the Seattle Speedway race, the Spokane Speedway race, the Salt Lake City

American Cars in Foreign Markets

More than $30,000,000 Worth of Motor Products Was Shipped in a Year

WASHINGTON, D. C., Aug. 31—According to figures compiled by the federal bureau of statistics, $30,000,000 worth of American cars and parts found markets abroad during the fiscal year 1912, as against less than $1,000,000 worth 10 years ago. The figures show that the exports of motor cars to foreign countries in the fiscal year were valued at $21,500,000, or of parts thereof, including tires, $6,750,000. If to this were added the shipments to Hawaii and Porto Rico, we get for the year's sales of American cars outside of continental United States a round $30,000,000, since the value of motor cars and parts thereof sent to Porto Rico was nearly $1,000,000 and to the Hawaiian Islands a little over $1,000,000. The total number of cars exported to foreign countries was 21,757, valued at $21,550,139, averaging slightly less than $1,000 each, while those to the noncontiguous territory were higher, averaging $1,600 each.

The export price of American cars in 1912 averaged less than in any earlier year in the history of the export trade. The average for 1912, dividing the total number of cars exported into stated value, was $990 each, against $1,100 in 1911, $1,380 in 1910, $1,700 in 1909 and $1,880 in 1908.

On the import side the motor cars imported last year amounted to but about $2,000,000 in value, against more than $4,000,000 in 1907. The average import value of the cars brought into the country last year was $2,216 each, against $2,138 in 1911, $1,936 in 1910, $1,788 in 1909 and $2,392 in 1908. Thus the export price of American cars has fallen from $1,880 in 1908 to $990 in 1912, while the import price of foreign cars entering the country has only fallen from $2,392 in 1908 to $2,216 in 1912, the reduction in price on the export side being 47 per cent and on the import side but 8 per cent.

Coming Motor Events

September 9-12—Chicago Motor Club's truck demonstration.
September 8-25—San Sebastian Rally.
September 9—French Grand Prix; Le Mans, France.
*September 9-12—Commercial vehicle run; Chicago Motor Club.
September 11-14—Third annual reliability run of Automobile Club of Buffalo, Buffalo, N. Y.
September 14-21—Annual fall show; Chicago Automobile Trade Association.
September 17 — Grand Prix; Milwaukee, Wis.
*September 20—Wisconsin challenge and Pabst Trophy races; Milwaukee, Wis.
*September 21—Vanderbilt road race; Milwaukee, Wis.
September 17-20—Fire engineers' convention; International Association Fire Engineers, Denver, Colo.
September 25-October 6—Agricultural exhibition and plowing matches; Bourges.
September 30-October 5—American Road Congress; Atlantic City.
September—Track meet; Universal Exposition Co., St. Louis, Mo.
October 4-5—Track meet; Sioux City Auto Club, Sioux City, Ia.
October 5—Gallion hill climb.
*October 7—National tour Detroit to New Orleans; American Automobile Association.
*October 7-11—Chicago Motor Club reliability run, Chicago.
October 12—Track meet; Rockingham park, Salem, N. H.
October 24-25—Santa Trophy Team match, Chicago Motor Club.
November 2-3—Splash guard competition; Versailles.
November 6—Track meet; Shreveport Automobile Club, Shreveport, La.

*Sanctioned by A. A. A.

SHOWS

September 23-Oct. 3—Rubber show, Grand Central palace, New York.
September 28-Oct. 6—Exposition agricultural motor cars, Bourges, France.
October 2-12—Fire show, Madison Square Garden, New York.
October 7-12—St. Louis show.
November 8-16—Olympia show; overflow November 22-30 Agricultural Hall.
December 7-22—Paris salon.
January 6-11, 1913—Cleveland show.
January 4-11—Montreal show.
January 11-18—New York pleasure car show; Automobile Board of Trade; Madison Square Garden and Grand Central Palace.
January 11-22—Brussels, Belgium show, Centenary Palace.
January 20-25—New York truck show; Automobile Board of Trade; Grand Central Palace and Madison Square Garden.
January 20-25—Philadelphia show.
January 25-February 1—Montreal, Canada, show.
January 27-February 1—Detroit show.
February 1-8—Chicago show.
February 10-15—Chicago truck show.
February 10-15—Minneapolis show.
February 17-22—Kansas City show.
February 24-March 1—Show at Omaha, Neb.
March 3-8—Pittsburgh show.
March 8-15—Boston show.
March 17-22—Buffalo show.
March 19-23—Boston truck show.
March 24-29—Indianapolis show.

Aftermath of Elgin Road Races Told by Ralph de Palma

SOME interesting sidelights on the feature races of Saturday were told by Ralph de Palma, who stated that without a doubt it was the hardest contest in which he had ever participated. The weather was the hottest which has visited the middle west this year, and the boiling sun beat down furiously upon the speeding drivers, much to their discomfiture. According to de Palma, the back stretch was the hottest, and was very much like an oven, despite the fact that the big Mercedes which he was driving was travelling at a speed nearly 70 miles an hour. The heat from the engine swept directly back to the car's occupants to add to the sun's rays.

De Palma changed three tires during the 305-mile run, all at the pits. This, of course, means that after each blowout, he drove for some distance on the flat damaged tire or rim. It undoubtedly was quicker to do this than to stop at the point at which the tire gave way, since the facilities for change were better and quicker at the pit.

The Italian used a total of 29 gallons of gasoline for the thirty-six lap free-for-all, thus averaging 10.5 miles to the gallon. His tank has a capacity of 49 gallons, and while at the pit on one occasion he took on 10 gallons. On Friday the Merz Stutz used 21 gallons in the Illinois cup race and the Anderson Stutz 20 gallons in the same race.

Speaking of the course, de Palma stated that it was one of the best on which he has driven, and that it was an easy matter to pass any other car, the width being amply sufficient. At 90 miles an hour the slight roughness of the road surface is not noticeable at all, he stated, while at 60 miles, the unevenness is only slightly perceptible, and is by no means a disturbing factor. The course is better than that over which the French grand prix is run in that respect, in the recent French event he being obliged to run along for some 15 miles at certain parts of the French course before he was able to pass any other car.

On the twenty-ninth lap, the air pressure in the gasoline tank became so great that it was necessary to stop at the pit to reduce it. It had reached about 8 pounds to the square inch.

Some mechanical details of the Mercedes which de Palma drove may be of interest. The motor has a bore of 131.8 millimeters and a stroke of 180 millimeters, giving it a piston displacement of 599.2 cubic inches. In English units, the millimeter measurements given above are 5.2 by 7.06 inches. The carbureter is a Rayfield, while the magneto is of Bosch make of the two-spark type. The spark was set for 5-16-inch lead. The gear ratio on high is 1⅝ to 1. There is no direct drive to the car, power being transmitted through gears for any speed. The horsepower developed by the motor which is of four-cylinder type is 37 at an engine speed of 400 revolutions per minute and 90 at 1,650 revolutions. The pistons are of cast iron and are fitted with two rings each. At the top, these pistons have a clearance of .03-inch, at the middle .02-inch and at the bottom .015-inch.

Thomas Company in Receivers' Hands

Extension Notes Are Not Met and Big Buffalo Concern Is Thrown Into Courts—Resignations of Officials Now Before Creditors' Committee—Future of the Business

BUFFALO, N. Y., Aug. 31.—The E. R. Thomas Motor Car Co. is in the receivers' hands. The receivership of the Thomas plant resulted from action in equity brought by creditors on the grounds that the Thomas company, while entirely solvent, was temporarily unable to meet its obligations. Extension notes given at the time of the reorganization of the Thomas company a year ago could not be met at maturity. The notes, which totaled $250,000, fell due this year on August 1. The holders of $210,000 worth of these notes agreed to grant a 3-month extension but holders of the remaining $40,000 declined.

Judge John R. Hazel in the United States federal court here last Thursday granted an order appointing George C. Finley, secretary of the H. D. Taylor Co., and Adolph Rebadow, attorney, of the law firm of Rebadow & Ladd, receivers. The order provides that the receivers are to continue the business of that concern, and bond for the receivers was fixed at $50,000. Application for the appointment of receivers for the Thomas company was made by Charles B. Sears, of the law firm of Rogers, Locke & Babcock. The E. R. Thomas Motor Car Co. was represented at the hearing by William L. Marcy, of Moot, Sprague, Brownell & Marcy.

The E. R. Thomas Motor Car Co. succeeded about a year ago to the business of the E. R. Thomas Motor Co. when that concern was reorganized. The liabilities of the Thomas company today are said to be $960,000 while assets total $1,700,000.

Merchandise creditors of the Thomas company are to hold a meeting in the near future and it is anticipated that a reorganization of the company will be the result. At the meeting which probably will be held this week the receivers of the Thomas company undoubtedly will act on the resignations of Frederick R. Humpage, president of the Thomas plant; William L. Gleason, vice-president and general manager, and John J. Ramsey, treasurer. The resignations are said to have been tendered together, but authorities in the Thomas plant decline to give further statements on the matter until action has been taken by the company's receivers. President Humpage declines to state why he resigns from the concern, but probably will discuss the matter after the receivers' action.

Concerning the matter of the continuation of the business of the Thomas company, George C. Finley, receiver for the concern, has this to say:

"I am unable to say at this time just how long the business will be continued. The receivers have taken hold of it, and intend to put the business on its feet if that is possible. Of course, we do not know just at present what the exact conditions are in the plant. The permanent continuation of the business will depend greatly upon what we find."

The forces of the plant were reduced about 200 in number on Saturday, but the business will be continued if it is found possible.

SHOW AT INDIANA FAIR

Indianapolis, Ind., Sept. 2—A motor car show is being held at the Indiana state fair in this city this week. This is the first time there has been any elaborate display of motor cars at the fair, it being difficult in the past to secure sufficient space to make an attractive exhibit. The fact, however, that motor cars have rapidly displaced horse-drawn vehicles, has resulted in sufficient space for the motor cars and nearly a dozen firms are exhibiting. It is thought the display will attract much attention and result in many sales among the farmers, who are the fair's chief patrons.

The big pavilion of the Studebaker Corporation, used in past years for showing horse-drawn vehicles made by the company, is being used this year by five motor car concerns. These are: The Studebaker Corporation, showing its line of gasoline cars; the Hearsey-Willis Co., exhibiting the Hupmobile and Mitchell; the Cole Motor Car Co., showing the complete Cole line; the Premier Motor Mfg. Co., showing the full Premier line and the prairie schooner, and the Nordyke & Marmon Co., with its line of four and six-cylinder pleasure cars and light truck. The A. & M. Sales and Service Co. and the Finch-Freeman Auto Co. are exhibiting together in a tent, the former showing the Marion and American lines and the latter the Regal and Nyberg cars. The International Harvester Co. and the Staver-Chicago company are also exhibiting motor cars. The fair will close Friday night and an attendance of 250,000 is anticipated.

INDIANAPOLIS PLANS A POW-WOW

Indianapolis, Ind., Sept. 2—A national sales and advertising motor car conference and convention is being planned to be held in this city October 8 and 9, the idea having been suggested by J. J. Cole, president of the Cole Motor Car Co. Committees to arrange for the meeting have been appointed and are now at work on a program and inviting every motor car manufacturer and allied concerns in the United States and Canada to be represented.

It is thought that from 4,000 to 5,000 people representing the sales and advertising ends of the motor industry will be present. There is to be a mammoth banquet, and some of the best known advertising experts of the country will be on the program.

BROWN OUT OF MAIS COMPANY

Indianapolis, Ind., Sept. 2—With the completion of the reorganization of the Mais Motor Car Co., recently sold at receivers' sale, it is announced that Will H. Brown has retired from the company. Mr. Brown was president and general manager of the company when it went into the hands of a receiver. Mr. Brown, about 2 months ago, organized the Brown Commercial Car Co., of Peru, and is president and general manager of the company. He will devote his attention to this company and will have his office in this city. He is now in New York City for a short time and will return home soon.

ALCO TRANSCONTINENTAL TRUCK AMONG WYOMING GULLIES

Stephenson Company Appeals to Courts

Maker of Utility Truck Claims Pierce Motor Co. and J. I. Case Threshing Machine Co. Violated Agreement to Purchase His Plant—Suit Started in Milwaukee

MILWAUKEE, WIS.—Sept. 2—The Stephenson Motor Truck Co., of Milwau- ee, Wis., manufacturing Utility commer- ial cars at South Milwaukee, on Saturday, ugust 31, filed a suit in the circuit court t Milwaukee against the Pierce Motor Co. nd the J. I. Case Threshing Machine Co., Racine, Wis., chargin gthem with violat- g an agreement whereby the Pierce and ase owners agreed to purchase the plant of e Stephenson company for $100,000 worth the capital stock of the Pierce company. he trial will be transferred to Racine unty by mutual agreement and promises be most interesting. The official com- ainants are George L. Stephenson, arles Matthews, A. E. Halderman, ed M. Stephenson, Paul Durant and ederick Gettelman, and the official de- ndants are Frank K. Bull, Richard T. binson and F. Lee Norton.

The complainant charges that from the e of the alleged agreement, in January, 12, the Case company agreed to act as es agent for the Stephenson company til the Stephenson works were taken r on August 1, 1912. It is charged that defendants have refused to comply and t the Stephenson company, by reason discontinuing all of its own sales agen- s, and announcing to its patrons that it no longer selling its product directly, fered a great decrease in sales and now on hand a large number of motor icles which it cannot sell because of termination of its own selling outlets. t was stipulated, the complainant says, t if at the time of the purchase of the phenson company's plant, scheduled for ust 1, 1912, the assets amounted to less n $40,000, the difference was to be sub- ted from the amount of the capital k to be paid to the directors of the henson company, and that if the as- exceeded $40,000 in value, an addi- al amount of stock was to be added to consideration.

It is stated that the Stephenson company became affiliated with the Pierce and Case companies because of the desire to add commercial vehicles to the Case line of products, which includes Case cars, manufactured by the Pierce Motor Co., which is owned by the directors of the Case company.

STROMBERG OFFICIAL KILLED

Chicago, Aug. 30—J. R. Ballinger, for four and one-half years connected with the Stromberg Motor Devices Co., Chicago, was accidentally killed today, when the Lozier car, which he was driving from Chicago to Elgin for the road races overturned in passing another machine. At the time of his death, Mr. Ballinger was assistant to the sales manager of the Stromberg company. When he first took a position with the concern he was employed as stenographer, and had risen rapidly to his present position. He was 27 years of age. No successor has as yet been appointed.

UNITED MOTORS' AFFAIRS

New York, Sept. 4—Friday, September 13, is the date upon which the 90-day extension granted by the creditors of the United States Motor Co. will expire and before that date a plan of reorganization will be presented to the creditors and owners of the company. In fact, three different plans have been suggested to the creditors' committee and while official confirmation is lacking it is quite certain that one of the plans modified by suggestions of the merchandise creditors will be favorably reported. The first draft of this plan has been prepared but pending official action those interested decline to say anything about it.

Meetings of the committee have been held three different times within the past week and the announcement of the main facts contained in the plan may be expected at any time. It is understood that some additional capital is necessary and that it will have to be that one or more of the companies connected with the organization will have to curtail its production and that the 1913 manufacturing campaign, already well under way, will be conducted on conservative lines so as to avoid extraordinary calls upon the company's resources prior to the season when adequate returns are available, to meet such calls.

At the headquarters of the company it was learned that shipment of the 1913 product is continuing satisfactorily and, while all the officers are guarded in their statements, there is a feeling of growing optimism as to ultimate results.

On the New York curb a sharp break was scored in both common and preferred issues but later there was a good recovery, the net loss being only fractional. It was reported after the break that the selling pressure was by speculators, who had loaded up at recent lower levels and took profits on the subsequent rise.

RECEIVER FOR KING COMPANY

Detroit, Mich, Sept. 4—An order appointing the Union Trust Co. receiver for the King Motor Car Co. was given by Judge Tuttle in the United States district court here on September 3. It is probable that the plant will be sold within 2 weeks, although there has been no adjudication as yet. It is expected that the King company will shortly file a petition in bankruptcy which will clear up the case and permit of the quick sale of the plant.

KELSEY RESUMING

Hartford, Conn., Aug. 30—The manufacture of the Motorette, a three-wheeled machine, will be resumed next week by by the Kelsey Motor Co., successor to the C. W. Kelsey Mfg. Co., which failed some time ago due to its inability to get parts. The new company will manufacture its own motors and has changed from the two-cycle to a four-cycle motor of standard design.

SHOW AT MINNEAPOLIS

Minneapolis, Minn., Sept. 2.—Unexpected demand from the country for agencies is the interesting feature of the annual Twin City dealers' show in the grand stand at the Minnesota state fair, September 2-7.

ALCO TRANSCONTINENTAL TRUCK AMONG WYOMING GULLIES

Milwaukee's Meet Next on the Program

Badgers Set the Stage for the Grand Prix and Vanderbilt Races and Expect Fine Lot of Entries—France Decides to Put on Another Road Race Next Year—Sunbeams Enter 1913 Classic—Calgary's New Speedway Tried Out

MILWAUKEE, Wis., Sept. 3—The gaze of the motoring world, temporarily shunted to Elgin, has fallen back on Milwaukee, and from today until September 17, when the American grand prix, the first of the four international road racing classics, is pulled off, it will be the aim of the Milwaukee Automobile Dealers' Association, promoter of this de luxe edition of speed, to keep that gaze centered fast and hard on the big western city which heretofore has been reputed principally for its breweries.

Many Entries Promised

The line-up of entries up to September 1 shows more than thirty-five cars already in and money down. That there will be at least fifteen or twenty more is believed to be a foregone conclusion, as tentative entries already in the hands of Starter Fred J. Wagner are enough to cover this number. However, the Milwaukeeans are not figuring on anything where the money is not in sight and its guess of fifty-five contestants in four events is based on actual figures. Entries for the grand prix do not close until next Tuesday, September 10, while the books on the Vanderbilt, Pabst and Wisconsin Challenge will be open until Saturday, September 14.

Official practice on the Milwaukee course will not be permitted until September 11. Manager Ruddle has decided that the drivers can become fully acquainted with the course in a few days and there is no use in inviting conflict with the farmers by closing the public roads, if only for a few hours daily, until it is absolutely necessary. The course is so very close to the city that the chances are it would be crowded with spectators during the practice, these crowds growing as the length of the practice time is increased. This would necessitate a large expense for policing. Beginning Wednesday, however, the roads will be closed to travel from 11 o'clock a. m. until 1 o'clock p. m., giving the drivers 2 hours each day for from 7 to 10 days in which to figure out their race dope.

Hughes, manager of the Mercer team, will be the first to pitch his camp at the Milwaukee course. He has selected a fine spot near a graveyard for his tents and shacks, running the risk of being haunted by ghosts. The camp will be pitched before Thursday noon, according to advices from Chicago today. The other entrants will file in slowly during the present week. Manager Ruddle has provided thirty-five distinct camps along the course.

R. W. Saunders, who had the job of oiling the Savannah course last year and 2 years ago, is supervising the same work for A. B. Chamberlain, of New York, at Milwaukee. By Thursday afternoon every part of the course will be completed, save for the oiling, which Mr. Saunders figures can be finished up in 3 days thereafter. The rains during the last 3 weeks interfered somewhat with the progress of the course construction, but even with the slight delay the completion day will come well within the time limit prescribed in the bonds given by the contractors.

An interesting experiment is to be made by the Wisconsin state highway commission during the races. The course is composed of several stretches built of different materials, and the commission's experts will make frequent inspections during the races and a thorough examination after the last event to determine which kind of material has withstood the pounding of the heavy racing machines best. The information will come in good stead in the selection of materials for highway work throughout the state, as the roads rebuilt for the cup races are constructed under the approved formulae of the commission and are not special in any sense of the word.

Fowler Will Do Scoring

The four races at Milwaukee will be scored in the most modern way yet devised, the entire scoring system of the Elgin course being brought to Milwaukee intact. The M. A. D. A. has arranged with H. N. Fowler to handle this end of the game and the Chicago Automobile Club and Elgin Automobile Road Race Association have graciously consented to loan their fine devices to Milwaukee. The main board will be placed at the left of the judges' stand, as viewed from the grand stand, and there will be four other boards, one at each corner of the course, operated by wire from the main one, so that all spectators will be apprised of the standing of the contestants at practically one and the same time.

C. H. Warner, of the Warner Instrument Co., Beloit, Wis., has consented to supervise the electrical timing system, which is his invention and of his own manufacture. The horograph will be installed some time early next week and will be ready to do some timing in the practice work. The course will be accurately measured on Wednesday, September 11, and it is expected that the length will be approximately 8.215 miles, since two turns were cut away and one tortuous stretch straightened, making the whole circuit shorter than that at Elgin.

The M. A. D. A. has set a new pathway for other promoters to follow by taking out an insurance policy of $150,000 covering all liability for damages for personal injury, damage to property, and other risks that it assumes as promoter of the big meet. In this way every person viewing the races under proper credentials, viz., an admission tag, will be protected and the proceeding means, in fact, that the M. A. D. A. has taken out an insurance policy on every patron of the races.

Peugeot Cars Not Coming

Paris, Sept. 3—Special cablegram—After making all arrangements for participating in the grand prix of America, and even booking passages on one of the French steamers, it has been decided that the Peugeot team will not cross the Atlantic. The exact reasons for the decision have not been announced, but it is believed that in view of the small amount of business done in the United States the firm was of the opinion that the results would not justify the expense. One of the Peugeot grand prix racing cars has been entered in the Boulogne meeting, where it will run in the short distance races, and two big and two small cars will be started in the long distance road race at Le Mans on September 9.

ANOTHER FRENCH ROAD RACE

Paris, Aug. 20—In addition to the important official grand prix to be held next year by the Automobile Club of France under a fuel limitation rule of 14.1 miles to the gallon, it is intended to hold a long-distance road race for cars having a cylinder area of not more than 3 litres, or 183 cubic inches. This latter race is being organized by the newspaper L'Auto, and will doubtless have the same rules as those in force for the 3-liter class at Dieppe this year.

The date has not been fixed, but it is probable that the end of June will be decided on. There is every possibility of the hilly Boulogne course being selected for the holding of the race. The two races are in no way antagonistic. The Automobile Club grand prix, with its allowance of 20 liters of gasoline per 100 kilometers will unite cars of about 4 by 8 inches bore, developing 140 to 150 horsepower, whereas in the 3-liter class the average dimension will be 3.1 by 5.8 inches bore and stroke.

This race will be the third occasion on which cars have been run in France under the 3-liter rule and probably will be the last. The organizers of the race are of the opinion that three successive races are necessary to obtain full benefits from any set of rules; thus all the lessons having been learned as the result of the 1913

event, the following year the light-car grand prix doubtless will be held under limited gasoline rules with, in addition, a fixed allowance of lubricating oil for the distance to be covered.

CALGARY'S NEW SPEEDWAY

Calgary, Alta., Aug. 30.—When a bunch of millionaires—not the kind the papers talk about, but the kind that the banks will guarantee for seven figures, undertake to make a hobby out of a motor speedway, you can pretty nearly take it for granted that there will be a classy course.

Such is what happened in Calgary. Last year the Southeast Calgary Corporation, composed of some of Calgary's richest men, decided that they wanted something novel in their part of town. Daniel W. Trotter suggested a motor speedway. The company owned a stretch of prairie 6 miles by 2 miles. When Mr. Trotter got the idea that he wanted the speedway, he got it bad and he found an enthusiastic supporter in O. S. Chapin, himself the Alberta agent for the Overland car and a rich implement dealer. The other directors gave them a free hand and the Gridiron speedway, so named because they wanted it to be "the hottest spot on earth" was the result.

Just what the cost of that 4-mile straightaway track is, no on will tell, but it must have been $20,000. Mr. Trotter donned overalls and personally superintended the work. It was completed in 90 days and on August 10 it was formally opened and is now free to the motorists of Calgary. And there are many motorists in the hub of Alberta, which boasts of a car for every nineteen families.

Three records went by the boards when the track was formally opened. Barney Oldfield, Bill Fritsch and Lew Heinemann were the professional drivers invited to compete. All the motorists of Calgary were invited to try their speed and a card of sixteen numbers was arranged.

Oldfield drove his 300-horsepower Christie a mile in :41 4-5 on the first attempt. Then he sent the car against the ½-mile road record and was caught in :18 1-5. The speedway is not a prepared course but just an extra good roadway. Bill Fritsch then took the Cino a mile against time and was caught in :46 1-5.

HILL-CLIMB AT MOLINE

Moline, Ill., Sept. 2—More than 5,000 people lined the Sixteenth street hill this morning and watched Jack Stickney in a stripped Velie make the best time of the day, taking the free-for-all with a mark of 17 seconds flat. Stickney and Rose, both Velie drivers, carried off a majority of the honors, winning three firsts and a second. Oscar Priester of Davenport in a Pope-Hartford, won the Josephson cup in the amateur drivers' class, making the good time of 17⅕. The Pope-Hartford cars took second honors with two firsts and two seconds. Summary:

$1,000-$1,800 class—Rose, Velie, won; time, :20. Stickney, Velie, second. Time, :21⅘.

$2,000 and under, four passengers—Rose, Velie, won; time, :22. Only one entry.

Free-for-all—Stickney, Velie, won; time, :17. Only one entry.

Over $1,800—French, Lozier, won; time, :18. Peterson, Pope-Hartford, second; time, :18⅕.

$1,000 and under—Knowles, Overland, won; time, :21. Only one entry.

$2,000 and over, four passengers—Priester, Pope-Hartford, won; time, :18. Peterson, Pope-Hartford, second; time, :19.

Amateur class—Priester, Pope-Hartford, won; time, :17⅕. French, Lozier, second; time, :18⅕.

SUNBEAMS IN 1913 GRAND PRIX

Paris, Aug. 24—The first entries for the French 1913 grand prix race are three Sunbeam cars built by the Sunbeam Motor Car Co. of Wolverhampton, England. No other entries have yet been received, but no doubt is felt as to the possibility of obtaining the minimum number of forty cars before the final closing on October 31. The race, as already announced, will be run under a fuel allowance equal to 14.1 miles to the gallon.

WET TRACK STOPS MEET

New York, Sept. 3—A Labor day meet held on the Brighton Beach 1-mile track on Monday and which was scheduled to include seven events, was broken off after the fifth because Bob Burman declined to race on the wet track in his new 300-horsepower Blitzen Benz II. The other productions were a 5-mile match race between an E-M-F and a Bergdoll, the former, driven by Billy Burke, winning in 6:2.35; a 5-mile race between Stutz, White and Marion, finishing in the order named, with Stutz arriving in 5:16.61; the same Stutz and White cars and their drivers ran against Burman in his Ohio, which was disabled on the homestretch of the first lap, which race also covered 5 miles and was won by the White in 5:5.14; the first heat of a match race for the Remy brassard, between Burman in the Blitzen Benz, Hickman in a Mercedes, Kyle in the White and Grennan in another Benz, Burman going to a spectacular finish; a 25-mile race between two Bergdolls, a Marion, Stutz, White and Cutting, the latter driven by Burman and finishing in 25:28.56, beating the White by 12 seconds. The grandstand was filled fairly well.

REPORT ON RUBBER MARKET

New York, Sept. 2—Imports of crude rubber for the week ending August 24 amounted to 14,272 packages to which must be added 1,673 packages of waste, the whole valued at $1,768,000. The waste was valued at $59,000. Local trade has been quiet and, while the actual sales are said to be small, the volume of imports in connection with the steady market means that the demand is sufficient to maintain prices. This would argue in favor of a large general business. Prices remained about stationary throughout the past week, the level being at $1.20½ per pound for up-river fine.

Relation of Load to Chassis Weight

IN THE accompanying table are given the averages of the actual weights of American motor truck chassis of the various load capacity ratings, as supplied by the manufacturers of 325 gasoline vehicles and forty-nine electric models. Also, the means of the average weights, and for comparison, the average of the weights of from three to ten of the most successful makes of trucks on the market in each capacity rating.

For example, the average of the chassis weights of forty-nine different makes of 3-ton gasoline trucks is 5,509 pounds. To bear a uniform relation to the average weights of all other capacities, the weight should be 5,600 pounds. But the average of actual weights of ten well-known and successful makes of 3-ton trucks is 6,070 pounds, which exceeds the average of the forty-nine makes by 470 pounds, according to the figures.

Reference to the table will show that in most truck sizes the average weights of the selected few representative makes of gas trucks are in excess of that of all makes combined. The conclusion is that the companies that have had most experience rate their trucks lower or build them heavier and stronger than the new makers, or than those who have met with less commercial success. The table is given in the next column.

LOAD RATINGS AND CHASSIS WEIGHTS OF MOTOR TRUCKS

Capacity rating, pounds	No. of models reported on	Av. actual chassis weight, pounds	Means of all chassis weights, pounds	Av. weight of 3 to 10 leading makes, pounds
GASOLINE VEHICLES				
500-800	11	1,221	1,300	1,373
1,000	23	1,786	1,780	1,728
1,200	10	1,880	2,000	....
1,500	34	2,190	2,400	2,331
2,000	46	2,986	2,900	3,230
3,000	30	3,727	3,750	3,536
4,000	44	4,505	4,500	4,721
5,000	4	5,125	5,050	5,233
6,000	49	5,509	5,600	6,070
7,000	10	6,080	6,100	6,100
8,000	16	6,423	6,550	6,500
9,000	3	6,381	7,000	....
10,000	32	7,603	7,400	8,232
11,000	1	7,800	7,750	....
12,000	4	7,920	8,150	....
13,000	3	8,966	8,550	....
14,000	2	8,700	8,900	8,700
15,000	..	....	9,300	....
18,000	..	....	10,500	....
20,000	3	11,240	11,250	9,860
	325			
ELECTRIC VEHICLES				
500-800	7	2,375	2,375	2,540
1,000	11	2,755	2,750	2,700
1,500	3	3,518	3,300	3,350
2,000	7	3,525	3,800	3,716
2,500	4	4,270	4,300	....
3,000	2	4,124	4,750	....
4,000	6	5,592	5,600	5,489
5,000	..	....	6,250	....
6,000	1	7,000	6,900	7,000
7,000	4	7,439	7,400	7,851
8,000	..	....	7,850	....
10,000	3	8,438	8,700	8,438
12,000	1	10,000	9,500	....
	49			

Glidden Pathfinders Complete Work

Scouts Blaze Trail from Detroit to New Orleans—Distance 1,721 Miles

NEW ORLEANS, La., Aug. 30—The route for the annual national reliability run of the American Automobile Association has been completed, the pathfinders in the Flanders electric reaching the end of their journey last Wednesday after having traveled 1,721.7 miles from Detroit.

The pathfinding trip was not one continuous round of pleasure because of the unusually rainy weather encountered within 200 miles of New Orleans, but the hospitality shown the party throughout the entire trip made it a fitting forerunner of the A. A. A. tour in October. All along the line thousands of people greeted the scouts cordially and expressed hearty appreciation of the work being done. The mapping of a national highway from Detroit to New Orleans was very much worth while.

Exactly 28 days from the time of leaving Detroit the pathfinding car completed the long grind. The actual running time was 21½ days, however.

The advent of the pathfinding car spurred every community passed through with determination to improve the roads. Especially was this true in the south, and Kentucky, Tennessee, Alabama, Mississippi and Louisiana are states that will be immensely benefited by the tour.

The New York to Jacksonville tour last year was a fine one, according to Mr. Westgard, but the Detroit to New Orleans run will be far greater. Indianapolis, Louisville, Memphis, Jackson and Baton Rouge are some of the intervening points, and citizens of those cities are keenly alive to what the visits of the tourists will mean.

It remained for New Orleans to cap the climax in the way of lavish receptions. The local committee, composed of I. B. Rennyson, Jos. O. Schwartz and L. K. Nicholson, had arranged a banner welcome. The first car to welcome the visitors Wednesday morning was that of Abner Powell. He met the pathfinder about 4 miles out, but it was at the corner of Oak street and Protection levee in Carrolton that the members of the dealers' association and others were waiting for the visitors. At that point a procession was formed which passed down St. Charles avenue to the city hall, where there was a formal welcome by the mayor. Here Mr. Westgard presented the silk flag given him by Mayor Thompson of Detroit to Mayor Gorman. In accepting, the mayor took occasion to express the hope that the tour would give the good roads movement an impetus in this section. Mayor Gorman drank the health of the pathfinder in champagne and felicitated Mr. Westgard on the successful termination of his trip, which was started exactly 1 month ago.

Mr. Westgard and his companions reported a rough time out of Corinth, Miss. It was found necessary to straddle the levee for 6 miles out of the Mississippi town. The 117 miles between New Orleans and Baton Rouge were very disagreeable on account of the rains, which made it almost impossible to travel over some of the roads, there being no bottom.

There was a luncheon tendered the visitors at the Gunewald Wednesday afternoon, the hosts being members of the local dealers'-association.

CANADIAN REGULATIONS

Montreal, Aug. 27—In view of the steadily growing volume of motor tourist traffic between Canada and the United States, and vice versa, it is thought by local customs to be a fitting time for them to generally remind travelers of the rules and regulations to which they must conform if they wish to journey without inconvenience or delay.

For Canadian-owned cars going into the United States it was explained this morning by the official in the department of the chief collector of customs, the owner thereof must first ask permission from the local customs authorities to export his car for touring purposes.

When this has been done, the car owner will be supplied with two forms which must be made out in duplicate, giving name and address of owner with the name of manufacturer of the car, the manufacturer's number, the number of cylinders in the car, the style, seating capacity, color, style of running gear, with what extras, glass windshield and speedometer, together with the numbers of each of the tires, back and front, and other details.

One copy of the lengthy form so made out is to be given to the customs office at the last customs port on this side of the line, while the other is kept by the car owner until he returns to Canada, when it is given to the customs officer for purposes of comparison with the duplicate in his possession.

In the case of American tourists coming into Canada not only must conditions like the aforesaid be complied with, but each car owned must deposit the sum of $25 as a mark of good faith as well as a bond representing twice the duty collectable on the car. Thus, for instance, if an American car worth $5,000 comes into Canada and on a basis of 35 per cent is liable to pay $1,750 duty the owner must take out a bond for $3,500, with some guaranteed bond company. The bond expires and the $25 good faith money is handed back as soon as the American car leaves this side. If, however, an American tourist, coming into Canada, can produce two Canadians to sign a personal bond, the cash bond stipulation does not become necessary.

More than 500 cars, Canadian and American, have crossed the boundary line between this province and New York state since May 1 last.

MAKING DRIVING SAFER

Bloomington, Ill., Sept. 1—The La Salle Commercial Association has taken the initiative in a movement which may reach a climax in the legislature. It is proposed to put an end to the dangerous corners of the city and country streets and roads, passing a law, if necessary, prohibiting such corners. Many street corners are too

ARRIVAL OF GLIDDEN PATHFINDERS IN NEW ORLEANS

sharp, while many of the country road corners are marked by a dense mass of trees or shrubbery which hide approaching vehicles from view and thus invite accidents.

The La Salle association advocates the folowing: All street corners, instead of being square, as now, shall be given a radius of not less than 20 feet, so as to make a curve in passing from one street to another. No telegraph, telephone, lamp or other post, trees, shrubs or other obstructions may be placed within 20 feet of such corners. The corners of all country roads shall be cut back at an angle of 40 degrees, not less than 3 rods, and no trees, bushes or other obstruction to the view will be allowed to grow or be maintained within this angle.

RUNS INTO INSURANCE SNAG

New York, Sept. 2—The problem of motor car insurance, particularly as it applies to commercial vehicles, is still some distance from a solution. The matter was referred to James S. Marvin, assistant general manager of the N. A. A. M., for investigation and report and Mr. Marvin ran into an obstacle early in the proceedings. After conference with the insurance men Mr. Marvin found that the first element of information required from him by the insurance men was as to how long trucks are kept in garages and how long they are in service each average day. As such figures must be gained by a detailed canvass and as no such general detailed canvass has been made, the pursuit of that special line had to be postponed until such time as the figure should be available. Such a canvass will be undertaken in the near future to determine the time divisions in the life of trucks.

Illinois United in Good Road Cause

Down-Staters Launch Campaign to Improve the Highways

BLOOMINGTON, ILL., Sept. 2—Illinois motorists have launched a campaign in the interest of state roads and they will unitedly oppose the proposition to distribute the money accrued from licenses, among the various counties of the state.

There will be a battle royal in the general assembly over the method of disposing of the fund, estimated to reach $1,000,000 by July 1 next when the distribution is to be made. The owners of cars make the point that the idea of dividing the money among the counties would give each $10,000, thus improving a few miles with local benefit only. By lumping the sum and applying it solely for the construction of one state road, following the greatest line of travel, the state will contribute to the welfare and comfort of the many, attracting tourists from all the country.

It will be necessary for all owners of cars as well as others who favor the plan of building state roads first, to sound all candidates for the legislature and secure their views upon the subject. Commissioners of highways in most instances demand that the money be divided in proportion to the amount paid in, and will put up a strong fight in opposition to the state road plan. The motorists realize that the contest is no easy one and that it will require the earnest co-operation of every man who drives a car and all others interested in good roads, to win.

Secretary of State C. J. Doyle has just turned over to Secretary of State C. E. Russell $26,000, which represents a few weeks' accumulation of the motor registration fund and which brings the total on hand up to $400,000. This fund can not be disturbed until the next legislature passes a bill determining its disposition. As such a measure is not likely to take effect until July 1, it is predicted that fully $1,000,000 will be awaiting disposition, all received from motor car, motor cycle, and chauffeurs' licenses. The law requiring the collection of such license money failed to specify how it should be applied, except in a general way, that it must be used for the improvement of the public highways. The good roads committee, named by the last legislature, will submit a bill, specifying how this money shall be disposed of, but if it favors giving each county a small proportion, there will be a wave of protest and a demand for the centralization of the fund where it will show results.

Homer J. Tice, of Menard county, is chairman of the good roads committee. In discussing the need of road legislation, he said: "In the past 14 years, $60,000,000 have been spent upon the highways of Illinois, and statistics show that 37½ per cent of this sum has been expended without permanent benefit. This represents a loss of $22,000,000, while this is not a drop in the bucket compared with what has been lost in trade."

It is said that the Tice bill will provide for a state highway commission of three members, a state highway engineer and a county highway engineer, excepting that in the smaller counties, the county surveyor will act in lieu of a county road engineer. The measure will provide for the improvement of the main roads under the supervision of both state and county engineers and the improvement of the connecting roads under the supervision of the county engineers and township supervisors. The bill also will require the payment of all road tax in cash and the compulsory dragging of all dirt roads.

It is probable that the bill will be given extensive debate and probably receive numerous amendments before it finally becomes a law. The motorists want a state road between Chicago and St. Louis. When this is completed, they want another state road extending from Galena to Cairo. The third recommended will extend from Chicago to Rock Island, while the fourth will stretch from Danville to Quincy.

It is argued that these roads should be constructed in turn and that all contiguous counties should improve the laterals to connect their district with the main road. This in brief, is believed by the motorists to be the only satisfactory method of improving the highways of Illinois. Whether or not, they will be successful in convincing the members of the legislature, remains to be seen.

NEW ORLEANS CITIZENS AWAIT ARRIVAL OF GLIDDEN PATHFINDER

Routes and Touring Information

[illegible] ELEVATIONS OF EXCLAMATION POINT CAN BE SEEN FROM THIS POSITION WITH COLORADO SPRINGS AND THE PLAINS IN THE DISTANCE. THERE IS 1 MILE OF ROAD IN A 30-ACRE PLOT AT ONE POINT

Mountain Road for Motor Cars Only

IN the heart of the Colorado Rockies is a 30-mile motor car road, the last 9 miles of which is barred to other vehicles and which is claimed to be one of the world's finest scenic roads; there is no doubt of its being the very finest exclusive motor car road anywhere. It extends from Colorado Springs to Crystal park and makes a steady ascent of more than 2500 feet by a series of loops, bow-knots and switchbacks, a most remarkable piece of engineering. At one point, 7945 feet above sea level, a turntable has been built upon a rugged point, a device that saved thousands of dollars worth of road work. As it traverses one of the most rocky and precipitous regions, it was found necessary to blast the greater part of the road from the solid mountain side, while in order to perserve an easy grade, a succession of twists and turns was required which resulted in one place of the building of a whole mile of road in a thirty-acre piece of ground, probably the most crooked mile of road in existence.

The company which constructed this toll road is now operating a number of sightseeing motor cars, a battery of specially designed mountain-climbing Packard trucks, which carry almost a score of passengers each, and besides the daylight trips, make moonlight and searchlight excursions to Crystal park. The advantages of the motor car over the steam cars with their dust and cinders give this trip an added popularity.

The views along the trip are unsurpassed, wonderful vistas of mountain and valley, with the cities of Manitou and Colorado Springs spread out like toy cities far below. A point of historic and literary interest on this road is the rough cabin in which the late John Hay, secretary of state, sought seclusion while writing his famous story of the life of Lincoln.

The grades range from 2 to 8 per cent, although the latter grade extends for only the length of a city block. It was necessary to build it so in order to get around the mountain at a certain point called Sublime View; while the balance of the road runs from 2 to 6 per cent.

Construction work on the mountain section was commenced in the fall of 1909 and the road was completed, ready for operation October 31, 1910; the total time used in actual construction of the road was less than 8 months, which was remarkably quick work considering the amount of blasting through solid rock which was required.

The total mileage in making the round trip from Colorado Springs to Crystal park is about 32 miles, and the time consumed is approximately 3½ hours, allowing for a stop-over at the park of from 20 to 40 minutes. Fare is $2.50, but will be $3.00 next season.

Cars are run on a regular schedule, leaving Colorado Springs at 9 a. m., 9:45 a. m. and 1:45 p. m.; returning in the afternoon at 1:15, 1:45 and 5:45. Additional trips are made at irregular hours for special parties, and sunrise trips are made through July and August, leaving at 3 a. m. and returning at 7:30 a. m. On these trips the ascent is made by searchlight, giving the tourist a grand view of the Pike's Peak region by electric light, and stopping to view the sunrise at Point Sublime. There a panoramic view is obtained extending from below Fountain on the south, to Castle Rock on the north.

There are no villages or scattered habitations along the route, therefore, it is a purely scenic trip. It shows every point of interest in the Pike's Peak region, with the exception of the Seven Falls. The picture is continually changing, every curve bringing another and finer view to the sight of the traveler.

Unlike other mountain trips, in which the traveler is hedged in by canyons the greater part of the way, this road is in the open at all times. While the return trip is made over the same road, yet it opens up an entirely different series of vistas, and many tourists declare that the return is even more beautiful than the ascent. The cars run at the same speed going and coming, covering the mountain section of 9 miles in an hour. This not only makes for safety, but allows ample time to enjoy the scenery.

The cars leave Colorado Springs from the corner of Tejon street, and Pike's Peak avenue, and after calling at various leading hotels proceed up Colorado ave passing through West Colorado Springs on toward Manitou. At the Crystal junction, the private road begins and tends clear to the park and the Hay log cabin. The cost of building road and equipping it with a fleet Packard trucks with pullman bodies special construction, represents an ou of $150,000.

ROCK FORMATION AT CRYSTAL PARK, COLO.

There is no doubt that it compares orably with many of the most fam mountain roads of the old world, visi by thousands of Americans who fail realize the wonders of their own lan

MT. CARMEL TO TEXAS

Mt. Carmel, Ill.—Editor Motor Ag Please outline the following trips o the best routes:

1—From Mt. Carmel to Newport, A to Houston, Tex.

2—From Mt. Carmel to Red W Minn.—B. H. Kamp.

From Mt. Carmel to Mt. Vernon th is only one good road, which is by way Albion, and from Mt. Vernon the m direct route lies 63 miles through Walt ville, Sheller, Tamora, Pucknevville, nant, Cutler, Percy, Steeleville, Randol and Chester. Cross into Missouri a continue through Claryville, Lithiu

MOTOR CAR ROAD TO CRYSTAL PARK HAVING ELEVEN ELEVATIONS IN LESS THAN 30 ACRES OF MOUNTAIN SIDE

VIEW OF CAR ON WINDING ROAD TO CRYSTAL PARK

GATEWAY TO PARK WITH SNOWPLOW ROCK IN FOREGROUND

Perryville, Jackson, Allenville, Aquilla, Campbell, St. Francis, Ark., Piggott, Rector, Marmaduke, Paragould, Jonesboro, Cash, Pitts, Gubbs, and Newport. The following towns apply en route for Little Rock; Bradford, Russell, Bald Knob, Judsoula, Searcy, Beebee, Ward, Gabot, McAlmont.

Mostly good gravel roads are found en route for Hot Springs, 54 miles, through Collegeville, Benton, Fairplay, Lonesdale, Epps. Continue through Lawrence, Social Hill, Friendship, Arkadelphia, Dobyville, Okolona, Boughton, Prescott, Emmet, Hope, Fulton, Homan and Texarkana.

The best road to Houston from Texarkana lies first to Dallas through New Boston, De Kalb, Clarksville, Paris, Honey Grove, Bonham, Whitewright, Sedalia, Melissa, McKinney, Plano, Dallas, being 217 miles; between Dallas and Houston the itinerary lies through Lancaster, Red Oak, Waxahachie, Ennis, Corsicana, Mexia, Groesbeck, Marlin, Bremond, Franklin, Wheelock, Bryan, Anderson, Navasota, Hemstead, Waller, and Hockley.

SNOWPLOW ROCK ON CRYSTAL PARK ROAD

In going from Mt. Carmel to Red Wing, Minn., cross the Wabash river to Princeton and go through Patoka, Hazelton and St. Thomas to Vincennes. Princeton to Vincennes is 26 miles and to Terre Haute 63 miles through Bruceville, Oaktown, Paxton, Sullivan. Terre Haute to LaFayette is 84 miles over good roads through Atherton, Mecca, Rockville, Judson, Waveland, Crawfordsville, Romney, Elston, LaFayette.

To reach Chicago, 133 miles, the popular road lies through Montmorenci, Wolcott, Remington, Rensselaer, Aix, Virgie, Thayer, Shelby, Crown Point, Schererville, Highlands, Hessville, Gibson, Grasselli, East Chicago, Whiting, South Chicago, Bryn Mawr, Jackson Park, Chicago.

Routing to Lake Geneva takes you 82 miles through Oak Park, Addison, Ontarioville, Elgin, Algonquin, Ridgefield, Greenwood, Hebron, and Lake Geneva; Lake Geneva to Madison, 78 miles, is Delavan, Emerald Grove, Janesville, Edgerton, Staunton, McFarland, Madison. A day can be consumed in getting to La Crosse, 146 miles, routing through Ashton, Sauk City, Prairie du Sac, Baraboo, Abelmans, Reedsburg, Lavalle, Wonewoc, Union Center, Elroy, Kendalls, Cashton, Portland, Middle Ridge, Newburg, Corners, and La Crosse. Do not fail to take in Kilbourn, better known as the Dells of Wisconsin, which is a round trip of about 27 miles from Baraboo and reached through Lyons and Delton.

A route which offers the best roads and of course the longer lies through Crescent, Minn., Ridgeway, Witoka, Wilson, Lewiston, Utica, St. Charles, Dover, Chester, Rochester, Pine Island, Zumbrota, Zumbro Falls, Lake City and Frontenac to Red Wing.

The shorter route is the more scenic and advisable if after careful inquiry at Witoka and Winona, road conditions are found favorable. You will thence proceed along the river through Rolling Stone, Minneiska, Kellogg and Wabasha, Lake City. On this latter road, there is a sandy stretch between Minnieska and Kellogg, and Frontenac and Red Wing.

ADRIAN TO FORT WAYNE

Jasper, Mich.—Editor Motor Age—I would like a route from Adrian, Mich., to Decatur, Ill., via Dayton, Ohio, and

LAST STRETCH OF UPPER GRADE TO PARK

TURNTABLE FOR MOTOR CARS ON MOUNTAIN ROAD TO CRYSTAL PARK

return through Ft. Wayne, Ind.?—Tourist.

Route to Lima through Madison, Jasper, Lyons, Winameg, Ottokee, Wauseon, Napoleon, Defiance, Lima. If you want to go by way of Toledo from Wauseon the routing is Delta, Crissey, Toledo, Waterville, Haskins, Bowling Green, Findlay, Mt. Cory, Bluffton and Lima, which of course is considerably longer.

A good gravel or macadam road takes you to Dayton, a distance of 77 miles, through Cridersville, Wapakoneta, Botkins, Sidney, Piqua, Troy, Vandalia and Dayton.

Indianapolis is reached through Kingsville, New Lebanon, West Alexandria, Eaton, Westville, Richmond, Centerville, Germantown, Cambridge City, Strawn, Dunreith, Ogden, Knightstown, Cleveland, Greenfield, Cumberland, Indianapolis.

A very good road extends through Crawfordsville and Champaign, the intermediate towns being Clement, Brownsburg, Liston, Jamestown, New Ross, Crawfordsville, Waynetown, Hillsboro, Veedersburg, Covington, Danville, Homer, Urbana, Champaign, Monticello and Decatur.

For the return trip go to Champaign and then Urbana, Danville, Covington, Stone Bluff, Attica, Shadeland, Elston, Lafayette. A good gravel road to Fort Wayne, 134 miles, is through Buck Creek, Americus, Delphi, Camden, Deer Creek, Logansport, Peru, Wabash, Huntington and Fort Wayne; and the home stretch Maysville, Hicksville, Defiance, Okalon Napoleon, Wauseon, Ottokee, Winame Lyons, Jasper and Madison.

THE SKY LINE IS THE GATEWAY TO CRYSTAL PARK, REACHED AFTER NUMEROUS TURNS AND SWITCHBACKS ON EXCLUSIVE MOTOR CAR ROAD

The Readers

Discussion of Relative Merits of Friction and Sliding Gear Drive Systems—Good Suggestion Made for Body Alterations for Extended Country Touring

Status of Friction Drive

Efficiencies and Deficiencies of Transmission Types Discussed for an Inquisitive Buyer

AUGUSTA, Ill.—Editor Motor Age—I am thinking somewhat or purchasing a car. Have the merits and demerits of friction transmission been discussed recently in the columns of Motor Age?—J. G. Whetstone.

The claimed merits of the friction type are: unlimited range of gear change, ease of operation, variable friction, simplicity, fool-proof qualities, and silence. The features of this type that have received the most criticism are: great end thrust necessary to obtain the required amount of friction, the necessity of using chain drive, the reverse action of the friction pedal to the usual clutch pedal, frictional losses in transmission, lack of direct drive on high, cumbersome size and location.

That the first advantage is of undoubted value is to be seen in the present agitation for four-speed sliding gearsets, in the contention that three are not enough. That the second also is a feature of importance is evidenced by the emphatic opposition of many drivers to this change on the grounds that the four-speed gearset is too complicated and hard to manipulate. Variable friction is of some value, as with very light friction a car with this form of drive is unquestionably the easiest to handle in traffic. Here might also be mentioned the ease with which the friction car may be reversed for turning, or quick maneuvering in crowded streets. The advantages of simplicity in itself are self-evident. That the friction type is foolproof is not to be doubted, although this type is as susceptible to expert operation as any, and so handled, will show increased efficiency. Its silence is an indisputable advantage in favor of the friction type over the sliding gear.

But all good things have faults. The faults most glaring in the present development of the friction transmission are: Due to the small area of adhesion A, in Fig 1, great pressure must be exerted to bring the friction surfaces together. This pressure falls on the bearings at B1, B2 and B3. In recent developments, thrust bearings of the ball type have been placed at B1, and annular ball bearings at B2 and B3, which serve to neutralize this to some degree; but the pressure still exists as an inherent disadvantage of this system. Various attempts have been made to lessen this fault by using a multiplicity of disks and wheels, but these have not been, so far, applied to pleasure vehicles; with one or two exceptions, in cars no longer manufactured. Such applications of the friction principle have been made on commercial cars, where the conditions of service made the increase of friction area inevitable, but such devices are of such cumbersome and bulky nature as to preclude their use on pleasure vehicles. In view of the popular preference for shaft drives, due to their silence and cleanliness, the chain drive necessitated by the disk and wheel type of transmission is to be considered, from a mercantile standpoint, a drawback to this type, although with the silent chains and chains in oil used commonly with this type, there is no real foundation for this prejudice. The usual order of pressure on the pedal to release the clutch and release of pressure to engage it, used on sliding gear cars, is reversed in the friction type, a ratchet pedal being pressed forward to engage the friction, the pressure being variable, and the pedal locking at each position, it being necessary to touch it with the toe to release it and unclutch the engine from the drive wheels. This is awkward for the driver of gear-driven cars, but when once accustomed to this arrangement, no trouble is experienced.

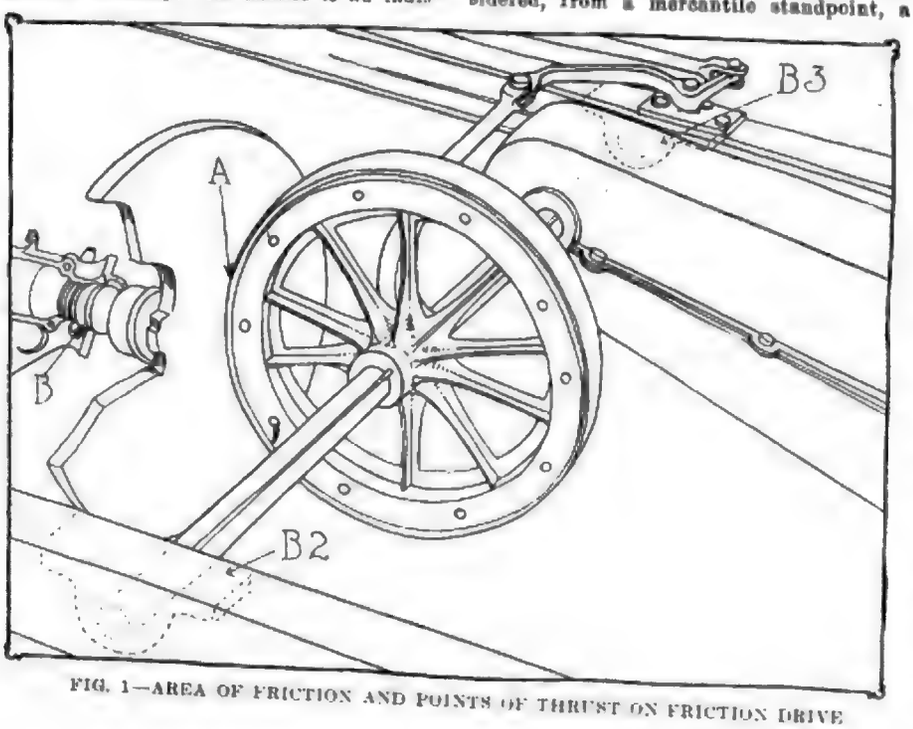


FIG. 1—AREA OF FRICTION AND POINTS OF THRUST ON FRICTION DRIVE

It is true that on high gear the direct drive of the gear type has an economical advantage over the friction type, and that owing to the fact that the disk and wheel contact is not a true rolling contact, power losses on its lower gears are great. This objection is met with the fact that owing to the limitation to three or four steps of ratio, the adaptability of the gear drive to any certain load condition, is at best but approximate, as the gear ratio required for any two conditions is seldom the same; while the thousand speeds of the friction drive permit a skilful driver to select the exact ratio required by every change in the conditions of running. This is borne out by the difficult feats in the way of hill climbs, stair climbs and negotiations of curbs and ditches by the demonstrators of cars using this type of transmission. But the fact remains that direct drive with this type is unattainable, and as most of the driving is done on direct, with gear drive, the charge against the friction type in this particular is grave.

In regard to the shape, size and position of the friction transmission, this is perhaps the chief drawback to its use. It takes up a large amount of room, as its efficiency depends to a large measure on its size. It must be mounted amidships of the chassis, and for this reason it is put under the front seat, preventing the use of this space for stowage. Its excessive diameter, too, obligates the designer to carry his body rather high in order to keep his seats low enough for comfort and yet maintain sufficient clearance.

This problem has been discussed pro and con for many years by the leading motor

Clearing House

Many Reasons Why Motors Overheat—Should Decarbonize Weekly—Carpenter Describes Ideal Tool Equipment —Police Chief Amends Mistaken Statement

engineers, but with no apparent agreement, and it seems certain that there is much merit in this principle of drive. The forms that have been applied to motor cars have been reported as very successful; but the complete solution of the transmission problem is yet to be made. This type of design is in many ways analogous with air cooling, the two-stroke cycle, and front-wheel drive, alike based on uncontrovertibly sound principles, but each tried and abandoned by the majority of designers for the standard practice in their respective fields. Whether some day a renaissance in motor car design will revive these features and place them on the dias of standard design, remains to be seen.

OVERHEATING CAUSES LEGION

Memphis, Tex.—Editor Motor Age—1—How does one connect the batteries and magneto of a 1909 Cadillac on the magneto coil, doing away with the battery timer and coils?

2—Why does my 1911 Ford heat to the boiling point when it runs about 2 miles? When I cut down the fuel it has no power. I have tried it with the spark lever at all positions, but to no effect, and when I cut down the fuel, as stated above, it has no power. I have just given it a thorough overhauling. Is the trouble caused by the carbureter?

3—Why cannot I get the noise out of on E-M-F differential, or drive pinion and bevel gear. I have tried adjustments, but to no effect.—C. E. Rawlins.

1—The Cadillac company did not intend that the car should be wired in this way, and strongly advise against it. It may be done, however, if a Remy low-tension magneto with a non-vibrating coil is used, by wiring the battery to the magneto distributor, inducing the current in the non-vibrating coil. This will do away with the timer and vibrating coil, but why these members should be eliminated is not clear. It is certain that a coil intended for a magneto current is poorly adapted for use in connection with batteries. With any other than a low-tension Remy, or a specially built Splitdorf, designed especially for such use, this may not be done, and the advice of Motor Age is to follow the advice of the maker as to changes of this nature.

2—There are almost as many possible causes for overheating in any motor car as there are parts to the motor. With no more definite information than is given in the question, Motor Age cannot do more than enumerate the most frequent causes of overheating in a gasoline engine. Assuming that the cooling system is in good repair, and that it is kept full of water, that circulation in all portions of the radiator and jackets is complete, and that the passages are kept clean and free of scale, the most common cause of cooling trouble is poor carbureter adjustment. The carbureter should not be blamed, however, until it is definitely ascertained that the trouble cannot lie elsewhere. This being established as certain, the carbureter should be adjusted to run the engine with the minimum of mixture density, i. e., as lean as possible. If the carbureter is correctly designed and in good repair, correct adjustment in this direction should cause the motor to deliver its maximum power. If, on the contrary, it shows a loss of power, when the mixture is thinned, the trouble is with the carbureter itself, rather than its adjustment. See that the float is in proper order; that the needle valve seats properly, and that the air valve opens as it should.

Before touching the carbureter, however, the spark timing should be inspected. See that it advances correctly, and observe in your driving whether or not you are carrying it sufficiently advanced. Examine your lubrication, remembering that a little smoke in the exhaust is better than a hot motor, and decarbonization is an easier and cheaper repair than that of a siezed piston or a burned-out bearing.

3—Before attempting to eliminate noise in the rear axle gears, the location of the sound should always be determined. If it is in the differential it will occur only when rounding a curve or when one wheel is slipping. If it occurs at all times of running, it is either in the bearings or in the driving gears. It is, of course, superfluous to suggest that the lubrication be made sure of. There is but one adjustment on the E-M-F rear axle assembly, that of the driving pinion. This may be moved forward or back by means of a screw collar. If the noise continues regardless of any position of the driving pinion, there must be a defect in the gears, which should then be replaced; or a misalignment, which should be taken care of by a competent expert. The best plan, in this case, is to send it to the factory.

Design for Motor Pullman

Western Motorist Outlines Design for Touring Car Independent of Hotel Accommodations

OKLAHOMA City, Okla.—Editor Motor Age—I have endeavored to find some design for a touring and camping body for the motor car that would not add weight or bulk, yet have the convenience so desired by the camping and touring public; a car so arranged that the home comforts can be had within the body, avoiding the carrying of tents, camp chairs, camp beds, and the frequent necessity of living upon the damp ground while enjoying the wild woodlands near some remote lake or stream. I enclose a rough sketch of a body for consideration.

The above sketches are aimed to outline a body extending over the trunk racks as they are now in use, the lower part thus enclosed to be used as a clothes closet, the upper portion for a gasoline stove and utensils, the seats to be as usual but the backs to drop back to the level of the seats, thus forming a bed similar to a pullman berth, all cushions removable for convenience of the room.—B. R. Harrington.

In Fig. 3 is shown an elaboration of Mr. Harrington's sketches which to some extent conveys his idea with Motor Age's suggestions added. Sketch 2, illustrates the appearance of the interior of the car ready for the road, the combined wardrobe and kitchen occupying a space behind the rear seat. The front seat is arranged so that its back may be tipped backward, the back of the seat having a slot in it of the shape indicated in sketch 1. To lower the back of the front seat first press down on the back to release the pin in the slot shown in 1; then raise the back until the pin slips into the end of the slot and then lower the back until it rests on the rear seat. The back of the front seat travels on a pin protruding from either side of the body, the head of which is inserted in a slot. This pin locks at either position by slipping into the end of the slot. The back of the rear seat lifts up and can be placed on the top of the rearward extension of the body which forms the kitchenette and wardrobe.

The bed is formed by the front cushion, the back of the front seat, and the rear cushion as shown in 4. Entrance to the kitchenette is given by placing the back and cushion of the rear seat on top as shown in 5, and then lifting up the rear seat boards which are hinged at one side. The shelf in the back is cut away enough to allow the door of the wardrobe to open. The appearance of the car is illustrated in Fig. 2.

In the case of a car having no excess of wheelbase, this plan would probably be the best, as the construction shown in Fig. 2, if adapted to any but a long wheelbase, would involve much unsightly

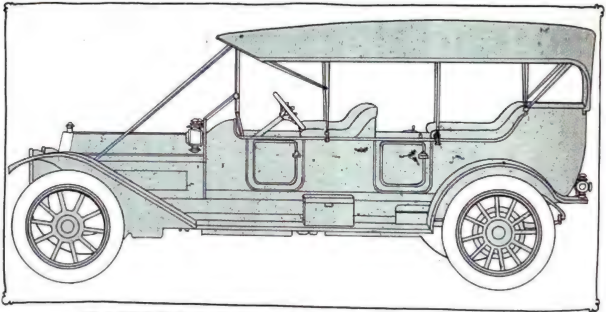


FIG. 2—DESIGN BY MOTOR AGE FROM B. R. HARRINGTON'S SUGGESTION FOR CAMPING BODY

overhang, that with a dummy touring trunk would not have as awkward an appearance.

MEANING OF FACE DIAMETER

Nyack, N. Y.—Editor Motor Age—In Motor Age of November 16, 1911, is given a description of the engines of the Sizaire-Naudin and Hispano-Suiza cars.

If it is desired the rear extension, housing the stove and wardrobe make be made to have the shape of touring trunk; this latter arrangement could be used easily in refitting an old body in this way.

In this description it is stated that the face diameters of the valves are respectively 55 and 60 millimeters. I would like to know whether by face diameter, is meant the clear diameter or the large diameter, as I have never seen the expression face diameter used in giving valve dimensions.

I hope Motor Age will publish more descriptions of high-efficiency motors for light foreign cars, as I consider their design to contain many details which will be incorporated in larger cars of the future. —Edward G. Ingram.

The face of a valve is the surface next the interior of the cylinder. The face diameter is the diameter of the beveled openings in which the valve seats, that portion of the valve, which is encompassed by this opening, being the face.

VIBRATOR EXHAUSTS BATTERIES

Martin, Mich.—Editor Motor Age—I have an Overland 59-T, and have had three sets of batteries since April and cannot find the shortage. I do not run on the batteries and cannot start when they run down to 5 amperes or less, neither can I start on magneto. After pressing the switch so that it would rub tighter I could start on magneto.—L. H. Bender.

1—Your trouble is in all likelihood with the adjustment of your vibrator. It is probably adjusted too stiff, so that it consumes an excessive amount of current, and will only act when your batteries are in good condition, the strength of a 5-ampere current being too little to overcome the resistance of the spring. The vibrator should be adjusted as soft as possible for economical running and easy starting. While adjusting this part, it is always well to make sure of the condition of your platinum points. There may be a short circuit in the switch if the vibrator is not at fault.

TOOL KIT FOR TOURING

Sauk Center, Minn.—Editor Motor Age—I will give a list of the articles which 8 years of experience has taught me that I must, to avoid mind-worry and possible loss of the higher realms of pleasure after death, carry in the tool box of my car, I now hear some one say: "What an old fudge." This kit, however, has saved me ten times its cost, which is quite large, and I never have been pulled in since I sold the big freight-car some years ago.

Here is what I have in one box: One big monkey wrench, one small monkey wrench, one adjustable off-set wrench, one Elgin wrench, three S wrenches with different size openings; a set of socket wrenches with universal joint and ratchet handle, one jack, one small riveting hammer, one ball-peen hammer, two cold chisels, four punches of different sizes; one pair of pliers, one cutting nipper, five extra spark plugs, three tire tools, one clamp, one flat file, one triangular file, one round file, piece of asbestos, one valve lifter-spring, twelve extra insides for inner tube valves, one box cotter pins, one box assorted nuts, one box assorted rivets, six assorted taper pins, one pump assortment steel balls of the kind used in car, small coil of best annealed steel wire, a spark plug wrench, a coil of insulated primary wire; one piece of sandpaper, some waste, extra wire belting for pump, small jeweler's file, one box of assorted cap screws, a few assorted sized bolts, a piece of harness leather, one can flake graphite, valve grounding compound, a few assorted nails, a strip of belt lacing, small screws, funnel, tire gauge and a strainer for gasoline.

In my next box away from these articles spoken of, are to be found properly placed to avoid damage, three inner tubes, two blow-out patches, four outside leather sleeves, one steel linked outside tire clasp, one package French chalk, one voltmeter and one ammeter, chamois skin, some cotton cloth, one bottle diluted carbolic acid for cuts or bruises on hands. In my next compartment are an extra storage battery, fully charged; a can of grease, one can of lubricating oil, one can of gasoline. These go to make up a very complete set or kit of tools, etc., which makes your trip much more pleasant and care-free, and behind it many bright dollars. I can almost assemble a motor car with this outfit, and many times in helping some thoughtless motorist I have taken a plunge right into this outfit and brought forth just the thing he wanted.—A. D. Carpenter.

HOW OFTEN TO DECARBONIZE

Jasper, Mich.—Editor Motor Age—How often should carbon be removed from an engine? I mean in regard to the number of miles.

2—Will kerosene, if put in the cylinders over night, be of any real value as a carbon remover without the use of scrapers made for that purpose? If so, is there any need to drain the crankcase of cylinder oil to keep the kerosene from

mixing with it by soaking down past the piston rings?—Tourist.

1—On an average machine, in use on an average of 30 miles per day, the cylinders should be cleaned out with kerosene once a week, or every 200 miles of running.

2—If kerosene is put in the cylinders at night and the motor turned over several times to get the oil well spread over the surface, it should be left over night, and the motor run next morning to burn it out. The exhaust will be very smoky until the kerosene and carbon have been burned. The oil should be drained out of the crankcase after each decarbonization.

BRASS POLISH FOR MOTOR CARS

Detroit, Mich.—Editor Motor Age—Please give me a recipe for a good brass polish.—E. C. Walson.

A polish that is easily compounded at home is made in the form of a paste of equal parts of sulphur and chalk, with sufficient vinegar to reduce it to the required consistency; apply it with a soft cloth, while moist, rubbing it off and polishing, when dry, with a piece of chamois. This is but one of many, being recommended for its simplicity.

A more complicated formula is: 80 per cent alcohol, 100 parts; olien, 50 parts; tartaric acid, 80 parts; tripoli, 30 parts. Mix the tartaric acid—in powdered form—with the alcohol, whereby the acid is partially dissolved, then add the olien, and finally the tripoli, taking care to mix thoroughly.

There are many more formulæ for this class of polish, but the above will give very good satisfaction.

POLICE CHIEF MISQUOTED

Atlantic City, N. J.—Editor Motor Age—In the article on "Traffic Rules for Smaller Cities," in Motor Age for August 8, I am quoted as being the only one to vote against the rule of slow-moving vehicles keeping to right curb. That was a mistake made by the clerk evidently, as I never was in doubt but what that is one of the most necessary rules. I think the Kansas City ordinance good. But some of its regulations would be unnecessary here. I think you are doing a good thing by trying to get as near uniform regulations as possible all over the country.—M. B. Woodruff, chief of police.

FORD TROUBLES EASILY REMEDIED

Sturgeon, Mo.—Editor Motor Age—I have the care of 1910 and 1911 model T Fords. Last summer the 1910 model was run dry and three bearings were burned out. Since then it has been using a great quantity of oil. After running 4 or 5 miles the engine misses. If the plugs are cleaned it will then run well for only a short time. The compression seems good and it has plenty of power so long as it runs on all four cylinders. This model has a partition between the magneto and the crankcase. If this partition were taken out would it stop the use of so much oil? If not, will Motor Age suggest a remedy?

2—In the 1911 model the motor begins bucking if the car is slowed down to 7 miles an hour on high. Last summer I had a Kingston carbureter on it. It now has a Holley carbureter and the valves have been ground and the engine given a general cleaning. After that it ran well, especially on the magneto which it had not done before; it would run 5 miles an hour on high and never buck. When the gasoline tank was filled another grade was used and now it will not run good at all. If the spark control is set in the fourth or fifth notch it runs all right, but if moved out of the notches it will shoot like a blank cartridge pistol and then stop. This stopping occurs only when it is running on the magneto. If it is switched on to the batteries the spark may be pulled out of the notches and the motor will still run. Will Motor Age tell me what is the cause of this stopping and state a remedy for it?

3—Is there any preparation on the market to put on faded top linings?—James Lile.

1—Cut out the partition and the spoons on the lower ends of the connecting rods entirely, then carry your oil level as high as possible without smoking. It may be necessary to carry this level as high as the upper pet cock of the crankcase. This is the only remedy Motor Age can suggest if the cylinders, pistons, and piston rings are in good condition. If not, the defective parts should be repaired or replaced.

2—The first trouble is evidently with the gasoline. Have it strained through a chamois, to exclude water and foreign substances. Your carbureter probably is adjusted for a higher grade of fuel than you now use. The second trouble in all likelihood is the result of a short circuit in the commutator wiring, which is the result of bare or damaged points on the insulation, which touch on all spark positions but the one to which you refer. That such a fault has not been before discovered is due to the fact that it is not a direct short circuit, there being probably a layer of dry or oil-soaked insulation to deceive the observer, which exerts a sufficient resistance to prevent serious leakage of the relatively weak battery current, but cannot contain the magneto current. Renew these wires and your trouble will probably cease.

3—There are several preparations on the accessory market of this character, although any water stain will do the work. One of them is made by the Rub-On Varnish Co., Buffalo, N. Y.

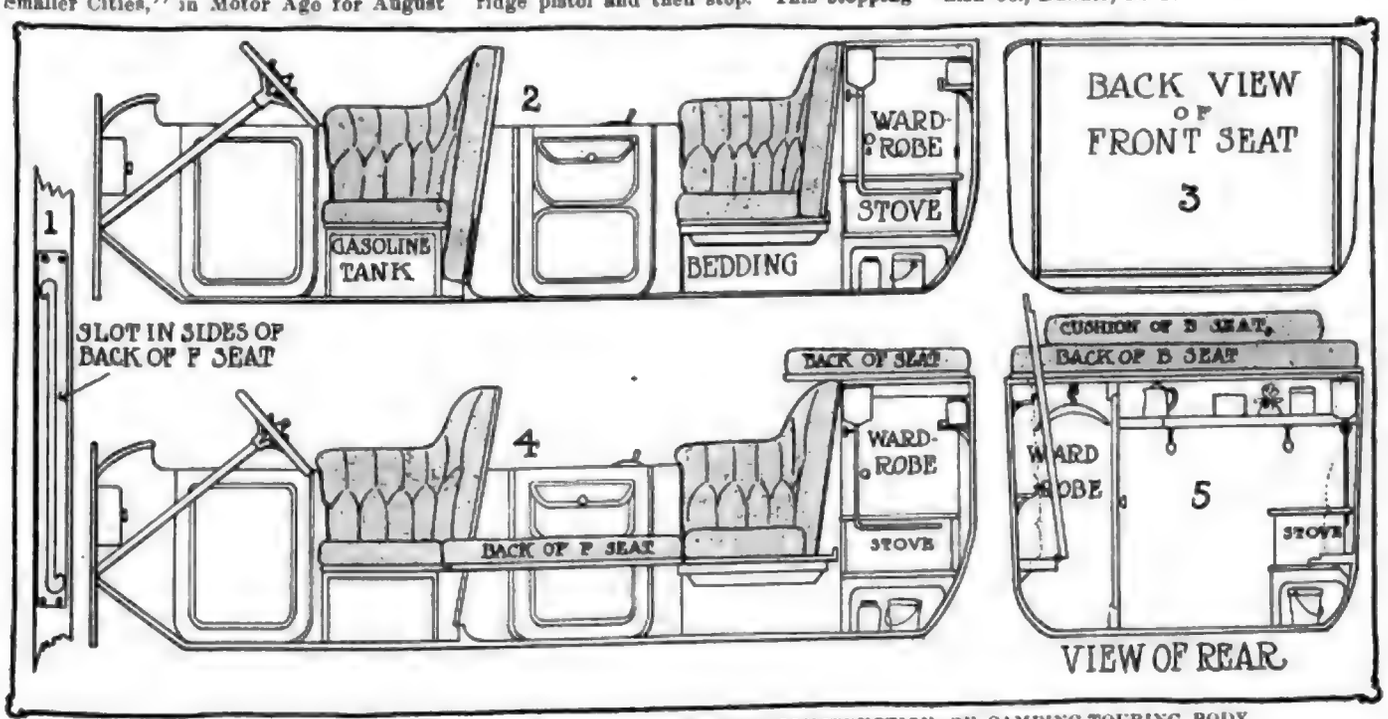


FIG. 3—SECTIONS SHOWING INTERIOR ARRANGEMENTS AND CONSTRUCTION OF CAMPING-TOURING BODY

Jig Is Carbureter Makers' Trump Card

FIG. 1—CARBURETER BODY JIG

This jig is an irregular six-sided metal framework to hold the casting, which is anchored by the piece L. The jig serves for six different operations, all of which are carried out by the eight-spindle drill, which is in reality two four-spindle drills coupled together. The drill D is shown in one drilling operation

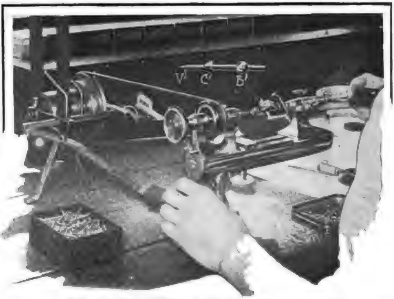


FIG. 2 WATCHMAKER'S LATHE IN CARBURETER WORK

This lathe is used to turn the point V of the gasoline needle valve, shown in actual size in the upper part of the figure. The alloy steel cone C is ground and is the only ground part in the carbureter

Great Mechanical Precision in Manufacture of Parts and Uniformity of Production Attained Through Use of Templet—Process Employed by Wheeler & Schebler

PRODUCTION is the battle cry of carbureter makers today. The carbureter maker must produce in hundreds daily, one maker producing 500, another perhaps 800 and another 1200 or more. They all manufacture for high-tensioned car builders, builders who must have their carbureters on time at any cost. One car maker refuses to use a certain make of carbureter on his cars because he must have a shipment by noon Saturday and the maker cannot supply them until Monday morning. A day is a short time but it is enough to change an order.

Production Uniformity Necessity

But the carbureter maker is up against other factors than mere production, he can accomplish that. Additional buildings can be erected, new machinery installed, more help hired and the problem is solved, were that all. But it is not: uniformity in production is the big goal to be aimed at. Carbureter parts must be interchangeable, in a word, they must be standardized. The part that fits one carbureter must fit equally well any of the 1,000 others that are produced the same day, any of the 6,000 others produced the preceding week or any of the 25,000 others manufactured the previous month. This interchangeability is the big problem.

Jig Secures Interchangeability

In manufacturing there is only one way to get interchangeability and that is by using the jig. The jig is applied science in the hands of the ordinary artisan. Give a carbureter bowl or float chamber to a workman and ask him to drill six holes in it at different parts, in different directions and of different sizes. Set another workman at the same job with another float chamber; do likewise with a third, a fourth, a fifth, a sixth and etc. What will be the result? Not any two will measure the hole location with the same degree of accuracy. Not any two of the six holes will be drilled exactly alike by the different workmen. When such carbureters are being assembled they will not go into place properly, they will not be properly assembled and when sold they will not give that performance they should. It will cost the manufacturers more to keep his customers pleased than to make carbureters properly.

The jig makes it possible to manufacture so that all parts in 100,000 different carbureters will be interchangeable. The jig makes it possible to hire a new man Monday morning and have him do as good work as the workman who has been on the job for several seasons. With the jig it is almost impossible to do a thing wrongly. With a jig there is only one way to do the thing and that is the right way.

Wheeler & Schebler Process

Fig. 1 shows a workman using a jig in the Wheeler & Schebler carbureter factory at Indianapolis. The jig is the irregular-shaped metal frame work J in which the carbureter body part is placed. The carbureter part slips readily into it and when in is locked therein by a set plug L. A turn or so of this forces it down on the carbureter part, locking it. If the carbureter part is not properly in place in the jig it will not lock it so that the workman cannot err. There is only one way in which the part can be put in the jig and he learns that in a few minutes. This jig is known as the big body jig and is used for six operations on this part. The operations are drilling holes in the castings and threading them. Wherever a hole has to be drilled in the casting there is a hole in the jig and it will be

seen that the drill D is boring or drilling a hole in the casting as indicated by the dotted lines, this hole being where the needle valve in the nozzle works. There is in the top of the jig a hole through which the drill D passes. This hole is bushed with a hardened steel bushing, the correct size for the drill D. A larger drill would not enter, a smaller drill would not work properly, thus there is only one and that the right one. All the workman has to do is place the jig on the base of his machine, do this with the left hand, and bring the drill D into operation with the right hand. He cannot do it otherwise than the right way.

Operation of Big Body Jig

When this hole is drilled he slides the jig with its casting along to the next spindle at his right, turning the jig over to another bushed hole and drills or taps the other holes as needed. Thus the workman goes from one end to the other of his eight-spindle drill and performs in all six different operations on this part without making a single error or having to use a rule or calipers or anything else to measure where the holes should be drilled. The jig does it all for him and prevents him making errors. A single workman with such a machine will handle hundreds of castings of this nature per day, his capacity as a factor in carbureter production is readily seen. The six operations are drilling and tapping.

Fig. 3 shows another jig J in which the piece P is anchored, almost hidden inside the jig but reproduced outside the jig at the lower left to show its shape and appearance before being put in the jig. This piece is the cam for varying the lift of the needle valve with different throttle positions. Eight operations are done on this while it is in the jig. It has holes drilled in it, it has these holes reamed out or made smooth and it has some of them tapped or threads cut on them. The drill is shown at H2 cutting one hole; at H1 is a bushed hole where another hole will have to be drilled; W is for anchoring the part P in position.

Fig. 4 gives an excellent example of jig work in the Schebler plant. Here are five different jigs, each having inside it the piece to be worked upon, and each having in front of it the piece before it was put through the jigging operations and also the piece after put through the jigging operations. In part No. 1 is the float lever having had two operations, drilling at 1 and also at 2. In the jig are two holes where the drill enters for these operations.

At part No. 2 is the throttle lever jig, with the throttle lever part in it. The pieces in front show the two drilled holes 3 and 4, holes at right angles to each other, to do which the workman must turn the jig on his machine. The bushed opening for drilling the hole 3 is seen in the near side of the jig.

Part No. 3 shows the flushing lever bracket which has two holes 5 and 6 drilled in it and then reamed, making four operations in all. These holes are at right angles, calling for turning the jig by the workman between operations.

In part No. 4 is the cam casting jig already referred to and illustrated in Fig. 3. The four holes to be drilled are designated 7, 8, 9 and 10. There are in all eight operations, as each hole has to be reamed after being drilled.

Hinged Type of Jig

Part No. 5 shows a different type of jig and one in common use in factories, namely, hinged type, it being necessary to hinge one part in order to get the piece properly anchored inside it. The hinged top is shown thrown back to the right exposing the curved top of the needle valve lift lever. Six operations are done on this part, drilling three holes 11, 12 and 13 and reaming them out, reaming leaving them with a smooth finish. These three holes are all at different angles, it would be almost impossible to get them correct unless in a jig in which the workman has not to do any measuring but simply lock the part in place and put under the drills and reamers. The larger finger wheel at the left of the jig is on a short hinged rod and is used to lock the jig door in place, this door only locking when the part to be worked on is in its proper position.

Drilling the Holes

Every hole in the Schebler carbureter is jigged. Every hole that has to be reamed has the reaming done by jig or fixture, which is a simplified jig. All milling operations have special fixtures to hold the piece in position; in the rough foundry work jigs are used everywhere. In a

FIG. 3 CAM CASTING JIG

This jig is used for eight operations, drilling, counter boring, reaming and tapping the piece P which is inside the jig is shown at the lower left

Part No. 1 Part No. 2 Part No. 3 Part No. 4 Part No. 5

FIG. 4—FIVE TYPICAL JIGS USED IN WHEELER & SCHEBLER CARBURETER FACTORY

Part No. 1 shows the float lever jig with the piece below before being drilled and after drilling at points 1 and 2. Part No. 2 is the throttle lever jig with lever drilled at 3 and 4. Part No. 3 is the flushing lever bracket drilled and reamed at 5 and 6. Part No. 4 is the cam casting jig shown in Fig. 3. It has eight operations. Part No. 5 is the jig for drilling the needle valve lift lever. This jig has a hinged cover, needed in order to get the piece properly held

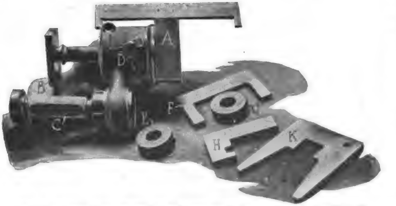


FIG. 5—GAUGES AND OTHER PARTS NEEDED IN INSPECTION DEPARTMENT

This shows gauges A, F, H and K to test accuracy of the carbureter parts when being inspected and also threaded plugs B and C to test accuracy of internal threads, and threaded rings E and G to test external threads on carbureter parts

word, it is jigs from first to last and nothing else but jigs. Although jigs are expensive it would be impossible to make carbureters without them and make the carbureter well—as it should be made. When parts are jigged they go together without trouble. The car owner in San Diego can buy a spare part and know that it will fit in his old carbureter without having to take a file or bit of emery paper to it. The carbureter dealer saves time in the transaction because he knows it will fit properly. Everybody saves time and money and the car owner gets good performance.

Cost of Making Jigs

But jig making costs money. The jig must be specially made for the part and its manufacture calls for high-priced skilled labor. It will take one expert workman 6 weeks at $4 per day to produce a jig such as any of these illustrated. This represents a salary alone of over $150 which does not take into consideration the materials used and the tool room equipment necessary to make such a part. Some jigs cost much more than this and when it comes to jigs for many car parts in a big car factory the cost runs into thousands of dollars. But in spite of their expense jigs are economical, they are good investments. They are the owner's protectors. They eliminate faulty work, they insure standardization. Where a factory has a good jig system you know their manufacture is all right. One factory expert said when asked how a certain car was made that he did not see the inside of the factory, he only saw the jigs used. He saw the accuracy of them, he saw the general use of them and he knew that the car's parts could not be made otherwise than well, no matter what the help.

In manufacturing the Schebler carbureter there are few grinding operations such as needed in a motor car. There is only one grinding operation in the carbureter and that is shown in Fig. 2. It consists in grinding the nickel steel cone C on the intake gasoline valve. This is the valve that is raised and lowered by the float and shuts off and lets flow the gasoline into the float chamber from the tank. This valve is shown in its normal size in the upper center of the illustration and immediately beneath it may be seen in a delicate watchmaker lathe having the small point C properly turned. The ball part B is to give it a universal support.

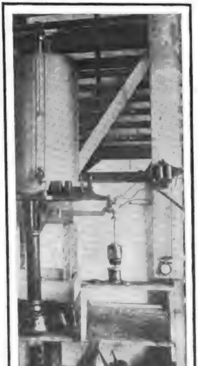


FIG. 6—SCALES TO WEIGH FUEL CONSUMPTION

The scales with fuel tank and electric wiring as electro-magnetic means for shutting off fuel when pre-determined amounts of fuel have been used

This is one of the small carbureter parts and yet one which calls for the utmost accuracy, accuracy only possible by using machines of accuracy sufficient for the finest watch parts. The two grinding machines neither of which is illustrated, have capacity of 800 each per day or a combined daily capacity of 1,600.

But a good manufacturer will go one step further in accuracy and interchangeability of parts. The jigging system is alright but it is followed up by an inspection system. The diameters of the holes drilled are tested; the threads cut to take plugs are tested; the length of a casting is measured; the diameter of a counterboard part is tested, and in short nearly every part is tested. The part must be right and while the jig is supposed to do everything right, it may be there has been a slight blowhole in the casting, which was not visible until a hole was drilled; it may be that the core of a casting has slightly shifted and this could not be detected until several operations were completed; then again a tool may become worn and of smaller diameter. A drill may get under size, so may a reamer or a tap. These are well looked after in the tool room checked up but often slight errors are detected in the inspecting room.

In the Inspection Room

The inspection room is a large table on which the carbureter parts are placed. In Fig. 5 a good conception of the work is given. Here is a carbureter casting D. Over it is slipped the gauge A to see that it is the proper length. A permissible tolerance or variation is allowable but if for any reason it exceeds this the part is discarded. Other gauges F, H and K are used to similarly test the accuracy of other measurements. While these parts are being tested bars B and C threaded on the ends are being screwed into the threaded parts of the casting to see if the threads are properly cut and there are internally threads rings E and G which are screwed over the threaded bosses on the casting. Similarly every carbureter part is taken and inspected before it goes to the assembly room or ever has a chance of finding its way into a carbureter. Only accurate parts reach the assembly tables.

Another example of accuracy of inspection is shown in Fig. 7 in which a workman is shown inspecting the cam K which regulates the lift of the needle valve by the opening and closing of the throttle. The contour of this cam is altered by the two adjustments A and A1. Each is a short screw with a spiral slot into which slot enters a short lip on the cam piece K. By turning the screws A and A1 the cam can be raised or lowered in the spirals and its entire contour changed, thus the regulation of the gasoline feed is assured. To make certain that this cam is correct before being assembled each one is tested with a gauge. When the adjustment is

set right by a screwdriver the cam is swung beneath the gauge finger and the hand or pointer on the gauge shows in greatly magnified reading the exact cam contour at each point. This reading must check up with the standard and until it does so it must be worked on until correct. With such accuracy there is not any difficulty with faulty adjustments and troubles after the carbureter is installed on the car. Other examples of similar accuracy in adjustment and testing could be cited but space will not permit.

The Laboratory Test

Before the carbureter ever reaches the factory, before the castings are made, before the jigs are made; in fact, before it is decided whether it will ever be produced or not it goes through a different type of factory, the laboratory. Here it is that it is tested, that it is given the horsepower test, that it is given the fuel consumption test, in fact, given every conceivable kind of test. It is foolish to begin manufacturing a carbureter before it is mechanically correct, before it gives desired results, etc. The laboratory is for this purpose. Fig. 8 shows the Wheeler & Schebler testing laboratory with a carbureter test in progress. Three men conduct the test: the one at the right is working with the carbureter attached to the motor; in the center the man is taking the horsepower readings on the scale beam of the electric dynamometer which is driven by the gasoline motor; and at the left is the assistant at the switch board regulating the load which the motor has to carry. With such an equipment the flexibility of the carbureter can be tested. Any desired load can be thrown on the motor in a fraction of a second and the horsepower readings will show the ability of the carbureter to give the necessary mixture in such an exigency. The motor is run at different speeds and the power curve charted to see how the power holds up with the changing speeds and if the curve is a good one. In the rear of the workman at the right is the arrangement for measuring the fuel consumption. This is shown in greater detail in Fig. 6. Here the large vertical tank of gasoline is shown with its fuel pipe leading to the carbureter. The scales are connected up with electro-magnetic controls so that when a pound or any weight unit of fuel is consumed the electric control immediately cuts off the supply and the test is stopped. In this way it is possible to determine gasoline consumption per horsepower minute or hour as the case may be. It is possible to determine if the carbureter is using too much fuel at low speeds, at intermediate speeds or at high speeds. With such a testing equipment it is possible to try out the carbureter in every possible way. But this laboratory is not confined solely to experimental jobs. Every other make of carbureter is given its tests, and its advantages and disadvantages discovered. In this respect the carbureter maker is far in advance of the car maker. He knows his rival's product whereas the car maker knows little about the other maker's car. The carbureter laboratory is doing amazing work for the industry today.

FIG. 7—TESTING CAM CONTOUR

By means of a special watch-type of gauge the cam contour is tested for the necessary accuracy. The cam contour is adjusted by the two screws A and A1 in each of which is a spiral slot in which the cam tongue rests

In the Chemical Room

While Figs. 6 and 8 show views of the physical laboratory there are two other carbureter laboratories, one is the chemical laboratory, Fig. 9, and the other is the refrigeration room illustrated recently in Motor Age. The chemical laboratory is for the analysis of various grades of

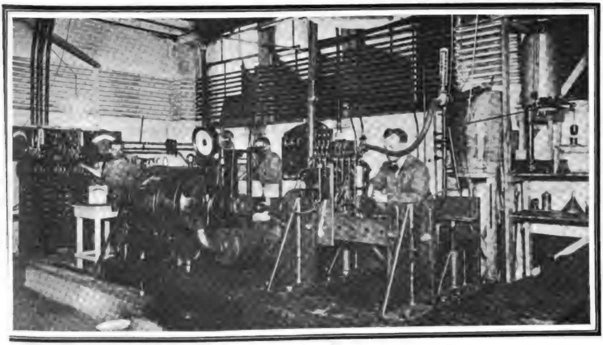


FIG. 8—WHEELER & SCHEBLER PHYSICAL TESTING LABORATORY

In this laboratory carburetors on test are fitted to the motor which is also connected to an electric dynamometer. Three men conduct a test. 'he right hand one works with the carbureter, the middle one takes the dynamometer readings and the left one handles the switchboard

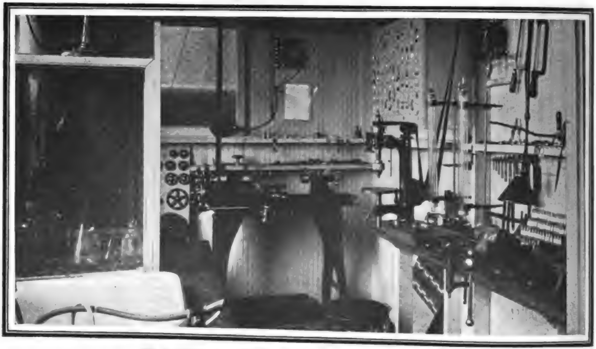


FIG. 9—CHEMICAL LABORATORY IN WHEELER & SCHEBLER FACTORY

This laboratory is used for testing the different grades of gasoline and other fuel as well as for examining different grades of fuel. It is a most important part of the factory

gasolines, napthas, alcohols and the myriad other fuels. Here the finest analyses are made. The merits of respective grades of gasolines are discovered. If a certain dealer is having trouble with his carbureter in a certain territory it is possible to have specimens of gasoline analyzed and the cause of the trouble may be found. The field of this laboratory is world wide and only expert chemists are employed. In the refrigeration laboratory arrangements are made to have the motor and carbureter in it run at any degree of cold, so that it can be determined if the carbureter will work in Alaska, in Greenland or in the most northern parts of United States and Canada. This is most essential, because it would be serious were a carbureter produced and marketed which would not give results in cold climates.

Production Manager's Work

After the jig man, the chemist, the physical tester and others have done their parts then comes the work of the production manager. He has to get out 1,200 or 1,500 carbureters per day with a limited floor space and with a limited force. System is his watchword. He must systematize everywhere. He must lay his factory out to get the best results. He must have it properly lighted, properly ventilated, properly arranged and must provide proper means whereby the workmen can accomplish results. In a carbureter plant where thousands of small parts are produced daily the systematic handling of them is a problem. In the Wheeler & Schebler plant the use of trays and wheeled trucks is carried to the highest degree. Fig. 10 shows a small wheeled tray filled with body castings before finally finished. Fig. 12 shows a much larger tray filled with similar castings after they have been lacquered and when they must be kept separate from each other until well dried. The castings are placed directly on this tray by the workman and when filled a boy can wheel it to the part of the factory where next needed. This is a large three-deck tray with the top deck of correct height for the workman. In Fig. 13 is a series of wall brackets on which single shelves are supported. These shelves contain burnished small parts that must be keep well apart. Instead of having each shelf on a set of wheels, it is fitted with end handles and is carried from the workman's table to the shelves by a couple of assistants, or if not carried can be wheeled there. Such a series of wall shelves contains an enormous number of parts in a very small space. When the tray is being filled by the workman it generally rests on his table or on a bracket built to support it. Throughout the entire plant trays of this nature are used and the raw and finished materials are kept off the floors. This makes it possible to keep them clean.

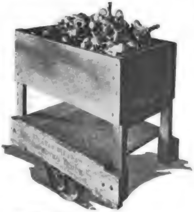


FIG 10—WOOD TRAY FOR ROUGH CARBURETER CASTINGS

Storing Extra Parts

Fig. 11 shows an interesting detail or factory organization in the form of long rows of bins across the end of the assemly room for carrying extra parts. Generally the parts for the machine shop come from the foundry machine shop and go direct to the workman, but frequently the capacity of the foundry shops exceed that of the machine shop and then the surplus is put in these bins. There is a separate bin for each piece and often when the bin capacity is reached some extra parts are piled on the tops. The aisle between the bins is wide enough for the wheeled trays and these trays are of the same height as the bins so that the labor of loading and unloading is minimized. The elevator to carry parts from lower to higher floors and vice versa is located at the far end of the bins, a most convenient location.

But the amount of system required by the production manager is not confined simply to the production of the

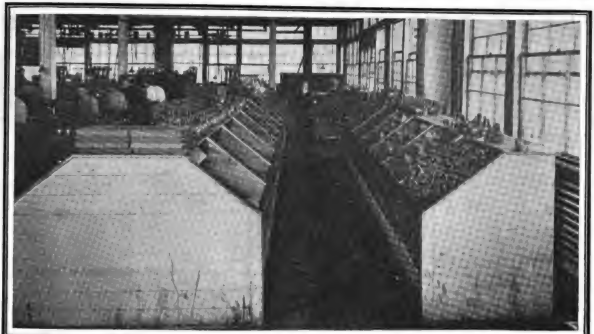


FIG. 11—SURPLUS PARTS BINS IN ASSEMBLY ROOM OF WHEELER & SCHEBLER CARBURETER FACTORY

necessary component carbureter parts and their assembly into the completed instrument, he has many other things to do. He must keep a supply of all of the parts of the different models made from year to year since the inception of the company. This is a herculean task. Take the matter of springs alone for the auxiliary air valve. Over a score of different springs are needed for one model. There is the spring for standard use, which is the average one employed; there is the spring for the seat level work in a California; there is the spring for high altitude work like Denver; and there is the spring for excessively cold weather. But if this were all his task would not be difficult, but go a step further: Nearly every car maker wants a spring specially suited for his motor, which has its own characteristics and so calls for special attention in the spring line. Then it must also have its special springs for the California field, for Colorado and for average use.

What is true of the spring field is also true of the hot air intake horns. Blue prints must be made up for the different motors, so that everything fits properly. It may be there are over a hundred different designs of these.

Up to the present time it has been necessary for many carbureter makers to have special intake manifolds for the different motors, due to differences in flange sizes, etc. This has been a ridiculous situation, but one that has to be met.

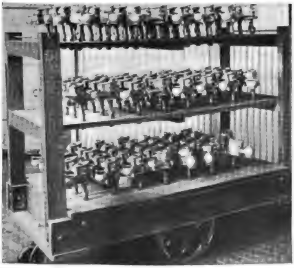
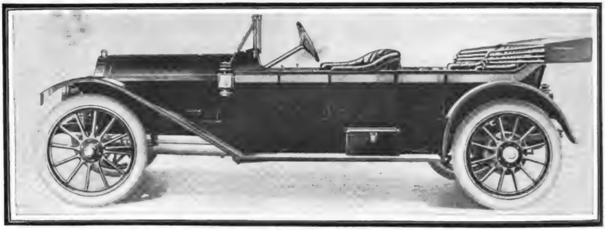


FIG. 12—THREE-DECK WHEELED TRAY FOR FINISHED CARBURETER PARTS

FIG. 13—WALL SHELVES FOR FINISHED PARTS OF CARBURETERS IN WHEELER & SCHEBLER FACTORY.

Nyberg Has Added Light Car to Line



NYBERG 1913 SIX-CYLINDER TOURABOUT SHOWING NEW BODY LINES

Four Chassis Models of Anderson Factory Include Two Sixes and Two Fours—Details of New 4-37

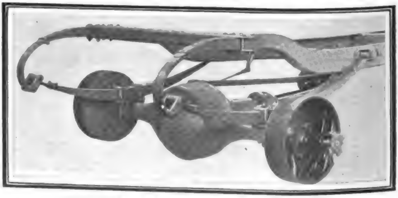
FOUR distinct chassis models will comprise the 1913 line of Nyberg cars, a new model having been added to the number for this year. The new model is the smallest of the fleet and is known as the 4-37. The three older models, which are continued for the new season, mechanically the same as this, are the 4-40, 6-45 and 6-60. The same general construction is employed throughout the four models, and they differ only in sizes of the various parts. On the three larger models two different wheelbases are employed, the roadsters and smaller touring cars having a shorter wheelbase than the larger touring car. The motor sizes and wheelbases of the four models are as follows:

Model	Cylinder	Bore Inches	Stroke Inches	Wheelbase Inches
4-37	4	3¾	5¼	118
4-40	4	4¼	5¼	118-126
6-45	6	3¾	5	126-134
6-60	6	4¼	5¼	126-134

All of the different models of Nyberg cars follow the same general lines in their designs. They have a unit power plant, with three points of suspension; enclosed flywheel and an enclosed multiple-disk clutch, which runs dry or in oil as desired; two universal joints in the final drive; floating pressed steel rear axle; and a drop forged front axle of I-beam construction. The frame is made of pressed steel and is unusually heavy, having a drop in front of the rear axle. The rear springs are bolted directly on to the cross member, which makes the rear spring support a part of the frame instead of having an additional piece riveted on for that purpose. The rear springs are three-quarter elliptic, 51 inches long, while the front ones are semi-elliptic and are 38 inches in length.

In the 4-37 model is the new long-stroke Rutenber motor with a 3¾-inch bore and a 5¼-inch stroke. This engine is so well known that a detailed description of it is unnecessary. However, this particular motor has some interesting new features worthy of emphasis. Chief of these is the fact that the magneto and pump are located in the front instead of on the side, and are driven by the same two-to-one gear which turns the camshaft. Another feature of this motor is that its cylinders are cast en bloc. The valves work by means of a direct lever and a roller lift from the drop-forged camshaft, the lifters being offset. Every part of the motor is enclosed. The crankcase is made of a special aluminum alloy and is well ribbed in order to make it extremely strong. The pistons are very large, but are balanced so as to reduce the friction, both on them and on the cylinder walls. The five rings are of the eccentric type and made of a special alloy to allow for a great deal of elasticity. The crankshaft is unusually large, being 2¼ inches in diameter. It also is made of a special alloy, is machined and ground to micrometer sizes to insure quiet running. To assure perfect alignment of the crankshaft, it is supported by five exceptionally large bearings. These bearings in the motor are plain, while everywhere else throughout the construction of the Nyberg cars annular ball bearings are used.

Ignition is supplied by Remy magneto and a Schebler or Stromberg carbureter is the vaporizing element. The clutch on all the models of the Nyberg cars is of the multiple-disk variety. There are six driving disks which are faced on both sides with raybestos, while the seven driven disks are of steel. A gearset of the selective type with three forward speeds; gears and shafts are nickel-steel, hardened and ground; annual bearings of liberal size are supplied in the gearset and the latter is attached to the crankcase just behind the flywheel housing in order to make the unit power plant, and is in no way connected with the frame. This secures an accurate alignment of the transmission with the motor, thus preventing any unnecessary strain on those parts.



REAR AXLE AND SPRING SUSPENSION ON 1913 NYBERG

ROADSTER BODY FITTED TO 1913 NYBERG 6-60 AND 6-45 CHASSIS

In the final drive two large universal joints are used, which are both enclosed and packed in grease, thus protecting them from dust and making possible their thorough oiling.

In all the models of Nyberg cars, the Hess floating pressed steel rear axle is used. This axle presents a very neat appearance, since it is all in one piece of steel and with a smooth surface, leaving no corners or pockets in which mud or grease can collect, and reducing to a minimum the difficulty of keeping the car clean. The part of the axle which serves as the housing for the differential is oval shaped, having a cap on the rear of it which can be removed. In this way, the differential can be inspected, adjusted, or removed without the necessity of jacking up the car.

Both the service and the emergency brakes are of the internal expanding type. On the model 4-37 the brake drums are 14 inches in diameter, while on all of the other models they are 16 inches in diameter. The service and the emergency brakes are placed side by side within the brake drums and when the power is applied to them they are forced by means of a lever to run against the drums. The brakes are 1¾ inches wide and are covered with raybestos.

The 4-40 and 6-60 models are alike in practically every respect except that four cylinders are used in the one and six cylinders in the other. The cylinders have a bore of 4¼ inches and a stroke of 5¼ inches and are cast separately. The motors have the pump and magneto on the right side and the valves on the left. For the Nyberg 6-45 model, a six-cylinder motor with a 3¼-inch bore and 5-inch stroke is used. This engine has its cylinders cast in pairs, but in all other respects it follows the same design in its construction as the motor used in the other models.

The bodies fitted on these chassis include a roadster and five-passenger touring car on the 4-37 with a wheelbase of 118 inches. In the 4-40 model the same wheelbase is used with roadster and five-passenger body, while in the seven-passenger touring and the tourabouts, the wheelbase is 126 inches. The two six-clyinder models fit roadster and five-passenger touring bodies on a 126-inch, and the tourabouts and seven-passenger bodies on a 134-inch wheelbase.

The four-passenger tourabout is one of the new-style bodies for 1913 cars. This body is long and low, which gives it a racy appearance. This impression is exaggerated by the high seats which the body has. Both the front and rear tonneaus are very wide, which gives the passengers an increased amount of leg room. The seven-passenger bodies have the same length of wheelbase as the tourabout, but additional room is provided for in the rear tonneau by extending the body farther over the rear wheels. These seven-passenger cars have two extra revolving seats. The floor of the tonneau is covered with a very heavy black carpet, which adds much to the neatness of its appearance. The front tonneau is floored with a dark green linoleum which is held down by an aluminum moulding.

In 1913 the Nyberg cars will be trimmed with nickel. Another attractive feature of the cars will be the fact that the step-hangers are enclosed, that the dust-shields present an unbroken surface between the aluminum running board and the bottom part of the body.

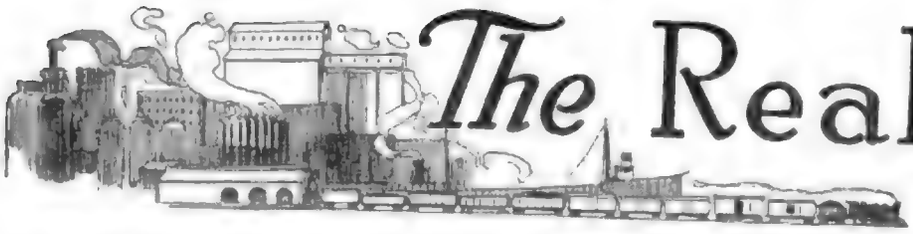
The Motorists' Bookman

Liquid Fuel and Its Apparatus

AS AN abridged and abbreviated revision of the author's previous work on the subject, "Liquid Fuel and its Apparatus," by William H. Booth, F. G. S., is published by Constable & Co., London. This work deals broadly with the utilization of petroleum and its products in the production of power. It discusses mainly the use of crude and heavy oils in the generation of steam, treating, however, the use of these products in internal combustion engines, such as the Diesel, the Griffin, and the Hornsby. As is shown by the author, these latter engines, the first of the three discussed in particular, show much greater thermal efficiency and economy than steam applications, and produce power in great quantities with the minimum of waste of space and fuel. The book is illustrated with 120 drawings, diagrams and tables, contains 278 pages, and sells for $2.25.

PLAN VIEW OF NYBERG 4-40 CHASSIS

CENTER CONTROL OF NYBERG



The Realm of the Motor Truck Efficient Strike-Breaker

Power Vehicles Are a Great Advantages in Labor Disturbances

RECENT strikes abroad have awakened the tradesmen of England especially to the enormous advantages of motor vehicles in times of trade disturbances, and at the same time have brought them to an understanding of the motor truck as a delivery proposition which has entirely changed the general opinion and attitude toward the new delivery.

There is an especial disadvantage to the horse owner in times of strikes, for when his equipment is idle he is at a continual expense of feed and care for his horses which also lose through lack of exercise, and in a measure he is at the mercy of the strikers even though he does not take his wagons out.

If he attempts a delivery it is an easy matter for strikers to interfere and stop progress even though they commit no acts of real violence by cutting harness or the like, a thing which abroad if not here would get them into trouble at once. A horse system is easily impeded.

With motor trucks there can be no such interference, for to meddle with truck mechanism would be almost impossible on the road and a crowd of strikers on the approach of a truck would have to give way. True, in America they might beat up the driver, but no other feasible method of putting the truck out of commission seems to present itself without a real concentrated attack which might smash parts after the driver were put out of commission.

When the recent railway strike took place in England there was at once a strong movement toward the adoption of motor trucks by many of the larger firms and factories that are still behind with orders which have come in, many of them unsolicited. As a matter of self-protection firms which had to have deliveries to proceed with their business when the railway was closed cast about for some way to get their goods from a distance.

An English motor car company was held up at the beginning of the strike in the delivery of forged parts for their cars from Manchester, 60 miles away. A motor truck was immediately dispatched to the distant city and returned with the consignment—a procedure followed out during all the strike, saving the firm thousands of dollars.

The merchant using trucks in these times learned more than the fact of the greater aggressiveness of the motor truck in strike times. He found it as well a most aggressive business vehicle. He found for one thing that where his horses had been compelled to rest and feed at certain intervals during the day there need be no rest for the motor vehicle; that where horses made one trip a day the motor could make three; that where horses made a scant 20 miles a day the motor truck could and did make as high as 120 on their fine roads without difficulty. Inter-city work was possible and the name of the firm was spread about by the advertising on the truck sides over four times the territory formerly covered by horses. This brought added business and firms along the routes at the outside towns who learned that an order given one day would be delivered the next added to the trade largely in a short time. Places 40, 50 and even 60 miles away from business centers are visited daily by motor trucks in this class of trade.

The greatest surprise which the users received was when they found, however,

TABLE NO. 1. SHOWING RELATION OF DISTRIBUTION OF MOTOR TRUCKS TO POPULATION AND GOOD ROADS

STATE	Number of commercial motor vehicles in use in 1912	Population of State in 1910.	Population per square mile	Population in cities of 25,000 and upwards.	Miles of improved country roads in 1909.	Miles of paved streets in cities of 30,000 and up in 1907.
New York	7,892	9,113,000	191	6,355,280	12,787	2,052
Pennsylvania	2,664	7,665,000	171	3,015,161	3,365	2,154
Illinois	2,551	5,638,000	101	2,624,656	8,914	1,947
California	2,198	2,377,000	15	1,095,120	8,587	1,096
Massachusetts	2,045	3,366,000	419	2,155,475	8,463	1,912
Ohio	1,171	4,767,000	117	1,784,210	24,106	1,643
Michigan	1,146	2,810,000	49	939,929	6,900	687
New Jersey	1,080	2,537,000	338	1,368,927	3,377	687
Indiana	970	2,700,000	75	479,071	24,955	482
Minnesota	970	2,076,000	26	594,618	5,417	326
Missouri	832	3,293,000	48	1,080,087	4,755	1,119
Iowa	730	2,225,000	40	330,091	2,505	253
Wisconsin	580	2,333,000	42	592,885	10,167	590
Oregon	526	673,000	7	207,214	2,799	292
Connecticut	519	1,115,000	231	484,034	3,030	389
Rhode Island	410	543,000	508	367,851	1,042	377
Texas	382	3,897,000	15	473,375	4,802	358
Maryland	371	1,295,000	130	558,485	2,142	506
Colorado	239	799,000	8	286,854	320	118
Nebraska	220	1,192,000	15.5	194,328	249	167
District of Columbia	218	331,000	5,518	331,069	....	325
Utah	181	373,000	4.5	118,357	1,018	14
Washington	170	1,142,000	17	450,153	4,520	170
Georgia	155	2,609,000	44	391,608	5,978	249
Kentucky	146	2,289,000	37	352,607	10,114	354
Kansas	120	1,691,000	21	178,465	374	122
Virginia	100	2,062,000	51	292,638	1,903	191
North Carolina	96	2,206,000	45	50,762	2,313	...
South Dakota	96	584,000	8	.....	286	...
Florida	83	753,000	14	95,481	1,752	54
Maine	78	742,000	25	109,421	2,703	115
Delaware	78	202,000	103	87,411	186	59
Tennessee	78	2,185,000	52	322,419	5,353	427
South Carolina	54	1,515,000	50	85,152	3,534	36
Arkansas	51	1,574,000	30	69,919	1,085	25
Alabama	48	2,138,000	42	222,342	3,264	118
New Hampshire	48	431,000	48	96,068	1,448	29
North Dakota	46	577,000	8	.....	140	...
Louisiana	44	1,656,000	36.5	367,090	329	222
Oklahoma	42	1,657,000	24	89,483	361	40
Mississippi	36	1,797,000	30	.....	342	...
Montana	34	376,000	3	39,165	95	3
Vermont	34	355,000	30	.....	2,650	...
West Virginia	34	1,221,000	51	72,802	591	32
New Mexico	32	327,000	3	.....	104	...
Wyoming	29	146,000	1.5	.....	416	...
Nevada	28	82,000	.7	.....	46	...
Idaho	26	326,000	4	.....	510.5	...
Arizona	22	204,000	2	.....	273	...

Commercial Car

that their delivery costs were cut instead of increased. One large firm saved 53 per cent in delivery cost, cutting from 15 cents per ton mile which their rail delivery cost to 7 cents by motor truck. Another cut from 12 cents per package on a 12-mile haul to 8 cents per package on an 18-mile haul.

The strikes in England—first the railway strike and then the freight handlers' strike—have changed the entire attitude of the British dealer toward motor vehicles. Since the ability of the motor trucks has been so effectively demonstrated, the Britons view it in a different light.

Geographical Distribution of Trucks

N. A. A. M. Compiles Statistics Forecasting Future Growth of Industry

As a basis for determining the controlling factors of the geographical distribution of motor trucks, and to a certain extent the forecasting of the future growth of motor haulage in different localities, the National Association of Automobile Manufacturers of New York has compiled the accompanying tables. The comparisons here given disclose interesting aspects of the field and form premises from which useful conclusions may be drawn.

The frequent assumption that road conditions are the principal factor in the distribution of motor trucks in different localities is here belied by the facts, for states having the greatest mileage of good roads are not found among the leaders in the extent of truck usage. Ohio and Indiana, each with approximately double the mileage of improved country roads found in New York, have together but little over a fourth the number of motor trucks in use. Illinois, whose total improved road mileage is but one-third that of Indiana, has nearly three times the number of commercial motor cars.

The conclusion is therefore drawn that density population must constitute the determining factor in the number of trucks used in separate states. Yet Rhode Island, which outside of the District of Columbia has the greatest population per square mile, has but 410 motor trucks, while Connecticut, with a density of population of less than half that of Rhode Island, has 519 trucks. Here enters the factor of the size of territory included in the state. In this regard we find that Texas, the largest state in the union, has one truck to a thousand inhabitants, approximately, while the District of Columbia, the smallest territory under consideration, has one for but every 1,500. This in consideration of the fact that whereas Texas has but fifteen population to the square mile to the District's 5,518.

The controlling factor, therefore, as near as it can be segregated from the host of contributing influences, is concluded to be the proportion of population of a state living in large cities. An even closer relation is found also between the number of trucks and the number of miles of paved streets in a given state.

Other important influences, more or less independent of these conditions, are the general prosperity and temperament of the population. This accounts for the fact that California, whose progressiveness is well known, while ranking thirty-sixth in population per square mile, and twelfth in population, being the largest state in the union, next to Texas, ranks seventh alike in the proportion of population in large cities, in miles of improved country roads and miles of paved streets, and fourth in the number of motor trucks, while Missouri, ranking seventh in popu-

TABLE NO. 2. SHOWING STANDING OF STATES IN NUMBER OF MOTOR TRUCKS, POPULATION AND MILES OF GOOD ROAD

STATE	Rank in number of motor trucks	Rank in total population	Rank in population per square mile	Rank in population in cities of 25,000 and up	Rank in miles of improved roads	Rank in miles of paved streets in cities of 30,000 and up
New York	1	1	6	1	3	1
Pennsylvania	2	2	7	2	18	2
Illinois	3	3	11	3	6	3
California	4	12	36	7	7	7
Massachusetts	5	6	3	4	8	4
Ohio	6	4	9	5	2	5
Michigan	7	8	18	9	9	8
New Jersey	8	11	4	6	17	9
Indiana	9	9	12	14	1	13
Minnesota	10	10	30	10	11	18
Missouri	11	7	19	8	14	6
Iowa	12	15	25	21	24	21
Wisconsin	13	13	23	11	4	10
Oregon	14	33	42	27	21	20
Connecticut	15	31	5	13	20	15
Rhode Island	16	38	2	17	31	11
Texas	17	5	37	15	13	16
Maryland	18	27	8	12	26	11
Colorado	19	32	39	25	40	28
Nebraska	20	29	35	28	43	26
District of Columbia	21	43	1	20	..	19
Utah	22	41	43	30	32	38
Washington	23	30	34	16	15	25
Georgia	24	10	22	23	10	22
Kentucky	25	14	13	19	5	17
Kansas	26	22	33	29	36	27
Virginia	27	20	15	24	27	24
North Carolina	28	16	21	39	25	..
South Dakota	29	36	40	..	41	..
Florida	30	35	38	33	28	..
Maine	31	34	31	31	22	32
Delaware	32	47	10	35	44	30
Tennessee	33	17	14	22	12	31
South Carolina	34	26	17	30	16	14
Arkansas	35	25	29	38	30	34
Alabama	36	18	24	26	19	37
New Hampshire	37	39	20	32	20	29
North Dakota	38	37	41	..	45	36
Louisiana	39	24	28	18	39	..
Oklahoma	40	23	32	34	37	23
Mississippi	41	21	26	..	38	33
Montana	42	40	45	40	47	..
Vermont	43	42	27	..	23	39
West Virginia	44	28	16	37	33	..
New Mexico	45	44	46	..	46	35
Wyoming	46	48	48	..	35	..
Nevada	47	40	49	..	48	..
Idaho	48	45	44	..	34	..
Arizona	49	46	47	..	42	..

lation, nineteenth in density of population, eighth in proportion of population in large cities and sixth in miles of paved streets, ranks but fourteenth in the mileage of improved roads, and eleventh in the number of motor trucks.

Compared in percentages, the difference in this respect is even more marked for California, having 47 per cent of its population in large cities as against but 32.8 per cent in Missouri, 17.8 per cent of its country roads improved as against but 4.4 per cent in the latter state, shows but 50 per cent of its city streets paved, compared with 54 per cent in Missouri, while in percentage of trucks to each thousand population shows 92.5 per cent, as against but 25.3 per cent in Missouri.

From this it is seen that the difference in the truck market in these states is the result of the relative progressiveness and prosperity of their population.

That this factor has an important bearing on the subject may be seen in the comparison of those states whose quota of trucks is normal, subnormal and in excess of normal. In the first category come New York, Pennsylvania, Illinois Massachusetts, Ohio, Michigan, Connecticut, Rhode Island, Texas, Georgia, Maine, South Carolina, Montana, New Mexico, Nevada, Washington and Delaware. In the second come New Jersey, Missouri, Washington, Maryland, Kentucky, Virginia, Tennessee, Alabama, New Hampshire, Louisiana and Oklahoma. In the third class, those states whose progressiveness is conceded, come California, Indiana, Nebraska, Utah, Iowa, Oregon, Kansas, Arkansas and Florida.

In the case of the deficiency of Washington and Oklahoma, consideration must be given their newness, for no one doubts the progressiveness or prosperity of either of these states.

MOTOR TRUCK PROBLEMS

"The attitude of big business institutions toward the commercial motor vehicle is rapidly changing" says Gleeson Murphy of the General Motors Truck Co. "The question no longer seems to be 'Can we safely adopt mechanical transportation?' but rather—'How can we best equip our business with motor trucks?' As the president of one big eastern house sagely points out, 'Long ago it was plain to us that unless the proposition of motor truck installation was carefully considered and the pros and cons as to types and sizes investigated in a practical manner, economical, efficient and advantageous service could not be expected.'

"As a result of our experience with motor trucks and our study of the entire matter, it seems to us that any prospective installer of motor truck equipment will find his problem simplified if he will first answer for himself a few fundamental questions.

"First: What is the nature of the routes to be covered in the service? Is it all a town service or all a country service or does it partake of both characters?

"Second: What is the general character of the streets and roads? Are they comparatively level or are steep hills numerous?

"Third: What are the distances which each vehicle must cover in a day's round?

"Fourth: What is the character of the load to be carried? Is it light but bulky or heavy in comparison with the bulk?

"Fifth: Are the packages to be carried of large size, such as heavy furniture, pianos, safes, or the like, or are they small, such as groceries, jeweler's boxes, light dry goods, etc?

"Sixth: Are the goods and packages of such a nature that they must be protected from dust and rain or can they be carried in open wagons or so-called express bodies?

"Seventh: Are they of a fragile nature calling for unusually flexible spring suspension if the load is to be moved at speed?

"Eighth: What quantity of goods will usually be loaded up for each trip? Will the load be carried the full distance or only half the distance? Do the vehicles ordinarily return empty or are they partly loaded?

"Ninth: What is the most convenient body construction to admit of easy loading and unloading of the class of goods to be handled?

"Tenth: Would it be desirable in the case of heavy goods to enable the power of the motor to be utilized in loading and unloading.

"These are some of the principal questions for consideration in determining the type and size of motor trucks which will best meet individual requirements. Undoubtedly, there are many others but those I have mentioned will be sufficient to indicate how numerous are the points to be kept in mind. It is quite plain that three points—load to be carried, distance to be traveled, country to be covered—must all be carefully considered.

"Just as horses for a brewer's wagon or a heavy dray must be different from horses for light delivery wagons, so motor wagons for carrying tons of goods must be very different from light, comparatively speedly vehicles used for transporting parcels or goods not exceeding ½ or ¾ ton in weight."

TABLE NO. 3. PERCENTAGES SHOWING RELATION OF MOTOR TRUCKS TO POPULATION AND GOOD ROADS

STATE	Per cent of trucks to each 1000 of population	Per cent of population in cities of 25,000 and up	Per cent of improved country roads to total roads	Per cent of paved streets in cities of 30,000 and up
New York	86.6	71	16.13	54
Pennsylvania	34.7	39.3	3.84	55
Illinois	45.2	47	9.47	38
California	92.5	47	17.87	50
Massachusetts	60.7	65	49	61
Ohio	24.5	35	27.13	50
Michigan	40.8	30.7	10	46
New Jersey	42.5	54	22.76	56
Indiana	36	17	36.7	42
Minnesota	46.7	28.6	6.83	17
Missouri	25.3	32.8	4.4	54
Iowa	32.8	16	2.45	19
Wisconsin	24.8	25	6.64	56
Oregon	78.1	30	9.49	37
Connecticut	46.5	45	24.08	50
Rhode Island	75.5	68	49.14	80
Texas	9.8	12	3.8	26
Maryland	28.6	43	12.77	92
Colorado	30	36	1.08	8
Nebraska	18.3	16	.31	24
District of Columbia	65.8	100	....	72
Utah	48.5	32	12.23	4
Washington	14.8	41.5	13.19	6.7
Georgia	5.9	11.5	7.27	48
Kentucky	6.3	11	18.82	64
Kansas	7.0	10.5	.38	16
Virginia	4.8	15	4.38	61
North Carolina	4.3	2.7	4.79	..
South Dakota	16.4	....	.5	..
Florida	11	12.5	9.97	40
Maine	10.5	14.7	10.59	80
Delaware	38	43.2	6.22	63
Tennessee	3.5	14.7	11.66	46
South Carolina	3.5	5.5	11.02	51
Arkansas	3.2	3	2.97	13
Alabama	2.2	10	6.58	22
New Hampshire	11.1	22.2	9.58	14
North Dakota	8	....	.23	..
Louisiana	2.6	22	1.32	41
Oklahoma	2.5	5.5	.5	17
Mississippi	2	....	.86	..
Montana	9.4	10.4	.41	3
Vermont	9.5	....	18.4	..
West Virginia	2.6	6	1.84	50
New Mexico	8.9	....	.61	..
Wyoming	19.1	....	3.94	..
Nevada	31.7	....	.36	..
Idaho	6.7	....	2.77	..
Arizona	10.3	....	4.56	..

English Motor Truck Solid Tire Sizes

London Correspondent Furnishes Some Interesting Information

THE following report received from A. E. A. M. Turner, technical press correspondent in London, gives particulars of tire dimensions on leading British motor truck and wagon chassis and also the average actual mileages obtained from the tires in every day use, with the average loads carried going and returning and the service engaged in. The mileage figures as given in the accompanying table, are in all cases the averages of three sets of tires on each size of vehicle; that is, "the mileage shown as the result of using a particular size of rubber is the figure obtained from wearing out three sets of six rubbers, or eighteen tires in all. These results are all from vehicles used in actual service—not from manufacturers' demonstration machines—and have come from two or three vehicles each of the same make and load capacity in the different sets of results. To wear out eighteen tires might take a truck 4 years or more, and then even this would not give a representative result, as, while one truck might have an exceedingly careful driver who might get an extra 1,000 or even 2,000 miles out of his tires three vehicles would be more likely to have average treatment meted out to them.

"All mileages given are for the band type of tire. Pressed-in or grip tires are used very little in England. The figures are from records kept on the services of large business concerns. In making comparisons with American vehicles it should be remembered that English motor trucks are rated in long tons, equivalent to 2,240 pounds.

"The six makes of chassis appearing in the table are the products of the following manufacturing companies: Karrier, Clayton & Co., Ltd., Huddlesfield; Lacre, Lacre Motor Car Co., Ltd., Letchworth; Leyland, Leyland Motors, Ltd., Leyland, Lancashire; Commer, Commercial Cars, Ltd., Luton; Belsize, Belsize Motors, Ltd., Clayton, Manchester; Halliford, J. & E. Hall, Dartford, Kent.

"The Lacre 2-ton chassis has a four-cylinder 30-horsepower engine, which is exceptionally large for a British 2-ton truck, the average horsepower of seven makes of this capacity being 20 horsepower. The Lacre company has no engine between a two-cylinder 18-horsepower model and its 30-horsepower four-cylinder engine.

"The remaining well known make, the Dennis, has been purchased principally by McNamara & Co., Ltd., the big motor haulage contractors of Finsbury, London, E. C., but they will not part with tire mileages. The Dennis chassis are all fairly small-wheeled machines—32 and 34 inches all around—and I have heard various complaints of tire trouble in connection with them. I think the fact of the matter is that if a cheap, undersized or defective rubber has been fitted to a small wheel, it simply hastens the collapse of the tire, but does not necessarily destory it. As you no doubt know, an inferior tire seldom wears out, but it gets destroyed easily in ordinary use, collapses, leaves the rim or band, etc.

"London motor buses, running on 4-inch singles, front, and 4-inch twins, rear, fitted exclusively to cast steel wheels, give about 21,000 miles per set of six rubbers on an average.

"Trucks and wagons with live-axle types of final drive, give, under fair treatment, a bigger mileage from tires than chain driven chassis, mainly owing to the nice take-up of the drive.

"Of the few remaining cases in Britain where the driver is seated over the engine, it is found that the life, particularly of the front rubbers, is greatly decreased. The weight on the front rubbers is greatly increased, and the tendency, as the vehicle is being propelled over the road, is for them to be driven into the road. It is therefore most economical to have the engine under a bonnet, from the point of view of tire economy.

"The writer would like to add that he has been fairly actively in touch with rubber tires since 1892, and whether in carriage or solid motor tires, he has always found American rubber tires either distinctly better in quality, or at any rate as good as the best Continental tires. With the exception of the Dunlop Rubber Co., English solid tire makers are behind the continental ones. The main fault which I found in American tires was that there was not enough wearing rubber in them. They were merely shallow pads round the rim, and so we did not get a great mileage out of them. Their rubber, however, invariably wore with perfect evenness."

PROVES MOTOR ECONOMY

An interesting statement has been issued showing where the police department of Wilmington saved $655.20 during the past year in its patrol operation, due to the substitution of a motor patrol for two horse-drawn vehicles and four horses. The motor patrol, a Pierce-Arrow, was used. It cost, complete, fully equipped, $2,653.25; while a year's upkeep, including gasoline and oil, cost $724.80, or $60.40 per month. Two horse-drawn wagons cost $1,380 to operate in a year, including upkeep, maintenance, etc., or an average of $115 per month, which makes a saving of $54.60 per month in favor of the motor car. The patrol wagon outfit, when new, cost $2,250, while in the 18 years it was in service it cost the city $24,840 to maintain.

ENGLISH MOTOR TRUCK SOLID TIRE SIZES AND MILEAGES

Capacity rating tons	Tire Sizes Front single inches	Tire Sizes Rear twin inches	Mileage per set of six tires	Loads out tons	Carried return tons about	Nature of work	Where used
		KARRIER CARS					
1	32x3	32x2½	21,700	1¼	¼	Ry. parcels dely.	London
1½	32x3	32x3	19,867	1½	¾	Liquor delivery	London
2	32x3½	36x3½	22,180	2¼	1½	Cotton transport	Provinces
2½	32x4	36x4	17,360	2½	¾	General hauling	Provinces
3	32x4	36x4	15,841	3	?	Oil tank wagons	Provinces
4	32x4½	36x4½	16,180	4¼	3½	Cotton transport	Provinces
		LACRE					
1	34x3	34x2½	23,200	¾	½	Drapery and furn.	London
1½	34x3½	34x3½	16,870	1½	1½	Carpet cleaning	
2	34x4	34x4	18,740	2	2	Carpet cleaning	
3	34x4	34x4	15,460	3¼	Empty	Haul. cases from docks	
4	34x4½	34x5	21,863	4	2¼	Gas, hardware and supplies	
5	34x5	40x5½	16,910	5¼	1½	Building material	
		LEYLAND					
1	34x3½	34x3	24,670				
1½	33x4	34x4	21,721	1	½	Mineral water	Provinces
2	33x4	35x4	17,107	1½	¼	Furniture dely.	London
2½	33x4	36x4	17,008	2	1¼	Bottled beer	London
3	33x4½	37x4	15,200	3½	2	Bottled beer	London
4	34x5	40x5	16,800	4	2½	Beverages	
5	34x5½	40x5½	15,060	5	4½	Beer and cotton	
6	34x6¼	40x6¼	15,780	6¼	2	Barreled beer	
		COMMER					
1½	32x3	32x3	20,900	1¼	¼	Paper	
2	32x3	32x3	15,840	2	¾	Gas, hardware	London
3	34x4	34x4	16,974	3	½	Provisions	
4	34x4½	34x5	15,602	4	1½	Furniture	
5	36x5½	40x5	16,002	5	3	Building materials	
6	36x6	40x5½	14,865	5½	2¼	Contract haulage	
7	36x6¼	40x6¼	12,304	6½	3½	General haulage	Pickfords
		BELSIZE					
1	32x2½	32x2½	18,885	1¼	¼	General haulage	
1½	32x3½	32x3	17,570	1½	1½	Cotton transport	
3	36x4½	36x4	16,975	3	1½	Machinery transport	
5	36x5½	36x5	14,090	5¼	4½	Cotton transport	
		HALLFORD					
1½	34x3	36x3½	17,508	1¾	1¼	Laundry delivery	
2	34x3	36x3½	14,986	2	1	Boots and leather	
2½	34x4	40x4	16,808	2½	1¾	Contract haulage	
3	36x4	40x4	13,962	3	2	Gen. contract haulage	
4	36x4½	40x4½	14,670	4	2	Bottled beer dely.	
5	32x5½	40x5½	16,680	5	1½	Barreled beer dely.	

Current Motor Car Patents

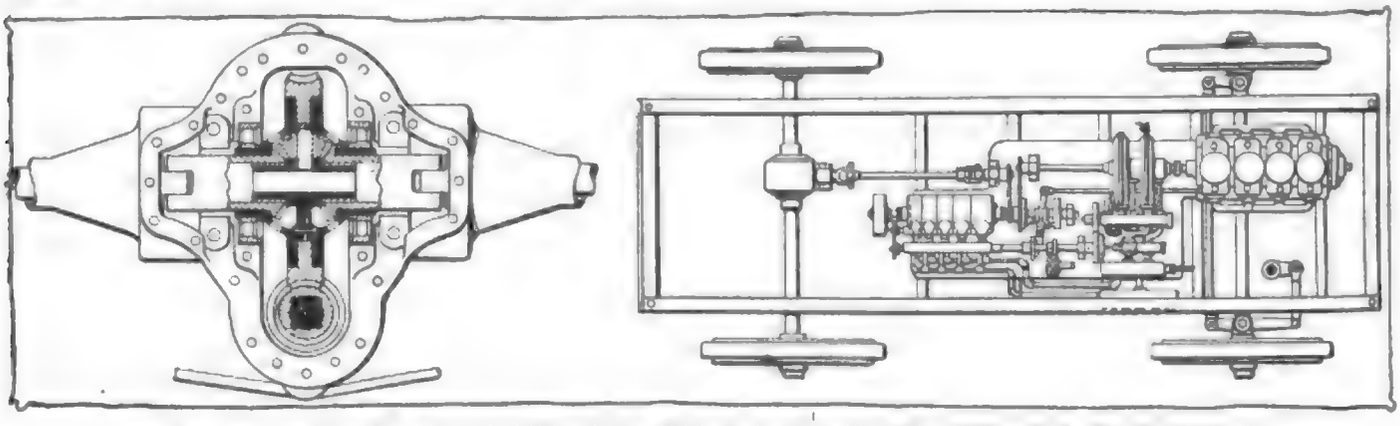


FIG. 1—WORM DRIVE BY T. J. LINDSAY OF INDIANAPOLIS AND OTIS HYDRAULIC TRANSMISSION

PATENTS ISSUED AUGUST 27, 1912

1,036,533—Vehicle Wheel. Wilburn C. Allen, Kansas City, Mo. Filed October 6, 1911. Serial No. 653,098.

1,036,536—Carbureter or Mixer for Internal Combustion Engines. Edward Glover Atkins, Minneapolis, Minn., assignor to Atkins Manufacturing Co., Minneapolis, Minn., a corporation. Filed July 8, 1909. Serial No. 506,478.

1,036,538—Roller Bearing. Charles A. L. Bach, Philadelphia, Pa. Filed November 10, 1909. Serial No. 527,269. Renewed January 20, 1912. Serial No. 672,476.

1,036,549—Automobile Radiator. Charles George Boeck, Jackson, Mich., assignor to the Novelty Manufacturing Co., Jackson, Mich., a corporation of Michigan. Filed October 16, 1911. Serial No. 654,929.

1,036,569—Half Retainer. Charles E. Colegrove, East Cleveland, Ohio, assignor to the White Sewing Machine Co., Cleveland, Ohio, a corporation of Ohio. Filed January 2, 1909. Serial No. 470,388.

1,036,579—Resilient Wheel. Wellington W. Darling, Delta, Colo. Filed August 28, 1911. Serial No. 646,364.

1,036,602—Signal for Pneumatic Tires. Fred Leo Fuller, Sacramento, Cal. Filed February 3, 1912. Serial No. 675,230.

1,036,606—Friction Gearing. Johannes Geissler, Dresden, Germany. Filed November 14, 1910. Serial No. 592,316.

1,036,636—Lumber Truck. Fred W. Karches, St. Louis, Mo., assignor to Fidel Ganahl Lumber Co., St. Louis, Mo., a corporation of Missouri. Original application filed February 4, 1911. Serial No. 606,570. Divided and this application filed January 20, 1912. Serial No. 672,453.

1,036,659—Driving axle for Motor Vehicles. Thomas J. Lindsay, Indianapolis, Ind. Filed September 21, 1908. Serial No. 453,952.

1,036,685—Vehicle Wheel. Raul Diez Muro, Habana, Cuba. Filed October 29, 1910. Serial No. 598,656.

1,036,690—Variable Transmission Gearing. James Novak, Chicago, Ill. Filed February 23, 1910. Serial No. 545,302.

1,036,713—Combined Muffler and Exhaust Pipe for Internal Combustion Engines. Walter T. Rice, Chicago, Ill. Filed February 9, 1912. Serial No. 676,609.

1,036,748—Tire Removing Device. William H. Tobey, Winthrop, Mass. Filed October 16, 1911. Serial No. 654,971.

1,036,776—Tire Armor. Harry Auperl, New York, N. Y. Filed January 20, 1912. Serial No. 672,359.

1,036,828—Spring Wheel. Harry W. Good, Lanark, Ill. Filed February 26, 1912. Serial No. 680,022.

1,036,829—Cushion Tired Wheel. Norman Gratz, Boise, Idaho. Filed October 5, 1911. Serial No. 652,903.

1,036,856—Pneumatic Shock-Absorber for Vehicles. Gustav Kanter, Victoria, Australia. Filed October 19, 1911. Serial No. 655,557.

1,036,885—Automobile. Harvey A. Moyer, Syracuse, N. Y. Filed December 29, 1908. Serial No. 469,772.

1,036,942—Means for Identifying Motor or Other Vehicles in Case of Accident. Oscar A. Weissenborn, Jersey City, N. J. Filed August 22, 1911. Serial No. 645,369.

1,036,955—Tire. George V. Benningholf, Meadville, Pa. Filed January 8, 1912. Serial No. 669,930.

1,036,972—Device for Starting Internal-Combustion Engines. David Eldredge Crouse, Annapolis, Md. Filed October 20, 1911. Serial No. 655,664.

1,036,981—Transmission Gearing. Cyrus C. Earnist, Riceville, Iowa. Filed October 9, 1911. Serial No. 653,578.

1,037,000—Controllable Headlight for Vehicles. Wilson B. Hargreaves, Bloomingdale, N. J. Filed October 24, 1911. Serial No. 656,540.

1,037,002—Reversing Transmission Mechanism. Norman T. Harrington, Lansing, Mich. Filed July 15, 1911. Serial No. 638,739.

1,037,004—Spring Wheel. Walter Hill, Mattoon, Ill. Filed December 2, 1911. Serial No. 663,579.

1,037,092—Means for Identifying Motor or Other Vehicles in Case of Accident. Oscar A. Weissenborn, Jersey City, N. J. Filed March 18, 1912. Serial No. 684,486.

1,037,094—Internal Combustion Motor. Edward P. Williams, Gloucester, Mass. Filed July 7, 1910. Serial No. 570,748.

1,037,126—Dump Body Motor Truck. Robert S. Cassady, Alameda, Cal. Filed March 4, 1912. Serial No. 681,542.

1,037,138—Air Deflector. Harry Craft Dunlavy, Fresno, Cal. Filed June 23, 1911. Serial No. 634,843.

1,037,167—Means for Braking Traction Vehicles. William E. Paine, New York, N. Y. Filed March 14, 1912. Serial No. 683,885.

1,037,168—Traction Vehicle. William E. Paine, New York, N. Y. Filed April 11, 1912. Serial No. 690,170.

1,037,080—Agricultural Automobile Traction Engine. Francois Thellier, Le Grand Priel, France. Filed September 19, 1911. Serial No. 650,074.

1,037,183—Automobile License Tag Bracket. Edwin M. Rosenbluth, Philadelphia, Pa. Original application filed May 25, 1910. Serial No. 563,299. Divided and this application filed August 24, 1911. Serial No. 645,725.

1,037,144—Vehicle Wheel. Thomas J. Holland, Antigo, Wis. Filed April 20, 1911. Serial No. 622,377.

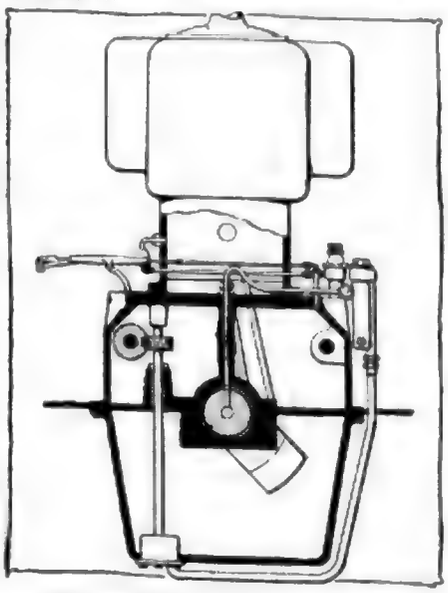


FIG. 2—PACKARD OILING SYSTEM

HYDROCARBON MOTOR—No. 623,624. Sidney D. Waldon, Detroit, Mich., assignor to the Packard Motor Car Co. This patent relates to an oiling system applicable to various types of hydrocarbon motors. With this device, which is a species of pressure system operated by the motor shaft, the oil delivered is controlled by a pressure relief valve. There is means for normally feeding oil to certain parts of the motor and means controlled by the rise of pressure in the normal feeding system to feed oil to other parts of the system. Fig. 2 shows this system as applied in the motor crankcase.

Power Transmission System—No. 477,749. August Sundh, Yonkers, N. Y.; assignor to the Otis Elevator Co. of Jersey City, N. J. A certain amount of interest attaches to the fact of the Otis Elevator Co. now making worm drives for motor vehicles, taking up a device along motor vehicle and truck lines in the shape of an hydraulic transmission. The patent covers a prime mover and pump connected to it fixed to deliver the fluid medium at different pressures to a motor, the connection between the pump and motor being controllable. The motor is made up of a number of sections, the power being proportional to the number connected. The pump valve and motor valve are controlled in a series of steps for different ranges of speed and power.

Pneumatic Wheel—No. 655,555. Gustav Kanter, Murtoa, Victoria, Australia. In the search for a spring wheel to take the place of the pneumatic tire many devices have been proposed. This especial construction, doing away with springs, aims at a pneumatic resiliency without the rubber wear of an air tire.

In this arrangement an annular air chamber is provided about the hub with a series of cylinders projecting radially from it and connected to it. A piston is arranged within each cylinder and thrust devices bearing on the floating rim. Fig. 3 shows a sectional view of this pneumatic wheel.

Manufacturers' Communications

NEED FOR NEW RATING

DETROIT, Mich.—Editor Motor Age: When a mathematical formula will not give the right answer, it is time that formula was abandoned. When the A. L. A. M. formula for rating horsepower will not give the horsepower which an engine will actually develop, it is time another method of figuring was adopted for the purpose.

There is but one kind of horsepower, and that is work accomplished. There is but one way definitely to measure 1 horsepower—that is by lifting 33,000 pounds 1 foot per minute. One horsepower in an engine is the capability of doing work equal to lifting 33,000 pounds 1 foot per minute.

For instance, a man lifting 33,000 bricks, each weighing a pound, and setting them on a platform 1 foot high in 1 minute, would be doing 1 horsepower of work. If, by means of a hoisting device, he could raise a block weighing 33,000 pounds 1 foot a minute, he would be doing work equal to 1 horsepower. Whether it is a man, a steam engine, an electric motor, or some other means of power, 1 horsepower represents exactly the same amount of work.

In a high-speed gas engine, such as is used in a motor car, the horsepower varies. In the case of the man lifting bricks, the faster he works, the higher will be his horsepower rating. The same is true of engine work. Thus, an engine developing a certain horsepower at 300 revolutions per minute will develop very much more at 1,000 revolutions per minute and still more at 1,500 revolutions per minute. If properly designed, its horsepower development will be still greater at higher speeds.

It therefore is obvious in rating an engine of a certain size that the speed of the engine has a direct bearing on the horsepower rating. An engine with four cylinders, each of which is 4 inches in diameter, with a stroke 4½ inches, could be given any number of different ratings. Each might be accurate for the speed at which the engine was running when the horsepower was rated. It could be truthfully stated that such a motor was a 12 horsepower motor, if rated at 600 revolutions per minute; or you might say that it was a 20 horsepower motor, if it was rated at 1000 revolutions per minute; and if it was rated at 1,200 revolutions per minute it could accurately be called a 25 horsepower motor.

It therefore is necessary for comparative purposes to set some speed at which a motor should be rated. Again, there are two ways of rating a motor at a given speed—one is theoretical and the other practical. A theoretical rating may be obtained by figuration, by using a certain formula to arrive at the horsepower. In some instances, the use of such a formula is the only possible means, as in deciding what size of motor would be required to do certain work. Yet, at best the formula method is rather misleading under most circumstances.

Where the motor is already in existence, there is a second means—that of testing the motor for horsepower. This means is positive and practical. The motor is connected with a testing apparatus, run at a certain speed, and the horsepower is actually measured.

The Royal Automobile Club of Great Britain, some years ago, decided upon a formula for computing horsepower which was later adopted by the engineers of the mechanical branch of the A. L. A. M. This formula, rating the motor at 1,000 feet piston speed, was decided upon, in this country at least, by a comparison of results of horsepowers obtained in actual test from numerous motors of various sizes and compressions.

By "1,000 feet piston speed" is meant, a motor running at such a number of revolutions per minute that the piston will move up and down in the cylinder at the rate of 1,000 feet per minute. For instance, if the stroke were 6 inches, the piston would travel down 6 inches and up 6 inches with each revolution of the motor, that is it would travel 1 foot with each revolution. Thus, in that motor, at 1,000 revolutions per minute, the piston would travel 1,000 feet. If the stroke were less than 6 inches, the motor would have to run faster than 1,000 revolutions per minute, and vice versa.

This formula was adopted several years ago, and great strides have been made toward motor efficiency since that time. There is something wrong with a motor today that will not develop 50 per cent more horsepower than its rating by the A. L. A. M. formula. Such a rating is neither doing the motor justice, nor giving the parties interested an accurate idea of the power developed. There is, therefore, a necessity felt for a new rating by which motors of different sizes may be compared. At the present time there is no such formula and there is no standard speed. Various makers are rating motors of the same size at different horsepower, according to the speed upon which they base their calculations.

In the case of the Chalmers motors, although the old A. L. A. M. rating would not be within reason, it was thought desirable to stick as close to the once accepted formula as possible. The most reasonable workout seemed to be to stick to the old motor speed of the A. L. A. M. formula, and actually test the motors at 1,000 feet piston speed. Therefore, Chalmers motors are tested at 1,000 feet piston speed per minute, and the horsepower is determined by actual measurement at that speed.

The Chalmers "36" develops, as an average, 36 horsepower at 1,000 feet piston speed, or at 1,143 revolutions per minute. Yet by the A. L. A. M. rating, its horsepower is only 29. The Chalmers Six develops 54 horsepower under the same conditions, but by the A. L. A. M. rating its horsepower is only 43½. Thus the inconsistency of the old A. L. A. M. formula is apparent.

On the other hand, it would be possible for us to test our motors, as some do, at 1,500 revolutions per minute and claim over 40 horsepower. I know of one instance where a motor of less bore and stroke than the Chalmers 36 is given a higher rating. This is obviously unfair both to the manufacturer who rates his motors at the accepted 1,000 feet piston speed, and to the purchaser who accepts as truthful a manufacturer's rating of his motor. Personally, I consider all rating made at other than 1,000 feet piston speed distinctly misleading unless the actual speed in revolutions per minute at which the rating is effective is given.

Rating the motor in the actual test at 1,000 feet piston speed seems advisable, as this is about the speed of the motor in ordinary actual use. This is obvious, upon consideration, inasmuch as the large motors, with longer strokes, will allow the car to be geared higher so as to let the motor run slower for a given speed of the car than would be possible with a small motor.—George W. Dunham, consulting engineer Chalmers Motor Co.

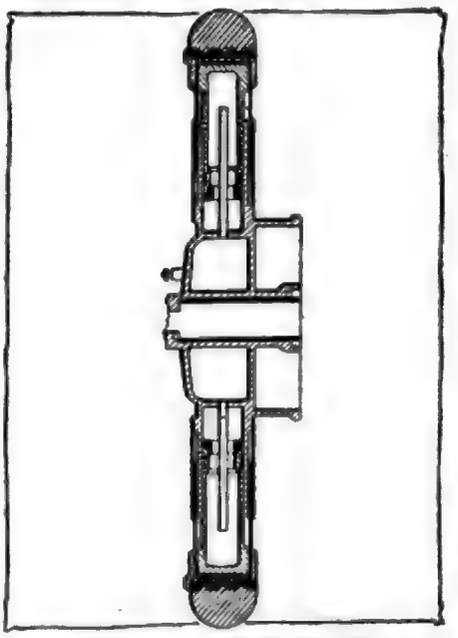


FIG. 3 AUSTRIAN PNEUMATIC WHEEL.

From the Four Winds

LUGGAGE EQUIPMENT USED BY C. J. MOORE

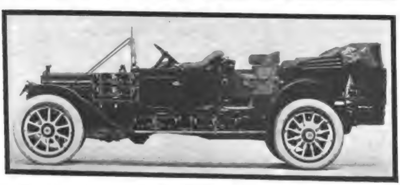
LONG Road Nearly Finished—The King Edward highway, or the reconstructed road from Longueuil to the intercolonial boundary at Rouse's Point, will be completed the latter part of September. The highway is 40 miles long and the total cost will be $250,000.

Mexicans Keep Busy on Roads—Another step towards the construction of an extensive system of modern highways in the states of Hidalgo, Vera Cruz, Puebla and Mexico has just been taken by the department of communications and public works of the federal government. It has directed Engineer Eduardo Symonds, head of the bureau of inspection of roads and bridges, to confer with Governor Ramon Rosales of the state of Hidalgo on the subject of making early provision for completing the highway between Pachuca and this city. Mr. Symonds is also directed to confer with the authorities of other states in regard to constructing an extensive system of good roads that shall ultimately form a part of a general system of improved highways to extend to all parts of the republic.

Wisconsin's Car Count—The rank and wealth of Wisconsin as a motoring state is indicated by a compilation of statistics by A. J. Cobban, in charge of the motor registry and license department of the secretary of state's office at Madison. During the period from January 1 to July 1, 1912, there were licensed 23,505 motor cars and 3,816 motor cycles, a total of 27,321, or one motor vehicle to every eighty-five persons resident in Wisconsin, according to the given population of 2,333,860. If the average Wisconsin family consists of five persons, then every seventeenth family owns a motor vehicle. Milwaukee county, of course, leads in the number of registrations, but the figures have surprised even the most conservative guessers, being 5,120. The highest guesses were 4,000. Racine county ranks third with 1,015, while Kenosha county has but 401. The total receipts for registration fees during the period were $124,303, while the cost of administration was $18,750.67. The sum of $79,164.25 was distributed among the counties in accordance with the number of vehicles registered. Twenty-five per cent of the total receipts are turned into the state highway fund.

Ohio Orders 1913 Tags—The Ohio motor car department has awarded the contract to supply 75,000 sets of number plates for the year 1913 at a bid of 22¼ cents per set. The price paid is 1¾ cents lower than in 1912. The 1913 tags will have a white background with maroon letters. The tag will contain the letters "Ohio" and the figures "1913" in the same form as on the 1912 number plates.

Road Work Near Milwaukee—The estimates prepared by County Highway Commissioner H. J. Kuelling, of Milwaukee, for highway work under state aid during 1913, demand an appropriation of $190,000 from Milwaukee county, this sum drawing $65,000 from the state highway fund, making a total of $255,000 available for permanent road work in Milwaukee county during next year. Commissioner Kuelling plans to rebuild 40 miles of roadway with concrete, the county to purchase $40,000 worth of machinery and accomplish 20 miles of the work, while the remainder is to be let to private contractors. Twenty miles of road are being paved with concrete this year, and according to present figures, every inch of public highway in Milwaukee county will be paved with a permanent pavement at the end of 5 years.



PACKARD CARRYING THIRTEEN PIECES OF BAGGAGE

Working for Safe Bridge—Bay State motorists are complaining that no action seems to be made by the officials of West Brookfield, Mass., toward eliminating the dangerous condition at the Makepeace railroad crossing where four motor accidents have occurred within a year. It is one of the most dangerous between Springfield and Worcester, for vehicles coming in either direction cannot see each other. The Leominster Automobile Club has written a letter of protest to the selectmen of West Brookfield, and other clubs are now taking up the matter in an effort to have something done to improve conditions.

Woman's Tourist's Camp Wagon—The camp wagon shown in an accompanying illustration was made by the Kissel Motor Car Co. for Mrs. A. J. Payson, of San Mateo, Cal. This is designed for extended touring over rough and wild country where good hotels are few and far between. The chassis is a 50-horsepower Kissel 1-ton truck, and has a wheelbase of 132 inches. The seats are practically those of a roadster. Back of the seats is a space of about 1 feet on which rests the body as shown in the photograph. This body carriers provisions, fishing tackle, guns and a very comfortable bed with spring mattress. When camp is struck, the canvas shown in the illustration is supported on gaspipe uprights which fasten into the body, giving a head room of about 6 feet. Gaspipe outriggers extend to each side and from the ends of these, side curtains are run to the top, making a pyramid-shaped tent. The bed then is swung crosswise on the chassis right back of the driver's seat inside of the tent, making a very comfortable boudoir, electric lighted from a

FRENCH YOUNGSTERS MODEL CAR OUT OF SAND

storage battery. Mrs. Payson left San Francisco recently for an extend trip, her itinerary including a trip over the high Sierras, then up through eastern California, thence through Oregon, Washington and over into Idaho.

Cino in Long Race—Concerning the 200-mile race at Cincinnati, Haberer & Co., entrants of the Cino, point out that their car won the 50-mile cup; that it lost 22 minutes at the pits, mostly because of tire trouble and that its actual running time was 3 hours 13 minutes 15 seconds as against 3 hours 18 minutes 3⅘ seconds for the winning Mercer. The Cino had eighteen tire changes in 200 miles, caused by the use of "green" tires.

Columbus Wants Speedway—Since the 200-mile race given recently under the auspices of the Columbus Automobile Club was such a success from every standpoint, the club will now turn its attention to promoting a speedway. It is believed that a board speedway will be a success in central Ohio and the club will proceed on that theory to test out the sentiment among its members. The matter was taken up previous to the race, but the arrangement required the attention of the officers of the club and the speedway was dropped temporarily. The situation will be thoroughly canvassed in the near future.

Cars Ruled Off Reservation—As a result of several motor car accidents in which children have been killed and injured on the Revere Beach boulevard in Massachusetts within the past few weeks, the metropolitan park commission has closed the drive to motor cars for 10 days, and may extend the restriction until late in the fall. As a result the annual motor car parade at the beach in connection with the Mardi Gras festival next Saturday had to be declared off. The Massachusetts highway commission has come in for much criticism for not building a continuation of the state highway in the rear of the beach boulevard where vehicles could go on crowded days and eliminate the danger. The boulevard is one of the through links to the north shore, and closing it will sadly disappoint the motorists.

Put's Hill May Go—Put's hill, named after General Israel Putnam, the revolutionary general, who made the hill famous by riding down its steep stone steps to escape capture from the British army more than a century ago, when the English were invading Connecticut, is destined to be wiped out by the march of progress. A hearing is to be held at Greenwich, Conn., shortly, at which the question of removing the hill will come up as it is located on the Boston post road used by thousands of motorists every year, and it is in the way.

Keeps Down Cost of Living—Davenport, Ia., retail provision merchants are complaining that the increase in the number of motor cars has brought about a decided cut in prices. They say people living in the tri-cities and owning cars buy a large share of their provisions in the country during the summer time and that while the farmer does not peddle his produce from house to house the city consumer has formed the habit of driving out into the country and making their purchases there instead of in town. This same practice is followed by transfer companies hauling with both horse-drawn and motor vehicles, as a truck is frequently sent out into the country to buy hay, straw and feed, the transfer firms finding they can buy at a far cheaper price there than of the city commission firms.

Modern Touring Equipment—For motor tourists who require ample packing facilities, the equipment designed by C. J. Moore is about the ultimate in accessibility and in economy of space. Mr. Moore is a consistent traveler, having covered about all of Europe and the greater part of the United States. Realizing what was most needed, he designed a set of luggage that may be easily and compactly stored away on a Packard touring car. There are thirteen pieces in the complete outfit, all designed for a certain purpose and position on the car. Each piece has a waterproof covering and is held in place by straps, which are easily detached from the car when the cases are removed. Two trunks are supported on the trunk rack, one above the other and a suit case is attached just below the rack. On the left front fender is a lunch kit and resting on this are two suit cases. Two suit cases have been placed on the left running board. An ice box is attached on the right front fender with a hat box above. The tire trunk is attached to the extra tires on the right running board. Two suit cases are placed in the tonneau under the robe rail. The trunks are fitted with trays and the suit cases with dividing boards. The ice box contains two galvanized trays, one for ice and one for eatables. Ice will keep for about 10 hours. The lunch kit contains plates, knives, forks, spoons and napkins for seven people, also drinking cups, salt and pepper shakers, etc.

KISSEL CAMP WAGON FOR WESTERNER'S TOUR

Among the Makers and Dealers

SPRING Company Expanding—The Tuthill Spring Co., of Chicago, has been compelled by expanding business to buy the only remaining piece of unimproved property adjacent to its work. This is a lot 25 by 119 at 753 Mather street.

Two Concerns Change Names—The E-M-F and Flanders Sales Co. of Columbus, Ohio, has filed papers with the secretary of state changing its name to the G. E. Thomas Co. The Household Rubber Co. of Youngstown, Ohio, has filed papers with the secretary of state changing its name to the Auto Cycle Supply Co.

Canadian Shows—The motor show season in Canada will commence early this year, the dates for the Montreal show having been fixed for January 4 to January 11. The drill hall will again be the scene of the exhibition, as in recent years will be held under the auspices of the Automobile and Aero Club of Canada.

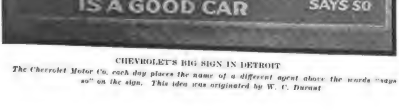
Hoosier Concern Reorganized—W. K. Millholland, who has been conducting the W. K. Millholland Machine Co., in Indianapolis, has reorganized the company under the same name and it has been incorporated with an authorized capitalization of $50,000. Others interested in the company are Paul Millholland and A. M. Millholland. The concern is a contractor and manufacturer of motor car parts and is located in the Industrial building.

Another Motor Plant for Flint—Flint, Mich., is to have another important industrial enterprise through the organization of the Sterling Motor Co., which has filed articles of incorporation at Lansing. The company is capitalized at $300,000 and will engage extensively in the manufacture of six-cylinder engines. The initial output of the new plant will be taken by the Little Motor Car Co., of Detroit, which is preparing to place a six-cylinder on the market next January. Detroit capital is invested in the company, which includes among its stockholders W. C. Durant, who recently organized the Republic Motor Co. of New York, with a capital of $65,000,000. Although no authoritave announcement has been made, it is understood that the Sterling Motor Co. will constitute one of the units of the Republic Motor Co., which already includes the Little Motor Car Co., the Chevrolet Motor Co. and the Mason Motor Co. of Flint.

Henderson Using a Tent—Having started shipments of its 1913 cars and being crowded for room the Henderson Motor Car Co. of Indianapolis has erected a huge tent in the factory yard to facilitate matters. Until the new addition to the factory is ready for occupancy, September 15, the overflow from the first assembly will be housed under the canvas, preparatory to the road test. The cars will then be handled in the main building and the finishing touches necessary to turn out the new Henderson added.

Speedwell Changes—The Speedwell Motor Car Co. of Dayton, Ohio, has reorganized its executive force, the changes bringing promotion and entailing new duties to several of the company's officers. President P. D. Schenck, who has been acting in that capacity since the company was organized, has assumed in addition the duties and responsibilities of general manager. J. E. Schneider, who has also been with the company since the beginning has been elected to the office of secretary and treasurer.

Goodyear Spreading Out—The Goodyear Tire and Rubber Co. of Akron, Ohio, is making preparations to open up branches in several of the countries in continental Europe, in England with head offices in London, and in South Africa and Australia. On September 5 L. C. Van Bever, of Toronto, Canada, vice-president of the Canadian company of the Goodyear Tire and Rubber Co., leaves for England to complete arrangements for the opening of the London branch, and to establish a complete distributing system throughout the British isles. Van Bever will form an English company of the American house. This will control the British interests of the company as well as those in South Africa and other British possessions. Other companies, it is understood will be organized under the supervision of Mr. Van Bever, in France and Germany and arrangements are being made to form a company in Australia to supervise the business on that continent and in New Zealand.



CHEVROLET'S BIG SIGN IN DETROIT

The Chevrolet Motor Co. each day places the name of a different agent above the words "says so" on the sign. This idea was originated by W. C. Durant

Building Foundry in Detroit—The Pontiac Auto Castings Co., composed of men from Detroit and Muncie, Ind., has started the erection of a foundry on Linfere street, Detroit, and will engage in manufacturing brass castings for motor cars. Later aluminum work and iron castings are to be added to the output. The company is capitalized at $15,000, and incorporation papers have been forwarded to Lansing for filing.

Making Cylinder Castings—The Reliance Foundry Co. of Richmond, Ind., has started making cylinder piston and piston ring castings. E. I. Hunt, formerly foreman of the Wayne Works foundry for 12 years, is president. George L. Schultz, also formerly of the Wayne works, is general manager. H. J. Brownell, secretary. These with John D. Teeter of the Light Inspection Car Co., Hagerstown, Ind., comprise the board of directors.

Indianapolis in Market—In line with its policy to displace horses in municipal service as rapidly as possible with motor vehicles, the city of Indianapolis is in the market for a gasoline ambulance to cost not to exceed $5,500. The purchase will be made by the city board of health and charities, of which Dr. Herman G. Morgan is secretary. The new ambulance will displace two horse-drawn ambulances in use at the city hospital and city dispensary. The hospital already has a gasoline ambulance while the dispensary has an electric ambulance, both of which will be continued in service.

Chase Company Changes—C. W. Moody, of Cleveland, O., has recently severed his connection as district manager for the Chase Motor Truck Co., of Syracuse, N. Y. Royal B. Curtiss, of Stepney, Conn., has been appointed in his place. Mr. Curtiss was formerly sales manager of the Royal Equipment Co., at Bridgeport, Conn. In his new position he will have the oversight of a territory including Ohio, West Virginia, Kentucky, Michigan and part of Indiana. He will make his headquarters in Cleveland. W. C. Van Sant, who has represented the Chase Motor Truck Co. for several years past in the capacity of western traveling salesman, has lately been made district manager for the Pacific coast. His headquarters will be in Los Angeles, Cal. C. K. Thomas, formerly with the Lukenheimer Co., of Cincinnati, and later with the Best Mfg. Co., of Pittsburgh, Pa., is another recent addition to the staff of district managers of the Chase company. Mr.

HENDERSON CRAMPED FOR ROOM

The Henderson Motor Car Co. of Indianapolis, being cramped for room, has erected a huge tent to facilitate shipments of 1913 cars

Thomas in his new capacity will make his headquarters in St. Louis, Mo. He will have oversight of a territory including Kansas, Missouri, Texas, Arkansas and Oklahoma.

Looking Into the Future—Officials of the Thomas B. Jeffery Co., of Kenosha, Wis., state that the company does not contemplate the erection of any new buildings on the 9-acre tract adjoining its present works, recently purchased, for the present. The additional land is to take care of the future needs of the Rambler works as they may develop.

Studebaker and Reo Cut Melons—Dividends have been declared by the Studebaker Corporation and by the Reo Motor Car Co. The Studebaker Corporation has declared its regular quarterly dividend of 1¾ per cent and the Reo company has announced its third distribution of profits this year amounting to about $200,000, which is 10.9 per cent on its capital of $2,000,000.

Akron Motorizing—The committee on fire and water of the Akron, O., city council at a recent meeting decided to act upon the recommendation of Chief Mertz and motorize the fire-fighting apparatus of Akron. It was decided to issue bonds in the sum of $75,000 to take care of the expense. It was shown by the figures submitted by the chief that the difference in maintenance would more than pay the interest on the issue of $75,000 bonds. Chief Mertz suggested the purchase of an 85-foot aerial truck and a number of combination hose wagons. A tractor also is recommended by the chief.

Berlin Gets Tire Plant—The property owners of Berlin, Ont., carried a by-law granting a bonus of $25,000 to the Canadian Consolidated Rubber Co., for the purchase of 15 acres on which to erect a tire factory. The company, which has already extensive interests in Berlin, receives the $25,000 and a fixed assessment for 10 years for that amount, after it has expended a quarter of a million dollars in buildings and equipment. This will mean the erection of two large factories at once. The company agrees to employ 100 skilled workmen the first year, 200 the second and 500 in 5 years. The building operations are to commence immediately.

Willys Against Yearly Models—Following his recently adopted policy of banishing the yearly model in connection with Overland motor cars, President John N. Willys also will apply this policy to Garford cars. Garford and Overland cars will in the future be manufactured each working day in the year just as any staple product is manufactured.

Safeguarding Against Explosions—As a precaution against gas explosions in the plant of the A. O. Smith Co., of Milwaukee, it has been decided to rebuild and relocate the welding department, blown up a week ago, on ground remote from the general factory buildings, the largest of which measures 345 by 1,025 feet. The explosion which wrecked the welding shop caused the death of the oldest employe of the company and serious injury to a score of other workmen skilled in the handling of oxy-acetylene and oxhydric welding and cutting apparatus. A tank, 25 feet long and 10 feet in diameter, filled with hydrogen gas, was blown 1,000 feet.

Hazard Makes a Change—W. E. Hazard, formerly secretary and sales manager of the Hazard Motor Mfg. Co. of Rochester, has resigned. F. D. Russell, vice-president, will assume the duties of sales manager. Erle Miller is to succeed Hazard as secretary.

Swinehart Stock for Sale—The stockholders of the Swinehart Tire and Rubber Co. of Akron, Ohio, have been notified that $150,000 worth of stock is offered for sale to the present stockholders at the rate of 23 per cent of their present holdings, no fractional shares to be considered. The new issue of stock is subject to action by the shareholders at a meeting called for September 25. The additional issue of stock is subject to action by the shareholders at a meeting called for September 25. The additional issue of stock was made necessary to provide a larger working capital.

FIRESTONE-COLUMBUS CARS USED BY COLUMBUS FIRE DEPARTMENT

Development Briefs in Accessory Field

FIG. 1—NEW FEATURES OF DISCO IGNITION STARTER

Simplified Disco—New Device Maintains Uniform Speed—Connecticut Absorber Adjustment

New Disco Acetylene Starter

DESIGNATED as model 16, the latest Disco acetylene starter has just been placed on the market. The new starter operates on the same principle as previous Discos, differing in the form of distributor valve and control thereof, and shows improvement in the engine valve design. The Disco starter of former years consisted of a distributor, mounted on the dash, with only its head protruding. This head was in the form of an ornamental controller plate, on which a small crank was placed. Connecting tubes from this distributor led to a two-way valve on the gas tank, and to each engine valve, the latter being substituted for the priming cups in each cylinder. The operating principle consists of the admission of compressed gas into the cold cylinder, by means of the rotation of the distribution valve, igniting it on the spark. The departures in the distributor design consist of the substitution of a needle valve for the one previously used, and a small single-throw lever on the controller plate, instead of the former crank. The engine valve this year is claimed to be self-cleaning. It consists of a three-way union, one lead of which is connected to the distributor line, another being threaded to fit the tap in the cylinder, and the third leading to the priming cup above. A small ball check valve is fitted, which, with the lever in the central position, admits gas from the distributor to the engine, but locks against any return of gas from the cylinder. With the lever turned to the left, a direct passage is opened from the priming cup to the cylinder, for priming with gasoline and decarbonizing; and with the lever to the right, it opens a passage from the engine to the priming cup, past the ball check valve, permitting the exhaust gases, when the cylinder engine is running, to blow through the valve, cleaning it of all soot and carbon, or for compression relief, when turning the engine over for adjustment, decarbonization, etc. The device otherwise remains the same as previously designed. Fig. 1 shows the new parts.

FIG. 2—TYPES OF AMERICAN TUBING

Pierce Speed-Controller

Uniform speed is the object of the Pierce speed-controller, manufactured by the Pierce Speed-Controller Co., Anderson, Ind. It appears in two models, model C for pleasure cars and model T for commercial cars, the chief difference between them being that model C is equipped with a dash control and a 30-mile dial, and the other is controlled by a lock and dial on the instrument itself, and has a range of but 20 miles.

The device consists substantially of a speedometer, which instead of indicating to the driver the variations of speed of the machine as caused by the uneven running of the engine and the varying resistance offered to the progress of the car by different conditions of the road, operates instead an auxiliary throttle valve in such a way as to accommodate the power of the motor to the load, thus causing the car to progress at a uniform rate of speed.

The speedometer portion of the device is connected to one of the front wheels by the customary gears and flexible shaft, and is equipped with an adjustable connection to the butterfly valve, so that when set for a certain speed any increase of speed will close the butterfly valve, and any decrease will open it. The adjustment is accomplished by means of a dial on top of the speedometer housing, which is provided with a lock and key and may be locked in any position.

At zero or open the valve may be locked for control by the regular throttle only. In use in touring such a device permits of a steady speed being maintained, regardless of any minor differences in road conditions or grades and without fear of stalling the motor; the clutch and steering, only, being required to control the running of the car.

As applied to commercial cars it can be locked at a certain speed, which the driver cannot exceed, but which he could easily attain—under ordinary road conditions—without running the motor to its utmost capacity, as is necessitated by governors geared to the engine. The regular throttle, of course, can be used to limit the speed below that at which the controller is set, but no movement of the throttle can cause the car to exceed this limit, it is asserted. It is applied between the manifold and the carbureter, no alterations being necessary to its application. It is shown in Fig. 5.

Adjustment on Connecticut Absorber

Greatly simplifying its attachment, the Connecticut Shock absorber, made by the Connecticut Shock Absorber Co., of Meriden, Conn., has been improved by the addition of a new adjustment. This absorber, shown in section in Fig. 3, oper-

FIG. 3—NEW ABSORBER ADJUSTMENT

New Things for the Motoring Public

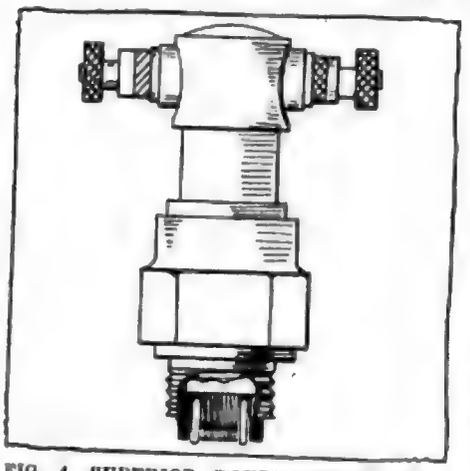


FIG. 4—SUPERIOR DOUBLE-POINT PLUG

ates on the spring and cam principle, and has previously been described and illustrated in these columns. This new adjustment consists of a milled clamp which fits the correspondingly milled casing of the device, rigidly clamping it to the inner shell, by means of an inversely disposed carriage bolt, by which means the two elements are adaptable to adjustment. When this clamp is loosened, the arms of the absorber are free to move in relation to one another, without affecting the position of the cam in reference to the springs; but when this clamp is tightened, all action is made through the shock-absorbing mechanism. To adjust these absorbers to a car, they are applied with the clamp loose, the car is loaded with weight equal to one passenger in excess of normal, and the clamps are tightened. Closer adjustment is made by adjusting the clamps with a lighter load, and looser adjustment is made by increasing the load at the time of adjustment. This improvement will be included with all of this company's product in the future.

Two-Spark Ignition Plug

On the theory that two sparks are better than one, the Superior Motor Specialty Co., of Philadelphia, Pa., has introduced the superior double-spark plug. Its claim is that these plugs will increase the power of an engine 17½ per cent, due to the fact that two points of ignition will facilitate flame propagation by decreasing the distance of flame spread. The theory being that each spark will ignite a different portion of the charge, thus cutting the lag in ignition approximately in two. The aim of this plug is to enable owners of motors equipped with but one spark plug tap to enjoy the advantages of two-spark ignition. They require no separate or extra timing device, as, when wired to a battery and magneto, the points may be used either singly, as a dual system, or simultaneously as a double system. The spark points are inclosed within the shell, and are claimed to be self-cleaning. As shown in Fig. 4, these plugs have two electrodes, with binding posts on either side of the upper portion, and horizontal. The construction other than the unique design is standard throughout. It is claimed that these plugs will last longer than other types, and that they are the only ones on the market which may be used for double sparking without additional mechanical equipment.

Combination Gas and Electric Headlight

The P. G. N. combination gas and electric headlight of recent introduction is designed to furnish two distinct lighting systems in the same housing. They may be used separately or both at the same time. The combination consists of a gas burner and a reflector and an electric fitting with parabolic reflector above. Connections for both gas and electricity are supplied and the lamp is finished in nickel, enamel, or combinations of the two. It is manufactured by J. R. Pagin Lamp Co., Valparaiso, Ind.

Oscillating Valve-Grinder

Hailing from London, the Warrow reciprocating valve-grinder, manufactured by Brown Brother, Ltd., of London, Eng., consists of a revolving shaft operated by bevel gears from a hand crank, similar to an ordinary breast drill. The difference is that the shaft terminates in a screw-driver bit instead of the usual chuck, and the bevel driving gear, to which the crank is attached, it without half its teeth. The small driven bevel pinions, being opposed, are driven in opposite directions as the teeth of the driving gear engage them individually, producing a reciprocating or oscillatory movement, which is produced by a continuous rotation of the crank. The device is illustrated in Fig. 6.

Flexible Metal Conduits

Flexible tubing has been used for horn tubes and speedometer shaft casings until every motorist knows its value, but it is not until recently that its value in other lines has been taken advantage of to any extent. Recently it has been used extensively for the conduction of hot air to carbureters, for auxiliary control connections and for exhaust. Newer uses are for the conduction of gas for headlights and air for tires, while lately its use for the protection of insulated wires, of which the modern motor car has such a multiplicity, has been greatly agitated. In response to this demand, the American Metal Hose Co., Waterbury, Conn., has brought

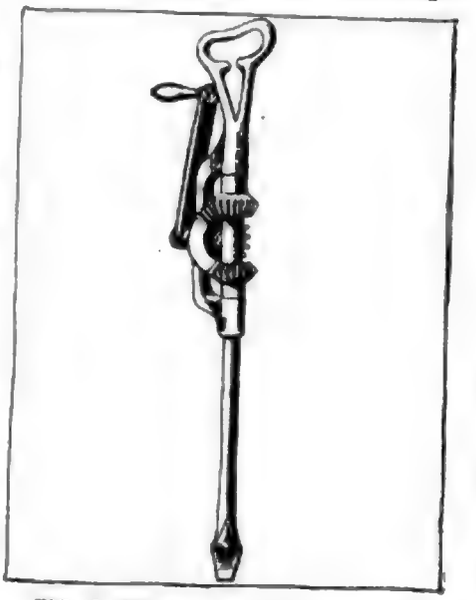


FIG. 6—WARROW VALVE GRINDER

out, in addition to a very complete line of flexible steam, oil, air, gas, water and special tubing, a new line of electric conduit tubing, of which three styles are shown in Fig. 2. Styles are shown for single wires, multiple wires, and special installations, where a heat, water and oil-proof covering is desired. The latter is asbestos packed, and is especially adapted to wiring near exhaust connections, in oily places, or where exposed to the weather. The other types shown are unpacked, of the interlocking and one-piece types.

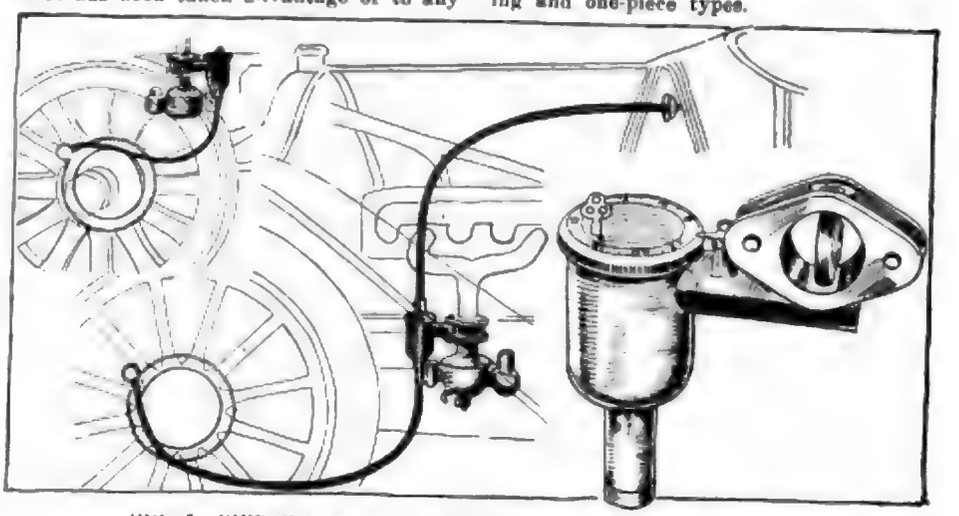


FIG. 5—PIERCE SPEED CONTROLLER AND ITS APPLICATION

Brief Business Announcements

Recent Agencies Appointed by Car and Truck Manufacturers

PLEASURE CARS

Town—	Agent	Make
Akron, Ind	Karl B. Gast and A. A. Gast	R. C. H.
Albuquerque, N. M	E. L. Bradford	R. C. H.
Alexandria, La	W. H. Ratcliffe	R. C. H.
Baltimore, Md	Baltimore Garage Co.	Keeton
Batavia, N	Robert L. Hiller	R. C. H.
Bayonne, N. J	W. H. Dykeman	R. C. H.
Bay Ridge, N. Y	Charles Frederick	Henderson
Bordentown, N. J	Samuel F. Garrison	R. C. H.
Boston, Mass	Fred A. Dutton Co.	Abbott-Detroit
Boston, Mass	J. S. Harrington & Co.	Flanders
Boston, Mass	Lozier Motor Car Co.	Paige-Detroit
Bristol, Tenn	Cannon Electric Co.	R. C. H.
Buffalo, N. Y	Progressive Motor Car Co.	Michigan
Burlington, N. J	Cortland L. Fort	R. C. H.
Canton, Ill	Meade McClatchey	Henderson
Carlsbad, N. M	Carlsbad Auto Co.	R. C. H.
Carlton, N. J	Middleton Motor Co.	R. C. H.
Charleston, S. C	Automobile & Marine Motor Co.	R. C. H.
Chicago	J. G. Tennant & Co.	Henderson
Chicago	F. Ebann	R. C. H.
Chicago	W. G. Sporleder	R. C. H.
Decatur, Ill	G. F. Wisegarver	R. C. H.
Denver, Colo	Colorado Cartercar Co.	Cartercar
Deming, N. M	Crescent Garage	R. C. H.
East Orange, N. J	Harold C. Slater	Henderson
Edmonton, Can	Standard Motor Co., Ltd.	Henderson
Elyria, O	Jackson & Harrison Auto Sales Co.	Harford
Enderlin, N. D	W. J. Baribean	R. C. H.
Fall River, Mass	F. W. Davis & Sons	Henderson
Fresno, Cal	L. E. Crider	Henderson
Fresno, Cal	E. W. Johnson Co.	R. C. H.
Gilroy, Cal	McKenney & McKenney	R. C. H.
Golden, Ill	Thesen & Gronewald	Henderson
Grand Salene, Tex	B. W. Carrington	R. C. H.
Green City, Mo	Boyce & Born	R. C. H.
Hardinsburg, Ind	May & McPheeters	R. C. H.
Houston, Tex	Northrupp & Clark	R. C. H.
Howard, Pa	Jackson Kline	R. C. H.
Hubbard, Ia	Elmer S. Maine Co.	Henderson
Huntington, N. Y	Walter H. Flessel	R. C. H.
Indianapolis, Ind	Finch & Freeman Auto Co.	Nyberg
Indianapolis, Ind	Finch & Freeman Auto Co.	Regal
Indianapolis, Ind	Finch & Freeman Auto Co.	Marathon
Inverness, Miss	Wallace & Tolar	R. C. H.
Jamestown, N. D	Wallace Donnelly Co.	R. C. H.
Janesville, Minn	E. Dieudonne & Son	R. C. H.
Joplin, Mo	C. H. Back	Hupp-Yeats
Lake Wilson, Minn	L. L. Grier and A. S. Peters	R. C. H.
Lancaster, Pa	Automobile & Supply Co.	Henderson
Lansford, N. D	Brunner & Chambers	R. C. H.
Las Animas, Colo	P. W. Pittman	R. C. H.
Le Roy, Kan	P. C. Jones	R. C. H.
Lindsay, Cal	E. C. Graham	Henderson
Lima, O	Central Garage	Little
Lima, O	W. E. Rudy	Chalmers
Live Oak, Cal	Henricksen & Smith	R. C. H.
Louisville, Ky	W. L. Lyons	Hupp-Yeats
Madison, Wis	Statz Motor Car Co.	Stoddard-Dayton
Madison, Wis	Statz Motor Car Co.	Cadillac
Madison, Wis	Statz Motor Car Co.	Studebaker
Mays Landing, N. J	Harry F. Birch	R. C. H.
Milwaukee, Wis	Jonas Automobile Co.	Cadillac
Minneapolis, Minn	Minnesota Cartercar Co.	Cartercar
Nacogdoches, Tex	Baker & Wilson	R. C. H.
Northport, L. I	D. & W. Lawson	Henderson
Ottawa, Kan	John Nelson & Son	R. C. H.
Petaluma, Cal	J. J. Tanner	Henderson
Pittsburgh, Pa	Forbes Motor Car Co.	Henderson
Plymouth, Ind	F. H. Kuhn	R. C. H.
Port Colborne, Ont	Guiding Star Bicycle Store	Metz
Portland, Ore	H. L. Keats Auto Co.	Detroiter
Rialto, Cal	J. W. Cramp	R. C. H.
Riverside, Cal	A. R. Riley	R. C. H.
Rochester, N. Y	A. Elliott	R. C. H.
Rockland, Me	Albert C. Jones	R. C. H.
Roswell, Ga	H. A. Walton and C. W. Ellington	R. C. H.
Roswell, N. M	Pecos Valley Auto Co.	R. C. H.
Sacramento, Cal	Sacramento Motor Sales Co.	Henderson
Santa Ana, Cal	Frank Vegely	R. C. H.
Scranton, Kan	Michael & Sappenfield Garage Co.	R. C. H.
Selma, Ada	S. H. Watts	R. C. H.
Shawhegan, Me	Clyde H. Smith Auto Co.	Cartercar
Souderton, Pa	Souderton Garage	R. C. H.
Spokane, Wash	H. J. Banta	Pierce-Arrow
Spokane, Wash	Gerlinger Auto Co.	Warren
Springfield, Mass	Forest Park Garage	Henderson
Stockton, Cal	E. E. Cross	Henderson
Swedesboro, N. J	H. F. Hunter	R. C. H.
Toronto, Ont	Matheson Sales Co.	King
Tucson, Ariz	Alfred S. Donau Auto Co.	R. C. H.
Utica, N. Y	L. H. Gardner	Cartercar
Utica, N. Y	I. R. Gardiner	R. C. H.
Washington, D. C	Storm Motor Car Co.	Hupp-Yeats
Watertown, Wis	Buroff-Fuller Motor Co.	Regal
Watertown, Wis	Buroff-Fuller Motor Co.	Overland
Wenona, Ill	H. L. Webber	R. C. H.
Wessington Springs, S. D	Western Machine & Motor Co.	R. C. H.
Wichita, Kan	C. A. Jones	R. C. H.
Williamsport, Ind	John E. Briggs	R. C. H.
Windsor, Ont	F. S. Evans	King
York, Pa	Auto & Truck Sales Co.	Henderson

TRUCKS

Town	Agent	Make
Atlanta, Ga	Cole Motor Co. of Ga.	Federal
Boston, Mass	F. E. Wing Motor Car Co.	Marmon
Buffalo, N. Y	Sanderson & Burghardt	Federal
Columbia, S. C	Gibbes Machinery Co.	Federal
Larned, Kan	W. S. Young	Federal
Melbourne, Australia	American Motor Truck & Auto Co.	Federal
Memphis, Tenn	John F. Cubbins	Federal
Mobile, Ala	Mobile Auto Co.	Federal
Montreal, Can	Pope-Hartford Motor Co.	White
New Orleans, La	Fairchild Auto Co.	Federal
Pittsburgh, Pa	Union Motor Car Co.	Federal
Watertown, Wis	Buroff-Fuller Motor Co.	Chase

PORT HANEY, B. C.—A garage is being built here by Charles Pellitier.

Toronto—Captain C. A. Boone has completed plans for the construction of a large garage at 159-161 Richmond street west.

Milwaukee, Wis.—Benjamin Margoles, W. A. Nash and R. M. McKay, of Milwaukee, Wis., have organized the Badger Oil and Specialty Co., which has been incorporated under the laws of Wisconsin with a capital of $25,00.

Boston, Mass.—The Boston branch of the Buick company has been moved to the salesrooms on Massachusetts avenue and Newbury streets just vacated by the Oldsmobile company, the latter going to its new building. The Buick manager decided not to wait until the addition to the salesrooms was completed when he found that the work was delayed and would not be done for more than a month.

Galt, Ont.—A. E. Dunn has opened a new and more commodious garage.

Calgary, Alta.—The Sayer Auto Co. has taken over the Motor Mart garage on Sixteenth avenue. A charging station for electric cars is being installed.

Springfield, Ill.—The Sangamon Electric Co. expects to take possession of its new building this month which will add 20,000 square feet to the capacity of the plant.

Milwaukee, Wis.—The Jonas Automobile Co., 421 Wells street, Milwaukee, will on October 15 take possession of the new Cadillac building now being erected for the firm at the corner of Eighth and Wells streets. The new structure will be devoted exclusively to the sale and service of Cadillac cars, which the Jonas company has represented continuously for 11 years in Milwaukee and the surrounding territory.

Saskatoon, Sask.—The Clinton Motor Co. is negotiating regarding a site here.

Vancouver, B. C.—The announcement is made of J. G. Cline's appointment to the sales branch of the Vancouver branch of the Ford Motor Co.

Toledo, O.—The Ford Brothers Co., agent for the Michigan, has added the Krit line and will represent fourteen northwestern Ohio counties.

Racine, Wis.—The Wadewitz Machinery Co., of Racine, Wis., incorporated a few weeks ago with $50,000 capital, is establishing an experimental shop at Racine for the practice of motor car engineering and the manufacture of devices for the general mechanical engineering field. One of the principal devices already perfected and to

be manufactured without delay is a spring starter for motor car engines.

Port Credit, Ont.—Plans have been filed for a garage to be erected here for C. H. Gordon.

Atlanta, Ga.—The Studebaker Corporation has arranged for a four-story, fireproof building at the corner of Peachtree and Harris streets for its Atlanta branch.

Niagara Falls, Ont.—A new garage has been opened here on Bridge street, next to the Windsor hotel, by Robert Hamilton, who is the local agent for the Studebaker line.

Winnipeg, Man.—The Reo agency has been transferred from Joseph Maw & Co. to Percy Plewes. Mr. Plewes was previously in charge of the sales department of Maw & Co. for 13 years.

Boston, Mass.—The Paige-Detroit is no longer handled in Boston by the Morse Motor Car Co. It is now being marketed from the Lozier salesrooms under the direction of the Lozier branch.

Boston, Mass.—The Berkeley Motor Car Co. has just been formed in Boston by J. H. Freeman, formerly with the Cadillac, as manager, and George Tollman of the Chalmers, to deal exclusively in used cars.

St. Catherines, Ont.—The Reo Sales Co., of St. Catherines, has made arrangements with the Reo Motor Car Co. of Canada, of St. Catherines, whereby it has become the sole selling agent for the Reo throughout the dominion of Canada.

Boston, Mass.—John S. Harrington & Co., Boston agents for the Flanders gasoline cars, has taken on the agency for the Flanders electric for New England. It was formerly sold here through a branch but this was discontinued some months ago.

Washington, D. C.—The Potomac Motor Car Co., agent for the Marmon, has taken temporary quarters at 1313 H street, northwest, pending the completion of its new salesrooms at 1226 Connecticut avenue, northwest. The building will be ready for occupancy November 1.

Toledo, O.—The Moore Motor Truck Co.'s line of commercial vehicles has been placed on sale by Fred Kopf, Toledo sales agent. Following are the officers of the Toledo company: President and manager, T. E. Moore; vice-president, F. B. Adams; secretary and treasurer, D. W. Bliss; superintendent, C. W. Blanchard. The company is figuring on building large shops near Toledo.

Racine, Wis.—Leo A. Peil, president and general manager of the Mitchell Automobile Co., Racine, Wis., has been appointed general sales manager of the Mitchell-Lewis company to succeed William L. Day, who has resigned to accept the position of general manager of the General Motors Truck Co., at Pontiac, Mich. Mr. Day came to Racine in April, 1911, to succeed James Gilson as general sales manager. Mr. Peil assumes his new duties on September 1. No change will be made in the management of the distributing concern of which he is the head.

Moose Jaw, Sask.—The Canadian Garage Co. is building a fine garage at a cost of $25,000.

Pembroke, Ont.—The Thomas Pink Co., Limited, has added to its already large premises a motor garage where all kinds of repairs will be made.

Montreal—The Gutta Percha Co. of Canada, dealer in rubber tires for motor cars, has purchased outright the business of the Rubber Tire Wheel Co. of Montreal.

Canton, O.—A building permit has been issued for the erection of a $10,000 plant on Deuber avenue, for the Cleveland-Canton Spring Co., which will make all kinds of vehicle springs.

Toronto—G. L. Mitchell has resigned the managership of the Toronto branch of the Diamond Rubber Co. to become partner in the Republic Rubber Co., Detroit, Mich.

St. Catharines, Ont.—The Reo Sales Co., St. Catharines, has completed arrangements with the Reo Motor Car Co. of Canada whereby the former concern secures sole selling rights for the Reo in Canada.

Portland, Ore.—H. A. Jurgewitz has been appointed Portland manager of the Goodyear tire branch. He succeeds W. T. Powell, who has been made Pacific coast district manager for the Goodyear people, with headquarters in San Francisco.

Milwaukee, Wis.—The Lozier Livery Co. has been organized and incorporated for $25,000 to operate a motor livery service. Richard H. Knowles is president and general manager, and with him are associated in the enterprise R. P. Druecker and F. W. Loomis.

Boston, Mass.—Frank J. Tyler and his brother Lucius, the former manager of the United Motors Boston Co. for some years and the latter manager of the Maxwell branch until recently, have formed the Tyler Motor Car Co. to handle cars and trucks in New England with headquarters at Boston.

Vancouver, B. C.—The two-story garage which is being built for the McLaughlin Carriage Co., Ltd., on Georgia street, between Butt and Jarvis streets in Vancouver, is nearing completion. The building is 66 feet by 132 feet and was started last March. It is of reinforced concrete construction, entirely fireproof and brick-faced.

Buffalo, N. Y.—The A. W. Haile Motor Co., capitalized at $25,000, has been incorporated. Directors of the new corporation are Arthur W. Haile, Bradley H. Phillips and E. C. Schlenker, all of Buffalo. Arthur W. Haile, president of the new motor company, for the past 2 years has been local sales agent for Studebaker and has received notice from the Studebaker corporation of Detroit, Mich., that he is to continue the selling end for Studebaker cars in Erie and Niagara counties.

Edmonton, Alta.—The Motor Accessories Co. has commenced business in this city.

Owen Sound, Ont.—W. J. Linden and James Newton have opened a large garage on Ninth street.

Vancouver, B. C.—The H. W. Welsh Auto Co. has opened a salesroom and garage at 837 Pender street west, where it is featuring the Chalmers.

Hull, Que.—The provincial government of Quebec has granted the charter which was applied for by the Hull and Ottawa Garage Co., with headquarters here, recently.

Omaha, Neb.—Tom Bromwell, who for several years has been sales manager for the H. E. Fredrickson company, has resigned to accept a like position with the Nebraska-Cartercar Co.

Victoria, B. C.—The Vancouver Island Auto Co., of this city, has been succeeded by the Vancouver Motor Co., Ltd.

Toronto—The Matheson Automobile Co. with temporary showrooms and garage at 170-176 Victoria street while its own garage is building, is sole Canadian distributor for the Norwalk and Nyberg cars.

Detroit, Mich.—George H. Wahl, for 5 years with the Ford Motor Car Co., has taken the Michigan state agency for Rambler cars. He has quarters formerly occupied by the Chalmers Motor Co.'s retail branch on Jefferson avenue.

Boston, Mass.—The Edison battery agency, formerly handled in Boston by the S. R. Bailey Co., maker of Bailey electrics, at 895 Boylston street, is now being handled in Boston by the Herbert S. Potter Co., 24 Commerce street, with George Holden as manager.

Springfield, Mass.—The Essenkey company of Chicago that recently opened a place in Boston has done so well that salesrooms for the product have been opened now at Springfield, Mass., at the corner of Fort and Water streets. It is known as the Western Massachusetts Essenkay Co.

Portland, Ore.—Portland is experiencing many changes on motor row. Many agencies have changed, or are about to change hands. New agencies have been formed and one firm has taken on an entirely new car in the Oregon territory. Probably the most important change is the establishing in Portland of a factory branch of the Pierce-Arrow. Howard M. Covey, who has handled this line in Portland for several years, will in the future confine himself exclusively to the Cadillac line. S. G. Colter, who has had charge of the Pierce-Arrow department for Mr. Covey, will have charge of the Pierce branch and will occupy new salesrooms and garage until the factory is completed. W. H. Gray, formerly manager of the Diamond tire branch in Portland, has resigned to associate himself with Fred Vogler in the handling of

Hudson and Reo cars. The Hudson was formerly handled by Neate & McCarthy.

Picton, N. S.—Dodd Dwyer has opened a garage on Creighton street. He also has the local Ford agency.

St. Paul, Minn.—Denial is made by Smith & Heberle that they have taken the Hudson agency for Minneapolis. They handle only the Chalmers.

Davenport, Ia.—R. E. Beedoe of this city has accepted the position of assistant general manager of the St. Louis branch of the Wilcox Motor Car Co. of Minneapolis.

Montreal—The Automobile Owners' Exchange is the name of a concern recently established at 730 Dorchester street west, to handle accessories. J. J. Hoag has been appointed sales manager.

Vancouver, B. C.—In a few days work will commence on the erection of a two-story fireproof garage, to be erected in the 1200 block on Hornby street for H. Hemlow. The structure will cost $30,000.

Detroit, Mich.—The Michigan State Automobile School has just been incorporated with a capital of $10,000. The school is situated at 11-13-15-17 Selden avenue, and has been in operation for a year and a half.

Omaha, Neb.—F. W. Kemp, formerly with the E. K. Wilson Auto Co., has taken the management and a third interest in the Independent Auto Repair Co. D. J. O'Brien and Adolph Storz are the others interested. Mr. Kemp will also look after the sales department of the Firestone-Columbus Motor Car Co.

Winnipeg, Man.—A contract has been closed between the Canadian Fairbanks-Morse Co. and the International Motor Co. of New York for the sole Canadian representation of Mack trucks. The agreement between the two companies provides for the establishment of a chain of service stations throughout Canada, the principal of which will be at Montreal, Toronto, Winnipeg and Regina. The Winnipeg station will be built immediately and the control of the plant will be under the direct supervision of C. J. Britton, manager of the western Canada business of the Canadian Fairbanks-Morse Co.

Port Arthur, Ont.—A fireproof garage, constructed of brick and concrete, has been opened on Park street by W. Foote.

Coshocton, O.—Snyder & Senft have purchased the garage and sales agency on Third street, Coshocton, formerly conducted by Charles W. Loos & Sons.

Portland, Ore.—The Ford company has secured space in the Paquet building at East Eighth and Hawthorne streets for the purpose of establishing a factory branch October 1.

Montreal—J. W. Baillargeon, president of the Autobus Co., has been chosen president of the Fearless Tire Co., organized to manufacture and market a leather tread steel-studded tire.

Racine, Wis.—The Anderson Brothers garage at Racine, Wis., has been purchased from William Anderson by Paul Klauder and Emil Hansen. The garage and repair shop facilities will be increased at once.

Detroit, Mich.—Henry Lumbach, assistant engineer of the R. C. H. Corporation, has resigned to accept a position with the Studebaker Corporation as chief tool maker. His resignation took effect September 1.

Columbus, O.—The Columbus Auto Inn located at High street and Seventh avenue, has completely renovated the garage and salesroom at that place. The concern consists of two floors and the equipment is complete.

Tacoma, Wash.—The A. S. French Auto Co., the Columbia Taxicab Co., the Vancouver Transfer Co. and the Victoria Transfer Co. of British Columbia have recently consolidated with a capitalization of $500,000. The new company will be known as the Pacific Auto Co., with E. H. Heaps, who formerly was head of two of the companies, president of the new concern. The new company will maintain a taxicab service in Vancouver and Victoria, and it also is probable that a similar service will be inaugurated in New Westminster. The following have been named as directors: Noel Humphreys, managing director, G. M. Gibbs, A. S. French and J. L. Langan.

Toledo, O.—The Saxon Mfg. Co. has established a branch at 1219 Woodward avenue. I. E. Lowenberg, manager.

Toronto—The K. and S. Tire Co., Yonge street, has been appointed sole distributor for the dominion of Canada for the Kelly-Springfield motor truck tires.

Cleveland, O.—The Marathon Tire and Rubber Co. of Cleveland, O., has filed papers with the secretary of state increasing its capital stock from $10,000 to $100,000.

Seattle, Wash.—The new Stutz agency in Seattle will be located in the new Lozier building at 909 East Pike street. The agency will be handled by W. P. Brawley and C. H. Moore.

Vancouver, B. C.—Work has been started on the reinforced concrete frame of the fireproof garage that is being erected on the corner of Thurlow and Georgia streets for the Begg Motor Co.

Montreal—The Peerless Tire Co. has formed in Montreal, headed by J. W. Baillargeon, president of Autobus Co., and J. A. Michaud, of the Vinot Car Co. of Canada, to manufacture and market tires.

Boston, Mass.—Manager C. S. Wheeler of the Boston branch of the R. C. H. has moved the service station of the branch from 148 Berkeley street to 16 Harcourt street, a more convenient location with larger space.

Utica, N. Y.—The Bossert Co., maker of sheet steel stampings, is constructing an addition two stories in height, the upper floor to be used for offices. This concern recently installed an autogenous welding plant and is increasing all departments.

Toronto—Gerard Muntz, director of the Schacht Motor Car Co. of Hamilton, has been chosen president of Consolidated Motors, limited, which has located its new establishment at 112-116 Richmond street west. Consolidated Motors has secured agencies for the Panhard car, Detroiter, Motor Wagon and the Schacht car.

Recent Incorporations

Augusta, Me.—Hallett Vehicle Tire Co., capital stock, $500,000; to manufacture, sell and deal in rubber articles; incorporators, L. J. Coleman, E. Perry.

Augusta, Me.—United Motor Equipment Co., capital stock, $1,000,000; to manufacture, sell and deal in motors, etc.; incorporator, E. M. Leavitt.

Baldwin, N. Y.—Auto Rental Co., capital stock, $5,000; directors, G. Wentjen, A. Meiselbach, A. C. Ewing.

Boston, Mass.—Standard Auto Supply Co., capital stock, $100,000; incorporators, M. F. Culliney, E. W. Shepherd.

Boston, Mass.—Fenway Garage Co., capital stock, $250,000; incorporators, J. C. Cannon, C. W. Engle.

Chicago—Parker Motor Co., capital stock, $5,000; to manufacture motors; H. W. Schnetzky, F. D. Parker, A. E. Cole.

Chicago—Hart Motor Car Co., capital stock, $25,000.

Chicago—Republic Motor Co., to manufacture and sell engines and appliances; incorporators, W. H. Watson, L. E. Powell, P. H. Guilfoil.

Elizabeth, N. Y.—Franklin Auto Co., capital stock, $25,000; incorporators, W. H. Reynold, M. Gordon, L. Koplan.

Indianapolis, Ind.—Hydraulics Transmission Co., capital stock, $200,000; to manufacture transmissions; directors, W. K. Ensat, P. Milhilland.

Indianapolis, Ind.—McLellen Auto Shop, capital stock, $50,000; to deal in motor cars; directors, E. J. Kane, F. E. Birret, T. E. Byrne.

Indianapolis, Ind.—Mais Motor Truck Co., capital stock, $1,000,000; incorporators, W. M. Pearce, A. S. Lockard, W. H. Brown.

Lansing, Mich.—Boucher & Coffman Auto Company.

Nashville, Tenn.—Cumberland Motor Co., capital stock, $10,000; incorporators, W. D. Caldwell, J. H. Check, J. O. Check, Jr.

New York—Triple Action Carburetor Co. capital stock, $200,000; to manufacture carbureters, motors; directors, M. Walwoda, F. Hodschar, E. F. Driggs.

New York—Curran Patent Co., capital stock, $10,000; to manufacture motors, etc.; directors, H. L. Curran, C. H. Wilson.

New York—People's Motor Sales Co., capital stock, $15,000; to deal in motor cars and conduct a garage; directors, J. T. Shultz, F. H. Humphries, A. L. Allen.

New York—Volkmar Mfg. Co., capital stock, $100,000; to manufacture automatic starting devices; directors, E. Giegerich, B. Volkmar, W. H. Giegerich.

Pittsburgh, Pa.—Universal Shoe and Forge Co., capital stock, $50,000; to manufacture motor car parts; C. H. Ehares, president.

Stanford, Tenn.—Osceola Garage Co., capital stock, $10,000; incorporators, H. Clay, C. Hyatt, J. J. Griffin.

Union, N. J.—Ideal Auto Garage Co., capital stock, $100,000; incorporators, E. F. Smith, F. W. Ritter, W. G. McLoughlin.

Wilmington, Del.—Overman Tire Co., capital stock, $3,000,000; to manufacture motor cars; incorporators, E. E. McWhitney, N. P. Coffin, H. E. Latter.

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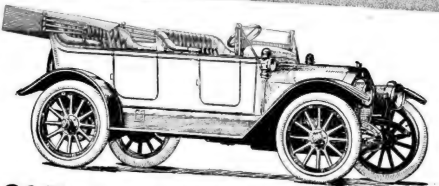
MOTOR AGE

VOLUME XXII CHICAGO, SEPTEMBER 12, 1912 NUMBER 11



1913's Remarkable Car Value—the Big, Handsome Maxwell "40"

Fully Equipped, $1675

We have built a finer Maxwell than ever before. It embodies the very latest refinements; is large and powerful; and retains all the thoroughly proved Maxwell mechanical features. The detailed value crowded into this new model, summed up, make it easily the leader among all cars under $2500.

NOTABLE FEATURES

- **Left hand drive**
- **Center control**
- **Long stroke silent motor**
- **Selective transmission**
- **116-inch wheelbase**
- **36-inch wheels**
- **Demountable rims**
- **French design body**
- **Black and nickel trim**
- **Metal bodies—24 coats of paint and varnish**
- **Roomy tonneau**
- **Turkish cushions**
- **Two front doors**
- **Effective dash ventilators**
- **Self-starter**
- **Stylish Mohair top and side curtains**
- **High grade lamp equipment**
- **Electric lights**
- **Concealed horn**
- **Tire carrier and protector**
- **Extra tire rims**

The "40" is made in two body styles. The Touring Car, $1675, and the Roadster, $1625. We also make a "30" Touring Car, $1145, and Roadster, $1110; a "22" Roadster, $785. All cars fully equipped, prices f. o. b. factory.

You should buy a Maxwell because It holds the world's speed record in its class. It is the national touring champion—winner of the Glidden Tour. It lasts longest—proven by actual State registrations. It costs less to maintain—proven by public demonstration.

Deliveries Now Dealers everywhere are prepared to make deliveries at once. We will be glad to send you the advanced Catalogue for 1913. Write for it.

United States Motor Company
Maxwell Division
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America's First Car Still Its Foremost

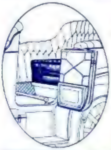
Electric Starting HAYNES Electric Lighting

A BIG, powerful, roomy motor car. So graceful in its lines and so beautiful in its finish that no car can surpass it in appearance and style. So complete in its appointments and its provisions for comfort that we know of nothing which could be added. Luxurious in its twelve-inch deep, fine hair cushions. Quiet and handsome. Always ready to start—right from the driver's seat—without the turn of a crank. Sturdy, for years of service.

Such, in brief, is the newest Haynes, Model 22. The demand for this perfect, complete automobile—into every part and every line and every feature of which has been built nineteen years of Haynes experience—has been instantaneous and insistent.

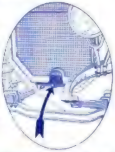
America's oldest car—America's first car—is now truly America's first car in point of efficient completeness and the luxury of the car. The Haynes Company has not trimmed its quality of workmanship in a single detail. On the contrary, there has been a betterment, made possible by the almost daily improvement of factory equipment and manufacturing processes. In quality of materials and workmanship—in all the little details of mechanical precision—the newest Haynes equals or excels any of the previous Haynes Models which have so firmly established Haynes character—and Model 22 offers much that no previous Haynes or any other car ever has offered. It has true beauty of design; such roominess as you never saw in any other automobile; the very extreme of comfort, to please those who seek luxury; and an electric starting and electric lighting equipment of utmost simplicity and absolutely 100 per cent efficiency.

Every Possible Provision for Comfort and Ease of Operation



It is quite impossible to express fully by illustration the luxury of Haynes Model 22 upholstery. The cushions, slightly tilted downward at the rear, are of fine hair and TWELVE INCHES THICK, the deepest cushions ever used in American cars. All our upholstery is of our own manufacture and the covering is finest hand buffed leather.

There is no crank on the new Haynes. And no need for one, for the starter really starts the Car. Note the sturdy, graceful lines of radiator, frame and axle—all reflecting that distinguished character which you see in every Haynes, and that character which you could only expect to find incorporated in higher priced cars.



DETAIL OF SPECIFICATIONS:

Haynes T-Head motor, 4½ in. x 5½ in., 40 h. p., wheel base 120 in.; fine hair upholstery, 12 inches deep; tires, 36x4½ in.; absolutely 100 per cent efficient electric starting equipment of utmost simplicity; Eisemann dual magneto, Stromberg carburetor, Warner autometer, demountable rims, top, windshield, electric signal horn, electric cowl lamp, standard bumper, etc., etc. Touring car models, $2250; Roadster, $2250; Coupe, $2750; Limousine, $3400; Berlin, $3500., f. o. b. factory. For catalog, address

Haynes Automobile Co., 501 Union St., Kokomo, Ind.

FACTORY BRANCHES IN NEW YORK, CHICAGO, SAN FRANCISCO, INDIANAPOLIS


Ground
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Andrews Condensing Dryer

(Patented)

The advantage of drying varnish at higher temperatures in our room, as compared with the old-time air drying, is being generally appreciated and understood by the automobile manufacturer. We are drying varnish on wood, fabrics, paper and steel without one complaint on the quality of our work. The Sterling Company, of Derby, Conn., piano manufacturers, in an interview published August 17th in The Music Trades, states our process has saved them fifty days in the drying of piano cases and gives them a more cohesive and brilliant finish. While the brilliancy of the finish may not be as important to the motor manufacturers, the wearing of the varnish is.

The demand has been large for this room. We have reduced its cost nearly one-half by the use of a gypsum wallboard, which, after water-proofing, meets every requirement. We control the manufacture of this wallboard for drying construction and it should not be confounded with other wallboards. Its interior is gypsum and wood fiber, covered at either side with a thick compound similar to asbestos paper, the outer surface being strengthened as well as water-proofed by our preparation.

We are the only manufacturers installing a varnish drying-room complete in perfect economy of operation and construction at a moderate price. Our later patent, No. 1,036,323, showing our improvement on this room, makes the fourth issued us on Condensing Dryers.

CAUTION! We own the only patent in a condensing method ever issued by the Patent Office, showing steam pipes on one side and condensing pipes on the other. We were the first to employ this construction. You can hardly expect us to give our discoveries to others free. If you are using this method not purchased of us, we shall ask you to pay the owner.

One implement manufacturer, using 150,000 square feet of floor room for painting and varnishing, will have 125,000 square feet of this to use for other purposes by employing our process. We are glad to quote you either for the apparatus and license to operate or will, if you desire, install the rooms complete. With a different arrangement of piping, we use the same room for drying lumber and veneered stock. We have increased our manufacturing facilities and, while we like from thirty to sixty days' notice, our customers so far have experienced very little delay; but if you have not already installed you should order promptly.

The A. H. Andrews Company

115-117 South Wabash Ave., Chicago, Illinois

0. 11 CHICAGO, SEPTEMBER 12, 1912 $3.00 PER YEAR

OTOR AGE

Merchants Gather at Milwaukee

VANDERBILT GRAND PRIZE AND PABST TROPHIES OFFERED FOR MILWAUKEE COMPETITION

'anderbilt and s Next Week

, Sept. 10—For the
from their native
of the Automobile
the W. K. Vander
ntested for in the
over a brand new
the town of Wau
ty, Wisconsin, pro
Automobile Deal

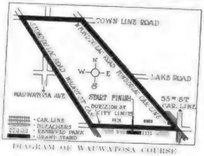

DIAGRAM OF WAUWATOSA COURSE

New Course at Wauwatosa Built for the Big Road Races

it. In obedience to the requirements of the governing bodies, the A. A. A. and A. C. A., there will be an interval of 2 days between the grand prix and the next event, which will be double light-car bill, and 3 days between the features.

For this, the first international racing competition in the very heart of the American continent, as convenient of approach **from the Pacific as from the Atlantic coasts and intervening territory, the promoter, the M. A. D. A., has hung up $20,250 in gold coin to supplement the valuable gold cups as prizes.**

Approximately $25,000 has been distributed over a circuit of a little less than 8 miles of the finest country highways to be found in the vicinity of Milwaukee, forming a cup race course, which, although entirely new, should

STRAIGHTAWAY ON TOWN LINE ROAD READY FOR OILING

MAGNIFICENT BEND AT CEMETERY TURN, WHERE WALNUT STREET CAR LINE ENDS

have unlimited possibilities of speed, at the same time offering opportunity for spectacular work to satiate the hunger of the thousands of newly-made road racing enthusiasts whose knowledge of cup competition has been gained from reading the accounts of the Long Island and Savannah races of past years.

Friday, the 13th, despite its association with jinx and hoodoos, has been set as the day for the opening of the course to the drivers for first practice. This leaves but 4 days of practice running, but the pilots already here believe this sufficient, as all who run in the last three events will have 2 additional days for tuning up after the grand prix is run.

List of Probable Starters

Although entries for the grand prix closed Tuesday night, nothing like a complete list of contestants in the first event, nor in any of the other events, will be available until Thursday evening, when Official Starter Fred J. Wagner, who is handling the entry list for the M. A. D. A., arrives in Milwaukee. The known entries for the grand prix already filed in Race Manager Ruddle's office, together with checks to cover the entry fee, are as follows:

Car and entrant	Driver
Benz 1911 racer, Erwin Bergdoll	Bergdoll
Benz, E. A. Moross	Burman
Benz, Benz Import Co.	Not named
Fiat 70, E. E. Hewlett	Tetzlaff
Fiat 90, Fiat Auto Co.	Bruce-Brown
Fiat 90, Fiat Auto Co.	Bragg
Mercedes, E. J. Schroeder	De Palma
Mercedes, Spencer Wishart	Wishart
Mercedes, W. H. Bertrand	Clark
Mercer, Mercer Auto Co.	Hughes
Knox Six, Ralph K. Mulford	Mulford
Cino, Haberer & Co.	Jenkins

Manager Ruddle stated late last night that Starter Wagner wired Tuesday afternoon that he expected to close up several more entries before the closing hour, making a total list of seventeen or nineteen cars in the grand prix.

The Vanderbilt list will not close until Saturday night, September 14, but the M. A. D. A. already has these cars and drivers on the books for the September 21 event:

Benz, Benz Auto Import Co.	Burman
Benz 1911 racer, Erwin Bergdoll	Bergdoll
Case, J. I. Case T. M. Co.	Disbrow and Nikrent
Case, J. I. Case T. M. Co.	Jagersberger and Bill Endicott
Cino, Haberer & Co.	Jenkins
Fiat 70, E. E. Hewlett	Tetzlaff
Fiat, Fiat Auto Co.	Bruce-Brown
Fiat, Fiat Auto Co.	Bragg
Mason Spl., F. S. Duesenberg	Roberts
Falcar, Fal Motor Car Co.	Trussel
Falcar, Fal Motor Car Co.	Hastings
Knox Six, Ralph K. Mulford	Mulford
Lozier Six, Richard H. Knowles	Nelson
Stutz, Ideal Motor Car Co.	Merz
Stutz, Ideal Motor Car Co.	Anderson
Mercer, Mercer Auto Co.	Hughes
Mercer, Mercer Auto Co.	Wishart
Mercedes, E. J. Schroeder	De Palma
Mercedes, W. H. Bertrand	Clark

For the Pabst and Wisconsin Challenge competitions, to be run co-incidentally on Friday, September 20, the entry lists close Saturday night, and at present Manager Ruddle has a very incomplete enrollment to report. Among the entrants will be:

PABST TROPHY

Car and entrant	Driver
Case, J. I. Case T. M. Co.	Disbrow
Case, J. I. Case T. M. Co.	Jagersberger
Cino, Haberer & Co.	Jenkins
Falcar, Fal Motor Co.	Hastings
Falcar, Fal Motor Co.	Trussel
Mason Spl., F. S. Duesenberg	Roberts
Mercer, Mercer Auto Co.	Hughes
Mercer, Mercer Auto Co.	Pullen
Mercer, Mercer Auto Co.	Wishart

WISCONSIN CHALLENGE TROPHY

E-M-F, Studebaker Corp.	Witt
E-M-F, Studebaker Corp.	Evans
Mason, F. S. Duesenberg	H. Endicott
Mason, Mason Auto Co.	Roberts
Mason, Mason Auto Co.	Not named

Course Easy to Reach

The course is the easiest of access from the center of population that has ever been provided for either Vanderbilt or grand prix. In fact, one corner of the circuit touches the northwestern city limits of Milwaukee, and the home stretch runs along the city limits for about ¼ mile. The course is directly approached by three trunk street car lines, one of

HISTORY OF THE GRAND PRIX AND VANDERBILT CUPS

GRAND PRIZE

Year	Distance Miles	Starters	Finishers	Winner	Time	Miles per Hour
1908	402	20	9	Wagner, Fiat	6:10:31	65.111
1909—No race						
1910	415	15	8	Bruce-Brown, Fiat	5:53:05	70.55
1911	411.36	14	5	Bruce-Brown, Fiat	5:31:29.13	74.47

VANDERBILT

Year	Distance Miles	Starters	Finishers	Winner	Time	Miles per Hour
1904	284.4	18	2	Heath, Panhard	5:26:45	52.2
1905	283	20	4	Hemery, Darracq	4:38:08	61.4
1906	297.1	18	5	Wagner, Darracq	4:50:10	60.8
1907—No race						
1908	258.6	19	2	Robertson, Locomobile	4:00:48	64.3
1909	278.08	15	2	Grant, Alco	4:25:42	62.8
1910	278.08	30	10	Grant, Alco	4:15:58	65.18
1911	291.38	14	6	Mulford, Lozier	3:56:00.67	74.07

SHOWING HOW SHARP SOMERVILLE TURN AT NORTHWESTERN CORNER OF COURSE HAS BEEN CUT AWAY

which has been extended to the home stretch for the purpose.

The Fond du Lac avenue line, the downtown terminus of which is, for practical purposes, at the corner of Grand avenue and West Water street, runs directly to the southeastern corner of the course, while the Walnut street line, originating at Grand avenue and West Water streets, runs directly to the southwestern corner. The Thirty-fifth street north and south cross-ftown line, which is fed by twelve main city lines running due east and west across the city, meets the Fond du Lac avenue line at its terminus on the course. Center street and North avenue, two principal east and west cross-town lines which do not run into the downtown section, but approach the course, are fed by a dozen city lines. The Chicago, Milwaukee and St. Paul, the Chicago and North-Western and Chicago, Sparta and North-Western steam roads go around the course for practically two-thirds of its length.

Plenty of Accommodations

There will be accommodations for all who come, even if the crowds outnumber 150,000. The newspapers have opened registration bureaus for residents who have spare rooms, and already 8,700 rooms have been placed at their disposal. The aggregate number of rooms in the city hotels is in excess of 2,700, which, when swelled for purposes of handling crowds, can take care of 80,000 persons. Beds and cots in banquet halls, assemblies and other parts of the hotels not ordinarily used for sleeping purposes, will give good accommodations for every one who seeks a pillow.

Construction of the grandstands, judges' stands, press tower, bleachers, the pit sections, and other building work, was begun Sunday morning. The start and finish line is on Burleigh street, midway between the North and South Fond du Lac roads. The grandstands will be on the south side of the home stretch, the pits being directly in front of the box sections, on the right hand side of the drivers. The judges', press and administration buildings will be

PROGRAM FOR MILWAUKEE'S ROAD RACING CARNIVAL

GRAND PRIX

Date—Tuesday, September 17, 1912, starting at 10 a. m.

Distance—Fifty-two times around the 7.8 mile course, or approximately 409.86 miles.

Conditions—The race shall be run under the racing rules of the Automobile Club of America, and such additional rules as may be adopted by the contest committee of the A. C. A.

Entry Fee—One car, $1,000; two cars, $1,500; three cars, $1,750, of the same manufacture.

Prizes—To the winner, the grand prix, a gold challenge cup given by the Automobile Club of America, valued at $5,000, and $5,000 in gold coin given by the Milwaukee Automobile Dealers' Association; second prize, $2,500; third prize, $1,250; fourth prize, $750; and fifth prize, $500.

VANDERBILT CUP

Date—Saturday, September 21, 1912, starting at 11 a. m.

Distance—Thirty-eight times around a 7.8 mile course, or approximately 298.5 miles.

Conditions—The race shall be run under the racing rules of the American Automobile Association; it shall be a class E, non-stock event, open to class C cars of 301 to 600 cubic inches piston displacement.

Entry Fee—One car, $500; two cars, $800; three cars, $1,000, of the same manufacture.

Prizes—To the winner, the William K. Vanderbilt, Jr., cup and an additional award of $3,000 in gold coin given by the M. A. D. A.; also a donor's trophy for permanent possession by the winner; to the winner of second place, $2,000 in gold coin by the M. A. D. A.; third, $1,000; fourth, $500.

PABST BLUE RIBBON TROPHY

Date—Friday, September 20, 1912, starting at 12 m.

Distance—Twenty-eight times around the 7.8 mile course, or approximately 220.6 miles.

Conditions—The race shall be run under the racing rules of the A. A. A.; it is open to class C, non-stock, division 3C, for cars of 231 to 300 cubic inches piston displacement.

Entry Fee—One car, $250; two cars, $400; three cars, $500, of the same manufacture.

Prizes—To the winner, the Pabst Blue Ribbon trophy, deeded by Colonel Gustave Pabst, of Milwaukee, for perpetual competition, plus a secret purse sealed in the cup; and an additional award of $1,000 in gold coin by the M. A .D. A.; to the winner of second place, $500 in cash; third, $250 in cash; fourth, $125 in cash. A special donor's trophy accompanies the award of the Pabst trophy.

WISCONSIN CHALLENGE TROPHY

Date—Friday, September 20, 1912, starting at 12 m.

Distance—Twenty-two times around the 7.8 mile circuit, or approximately 173.4 miles.

Conditions—The race shall be run under the racing rules of the A. A. A.; it shall be open to class C, non-stock, division 2C, for cars of 161 to 230 cubic inches piston displacement.

Entry Fee—One car, $250; two cars, $400; three cars, $500, of the same manufacture.

Prizes—To the winner, the possession of the Wisconsin Challenge trophy, a perpetual prize deeded by the Wisconsin Motor Mfg. Co. of Milwaukee, and a special donor's trophy for permanent possession; and an additional award of $1,000 in gold coin by the M. A. D. A.; to the winner of second place, $500 in cash; third, $250 in cash; fourth, $125 in cash.

GRANVILLE TURN AT NORTHEAST CORNER OF COURSE

on the north side, directly opposite. Bleachers will be erected at the big curve at the junction of Thirty-fifth street, Fond du Lac avenue and Burleigh street. Two smaller bleacher sections may be located in the middle of the two 3-mile straightaways.

Description of the Course

The Wauwatosa course is a quadrangle lying wholly within the township of Wauwatosa, Milwaukee county, Wisconsin. Four straightaways, each pair approximately paralleling each other, all of them as straight as an arrow, have been selected to form the cup course. While most of the road racing courses of America and Europe have either touched and passed through a town or city, the Milwaukee course is the first which actually touches, at any point, the city limits of a large metropolis, such as Milwaukee is with its 410,000 inhabitants. The advantages of such close connection with the source of the revenue-producing crowds is obvious. Citizens of Milwaukee will have but a stone's throw to go to reach the course, while the thousands who will come from other places throughout America and are quartered in the hotels and boarding houses of the city will not have to break their necks to catch trains at early hours to reach the scene of hostilities.

The start and finish line is located in the center of the Burleigh street straightaway which comprises the south leg of the course. The grandstands, judges' and press towers and administration buildings are thus placed mid-way between the two most important street car lines and roadways leading directly to the course, these being the Fond du Lac avenue car line, which approaches the course at its southeastern corner, and the Lisbon avenue line, running up to the southwestern corner. For convenience in reaching the course, this arrangement cannot be excelled.

The Burleigh straightaway is approximately 8,953 feet in length, and from the start and finish line the cup racers will head due east on Burleigh street for a distance of .6 mile, striking the city limits of Milwaukee at Sherman park, just beyond which they will turn into the North Fond du Lac road, which is a 14,270-foot straightaway. Instead of making the hairpin turn which the old established roadways would make obligatory, were Burleigh street followed to its junction with Thirty-fifth street and Fond du Lac avenue at the city limits, the Milwaukee promoters have followed the line of Thirty-sixth street in making an easy turn, cutting off a triangle measuring approximately 125 feet on all three sides. The two outside legs of the triangle are used for bleachers arranged in V-shape, one side following the line of Burleigh street and the other the line of Fond du Lac avenue.

The so-called City Limits turn is the best of the four corners of the course, the M. A. D. A. having intentionally reduced it to an easy round because of the short distance the cup racers will have to go from the start and finish line to get into North Fondy road. Assuming that the contesting cars will try to make as high a speed as they are capable of in going down Burleigh street past the grandstands, it was found advisable to form a suitable turn to permit of a continuation of the high speed .6 mile beyond the stands without any considerable risk to the drivers. On the City Limits turn, the road widens from the uniform width of 40 feet on the home stretch to 120 feet, which is continued at that width until the turn ends up in North Fondy road, which is 40 feet wide for a distance of approximately 500 feet, then being reduced to the uniform 30-foot width. The outside circumference of City Limits turn stands 4 feet higher than the inner circumference, the bank being comparatively slight in deference to the wishes of a majority of the drivers, who do not favor radical banking of turns for road racing.

Road Old Military Trail

The course runs due northwest from City Limits turn for a distance of approximately 3 miles along North Fond du Lac road, an old military trail which formed the principal exit from the settlement of Milwaukee 75 years ago. The road is one of the oldest and most solid highways in the vicinity of Milwaukee, the foundation of the road being 4 feet deep, beginning with dirt, gravel and then No. 2 crushed stone, upon which has been placed another 6 inches of No. 2 rock, with 2 inches of screenings mixed with a 70 per cent asphaltum oil composition as a surface. This method of surfacing has been followed throughout.

At Town Line crossing, the northeastern corner of the quadrangle, the course turns due west at an angle of 120 degrees into the Town Line road, a straightaway of

CURVE FROM BURLEIGH STREET INTO NORTH FOND DU LAC ROAD

GRANVILLE TURN, FACING DIRECTION IN WHICH CARS WILL COME

5,495 feet, which for half the distance from North Fondy road is a slight upgrade. The turn is flat, no banking having been done. Town Line road has been widened from 16 and 18 feet to a uniform width of 30 feet and has been made straight as the edge of a ruler. From the crest of the grade, half-way between the two long legs of the course, it follows a slight downgrade to the South Fond du Lac road, a companion to the North Fondy straightaway in every particular excepting variable grades.

Town Line Turn a Hairpin

The turn from Town Line into South Fondy is a hairpin, the inside of the round before it was touched being a bare 45 degrees. This was considerably increased by cutting away a triangle of 45 feet, but, with the improvement, it will form the most difficult curve of all to be negotiated. As Town Line road runs due west and South Fond du Lac road runs due southeast, the nature of the turn may easily be pictured in the mind.

To eliminate as much of the danger of this curve as possible, the M. A. D. A. has banked the round approximately 6 feet, measuring across the greatest width of the round from inner to outer circumference. In addition, the reconstructed macadam roadway has been given a layer of 4 inches of cement of somewhat coarser composition than the best grade used for the construction of sidewalks in the city of Milwaukee.

After this turn, known as Sommerville curve, the course follows a straight line for exactly 12,500 feet along the South Fond du Lac road, which has been given a uniform width of 30 feet. South Fondy road is of a rolling nature, and contains three rather short but slight rises or knolls, two of which are only 375 feet apart and located near the center of the straightaway stretch.

Five hundred feet before the course enters Graveyard curve to make the home stretch in Burleigh street, South Fondy road is widened to 40 feet. The curve, which goes around Wanderers' Rest cemetery, had a natural angle of 120 degrees, which has been retained excepting that the outside of the curve has been built up 2 to 3 feet. The greatest width of the roadway throughout the curve is 72 feet, somewhat wider than believed necessary because of the easy nature of the turn. It will be possible for the cup racers to swing into Burleigh street without perceptible slackening of speed developed on the South Fondy straightaway, pounding over the Burleigh street home stretch and across the start and finish line at a tremendous clip.

In comparison with the Savannah course, over which the grand prix has been run several times, and the Vanderbilt cup for the first time on Thanksgiving day of 1911, the Milwaukee course looks mighty good.

HAIRPIN TURN AT SOMERVILLE, WHICH IS BEING CONCRETED

It is only one-half as long, or 8 miles against 17. Instead of winding about in a tortuous circuit, as the Savannah course does, Milwaukee has a four-legged speedway that is almost a parallelogram, all sides of which are straight as arrows. The famous Waters road straightaway at Savannah offers nothing better than the North Fond du Lac road stretch at Milwaukee. Ferguson, LaRoche or Dale avenues, on the Georgian course, are no better stretches than Town Line, Burleigh or South Fondy roads in Milwaukee.

Every inch of the Milwaukee is high and dry, that is to say, no part of it has a semblance to swampiness, which means a firm, hard roadbed on a solid foundation that is not likely to crumble under excessive weight or high speed. The area included in the four legs of the course is between 350 and 400 feet above the level of Lake Michigan and approximately 650 feet above the sea level, taken as a standard in measurement by the United States geological survey.

Rich Farms Surround Course

The course is bounded by farms of unusual fertility, the soil in this territory having first seen the hoe and plow more than 80 years ago. The lands are owned by agriculturists classed well-to-do, evidence of which may be found in the well-kept farm buildings and the fine residences. That these farmers are progressive is proven by their alacrity in giving their rights to the public highways for a monster speed carnival and giving the promoter thereof, the M. A. D. A., the customary rights to the use of their acres and frontages for the various purposes of a road race.

In reconstructing the roads used for the Vanderbilt course, the Milwaukee Automobile Dealers' Association called upon the Wisconsin state highway commission for the services of its engineering staff and experts. One reason was that the as-

United Motors in Hands of Receivers

Involuntary Bankruptcy Proceedings Started in New York Against Big Holding Corcern—Suit Is of Friendly Nature—Liabilities Placed at $12 250,000 and Assets at $15,300,000—W. E. Strong and Robert S. Walker in Charge of Affairs

NEW YORK, Sept. 12—Special telegram—Involuntary bankruptcy proceedings of a friendly character were entered against the United States Motor Co. late tonight in the United States district court before Judge Charles M. Hough, of the southern district of New York. The petitioning creditor is The Brown & Sharpe Mfg. Co. The parties to the suit are the United States Motor Co., Alden-Sampson Mfg. Co., Brush Runabout Co., Columbia Motor Car Co., Dayton Motor Car Co. and the Maxwell-Briscoe Motor Car Co.

Judge Hough forthwith named W. E. Strong, of the Central Trust Co., and Robert S. Walker, formerly head of the Rock Island system, as receivers under bond of $150,000. The bond was originally placed at $75,000, but owing to the fact that ancillary proceedings will be instituted immediately in Indiana, Ohio, Michigan, New Jersey, Connecticut, Rhode Island and Massachusetts, the amount of the tentative bond was doubled.

Liabilities and Assets

The liabilities of the company are estimated at $12,250,000, and the assets, consisting of cash, bills receivable and securities of subsidiary and other corporations, are valued at $15,300,000. The assets are largely embraced by the factory plants of the subsidiary companies, which are scheduled at $6,250,000, against which there is a secured indebtedness of $200,000. The quick assets as of July 31 amounted to $9,250,000. Factory inventories, which represent an item of $4,000,000, are included in the foregoing item, as also is the amount of $2,500,000, which represents all the cash on hand and bills receivable.

The liabilities of the company consist of $6,000,000 of debenture bonds, while the remainder, amounting to $6,250,000, consists largely of the merchandise and banking claims against the company.

Ever since the early days of last spring it has been apparent that some sort of reorganization would have to intervene in the affairs of the embarrassed company, which was seriously crippled by slowness in deliveries owing to the backward season. The regular dividdend was passed in February, and the securities of the company fell sharply in the marts of trade. This led to a withdrawal of credit and together with the bad weather, finally forced the company to ask for an extension of time on its obligations.

On June 15 such an extension was granted to carry the company past the end of the selling season, it being deemed advisable to allow the 1912 stock to be marketed by the company itself rather than through a receivership.

This was done and W. E. Strong, who has just been named as one of the receivers of the ocmpany, took charge of its financial affairs and was elected chairman of the board of directors. Both the banking and merchandise creditors formed committees to conserve their interests and from the two committees an advisory board was formed.

It had been apparent from the first that a large amount of money would have to be raised in order to put the companies on a businesslike footing, and when it was found impossible for the creditors to reach an agreement that would make possible the new financing, the only thing left was a receivership.

Appeal to the courts, according to practically everybody interested in the matter, does not mean that the end of the company is at hand. On the contrary they say that under the receivership much aggravating delay and expense can be saved by having the federal court take jurisdiction. It is also pointed out that when the time comes for reorganization some plan to assess the stock or wipe it out can be accomplished with more dispatch than such an end could be accomplished without a receivership.

The date to which the extension goes is Friday, and the sudden determination to file proceedings was taken in order to forestall extraneous legal proceedings in the state courts and elsewhere.

The whole trouble with the company is lack of ready money. Several of the subsidiaries are in excellent shape individually, particularly the Maxwell-Briscoe Co., in which plant the book value of the stock is 100 per cent of its value, but owing to the combination of circumstances the funds that must be devoted to caring for current needs, back debts and for financing the 1913 manufacturing campaign, are short of the required amount.

In the bill of complaint it is stated that the receivables so owned by the subsidiary companies are in many instances not immediately capable of collection in any way, and that the motor company is liable upon the entire indebtedness.

That through the indiscriminate issue to banks and others of promissory notes now outstanding as aforesaid, intricate and involved questions exist as to the equities and rights of the defendant companies as between one another, which can be adjudicated only through one suit in equity wherein all such questions can be determined.

Conditions Are Outlined

In another section of the bill the following condition is outlined: While the motor company and the subsidiary companies have a large amount of supplies and materials on hand and there are in the hands of the selling companies for sale completed motor cars to the value of about $2,000,000, on July 31 the conditions of the motor industry were such that said finished product could not be sold in time to provide for the payment of the matured and maturing obligations of the said companies and neither the Motor company nor the subsidiary companies have now adequate or sufficient funds and are unable either by realizing upon their quick assets, even at a great sacrifice or by securing further loans, or otherwise, to meet their current obligations which have already matured and will mature in the near future, and in view of the present financial condition of said company it will be impossible for any of them in the near future to raise by loans or otherwise suffiicent funds to enable them to prosecute their business.

[Continued from page 9.]

sociation rebuilt public highways and received permission for so doing in consideration of the fact that after the races the roads would in reality be improved public roads, as defined by the highway commission. Another reason was that car dealers are not road builders, although they are among the greatest enthusiasts for improved highways from the very nature of their business.

W. C. Hughes, the engineer who surveyed the course, has made the following report to the Milwaukee Automobile Dealers' Association:

This is to certify that I have measured the proposed course for the Vanderbilt cup and grand prix races, covering North Fond du Lac Road, Thirty-sixth street and Town Line road, South Fond du Lac road and Burleigh street, said measurements being taken in the center of each road around the circuit. I find the stretches of each road to measure as follows: North Fond du Lac road, 14,270 feet; Thirty-sixth street, 400 feet; Town Line, 5,495 feet; South Fond du Lac road, 12,500 feet; Burleigh street, 8,953 feet; total distance, 41,618 feet, or 7.882 miles.

ELMORE PLANT CLOSED DOWN

Clyde, O., Sept. 7—The plant of the Elmore Mfg. Co., Clyde, O., was closed down last Tuesday, laying off 200 men. It is stated that the plant will be dismantled and the machinery moved elsewhere, but officials of the company are most reticient as to what their future plans will be. No reason for closing down the plant is given

Stone Road from Coast to Coast Planned

Carl Fisher and J. A. Allison Make Practical Proposition to Construct Transcontinental Highway—Motor Car Makers Asked to Contribute Percentage of Gross Receipts to Purchase Crushed Rock for Such a Purpose—Indianapolis Willing

NEW YORK, Sept. 9—One of the biggest plans for building a stone road from New York to San Francisco was made known in Indianapolis and Detroit today when it was announced that a movement has been started with the motor car and accessory makers in these cities to raise over $10,000,000 from the motor industry throughout the country to purchase crushed rock for such a roadway, the purchasing and delivering of the rock being a part played by the motor industry. The building of the road will be left to the county and state authorities, with whom contracts will be made to complete the work within a certain time and according to certain instructions before the materials are turned over to them.

The plan to raise the $10,000,000 from the motor industry is one of the most practical and rational yet suggested in the good roads field. This sum has to be raised by January 1, 1913, a little over 3 months. The plan is to collect from every motor car maker, from every accessory maker, from every car dealer and from owners. With the manufacturers and dealers the plan is to collect a third of 1 per cent each year for 3 years, this amount to be taken from the gross receipts of the company, which will provide a fund much in advance of $10,000,000. Cash or notes will not be collected but donation slips issued, which slips will be turned over to a bond company to hold until the permanent organization which will care for the purchasing and delivering of the material is organized.

Fisher Originates Plan

The plan originated over 1 year ago in the fertile mind of Carl G. Fisher, of Indianapolis speedway fame, and who during the last 12 months has been accumulating data on the cost of road construction, cost of road materials, cost of cement bridges, cost of cement mile posts, etc. During that time he has talked with many manufacturers to find out if they would co-operate in such a scheme. This work started with the Indianapolis car and accessory manufacturers, all of whom agreed with the scheme and at a meeting held today the movement was launched on its practical course by every one of the makers agreeing on the plan outlined.

In order that every subscriber to the fund will be protected no construction of any nature will be started until the entire subscription has been guaranteed, and if, for any reason, the plan should fail, all moneys will be returned to those having made payment with interest at 3 per cent. By having the required amount guaranteed by 1913 it will be possible to complete the work by 1915 so that the road may be used by motorists attending the Panama Pacific exhibition, which opens in San Francisco in the spring of 1915.

Instead of getting all of the financial assistance from the manufacturers and dealers, the plan includes the co-operation of all car owners in the country. This is possible by three classes of membership, one a $5 class another a $100 class and a third of a $1,000 class. Radiator emblems of different types will be issued to each member according to his class, and special wall or window medals issued to all dealers who contribute a total of 1 per cent of their gross receipts to the fund in 3 years.

No Particular Route in Mind

The plans do not call for any particular highway route across the states. At present there are two or more transcontinental highways and the matter of deciding whether either of these or a different one is to be selected will be left to a commission of motoring interests. All moneys collected or subscribed for the road will be used in the actual purchase of material, which is purchased on a price which covers delivery at the railroad siding where needed. Prices for material range from 90 cents to $2 per cubic yard, depending on the distance the material has to be hauled. A conception of the amount of rock required for such a highway can be gained from the fact that a roadway 9 feet wide and with rock 12 inches deep cost $1,750 a mile for material. This proposes a short haul. Although by route it is 3,300 miles from ocean to ocean, little more than 2,200 miles of transcontinental highway would call for stone construction, as there are approximately 900 miles of improved streets in cities, town and villages on this course. This fact alone considerably reduces the problem of building such a highway. The fund of $10,000,000 will give approximately $5,000 a mile for road material, and since road material represents from only 30 to 50 per cent of the cost of building a road, it means that instead of a $10,000,000 road across the country, there will in reality be a $25,000,000 one.

The actual building of the road will be under the state and county authorities, to whom the materials will be turned over. The states and counties will sign contracts to build the roads under government inspection. Mr. Fischer has discovered that some of the best roads in northern Indiana and northern Ohio have cost but $1,750 a mile for material. It is natural that building a stone road in Iowa the material will cost more because of the long haulage. This will amount to not more than $800 a mile for any part of the country.

Many additional plans are being furthered in connection with this transcontinental scheme, one of which is the erection of sign posts, one for each donation of $1,000 secured on the plans outlined. Each post would carry a bronze plate containing the name of the donor. Such posts will cost $12 each.

Still another plan is that of entering into arrangements with the telephone companies whose lines are on the selected highway to secure plugging facilities on the line so that the motorist having a breakdown between cities can immediately get into telephone communication with his dealers, a repairman or garageman. Such a system as this is at present in operation in England and also in certain sections of southern California.

The possibilities of travel on a transcontinental highway of this nature are unlimited. Supposing 25,000 cars were to make a return trip over such a highway, occupying 40 days. If each car carried 4 people, the daily cost would be $25, or $800 for the round trip. At this same rate there would be an expenditure of $20,000,000 for the 25,000 cars. While this is a broad calculation so far as the number of cars is concerned, it will, however, serve to show the value to the towns and cities passed through of such a highway. Real estate values would increase all along the route.

Indianapolis Contributes

Indianapolis, Ind., Sept. 11—At a dinner given the business interests of this city at the German house last night, Carl G. Fisher and James A. Allison announced a project for building a rock highway from New York to San Francisco, to be completed April 1, 1915, in time for the Panama-Pacific Exposition.

Approximately $300,000 was pledged for the project at the dinner. The Henderson Motor Car Co. and the Prest-O-Lite Co. pledged $50,000 each. The following subscribed one-third of 1 per cent of the gross receipts for 3 years: Prest-O-Lite Co., Wheeler & Schebler, Ideal Motor Car Co., Premier Motor Mfg. Co., Waverley Co., Gibson Automobile Co., American Motors Co., Marion Motor Car Co., Pumpelly Battery Co., Empire Tire Co., Henderson Motor Car Co., C. Off & Co., Gates Mfg. Co., Gus Habich, motor cycle dealer, and G. H. Westing Co., motor cycle dealer.

Fisher goes to Detroit tomorrow to interest the motor car interests in the project.

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Service Reform Needed

YOU shear off differential studs today and crack the bevel gear. A few minutes later by long-distance telephone you get your order for new parts into the Detroit factory less than 300 miles away through your local dealer. After waiting a day, perhaps 2 days, you wire the factory asking where the repair parts are. Back comes a telegram saying the order had not reached the factory. The same day you discover the local agent had the parts in stock, but this was not discovered until 3 days after the break. A few hours later the local dealer completes the repair. Scarcely is it done when the factory repair parts arrive, useless because too late. For the next week there are back-and-forth letters, the factory wanting to charge for the parts, although announcing by wire that an order for them never had been received, and the car owner declaring that he will only pay for one set, as the repair order was placed through the local dealer. Correspondence back and forth continues for 1 month before the matter is finally adjusted, by which time the owner is so discouraged with the situation that he vows to purchase any make of car except this particular one.

THE circumstance outlined above actually occurred, but it was worse in that scarcely was one controversy among owner, dealer and manufacturer closed before another breach was opened. The owner was permanently ostracised. His disgust reached its zenith. As might be expected his car was soon traded in on one of a different make.

A BIG mercantile house in St. Louis broke a truck sprocket. Inside of 20 minutes a wire was sent to the factory 500 miles away, the truck being disabled and out of commission. No word coming from the factory on the following day, and no parts being received, a second message was telegraphed. After waiting, not 1, or 2, but 3 days the part arrived, but for a different model. The owner was as far back as when the break occurred. It was necessary to start all over again. There was another wait of 3 days, and the same wrong part arrived. An investigation showed that the proper part had been asked for, the mistakes were in the service department. A third trial brought once more the wrong part and finally the owner sent his own driver to the factory to get the part.

ONLY one result can follow such service. The owner was immediately in the market for other makes of trucks. He soon made other purchases, his old truck was traded in, a new make got established with the owner. Poor service lost out. This actually happened.

CONTRAST with this the cases of another truck maker, who had made an improvement in his truck, an improved type of clutch was fitted, a radiator of greater capacity added. From the factory a letter went forth announcing that on any convenient Saturday afternoon three factory repair men would call at the owner's garage and from noon Saturday until Monday morning the new clutch would be fitted, the new radiator added, the truck given a road test and made ready for the opening of the week. The convenient Saturday afternoon arrived, so did the repairmen, and so did the repair parts. The work was done, the truck tested, and was ready for Monday morning. There was not 1 cent of charge for the work.

WHAT was the result? A more than satisfied customer. More trucks were needed and repeat orders were placed. Service of this nature is the greatest seller, it gets orders when all other methods fail. It is the quintessence of salesmanship, it is the acme of good advertising.

NOT only are improvements being made today in the branch houses and in the dealers' houses, but also in the home office at the factory. Until a year or so ago many factories had hopelessly inadequate service executives. These departments were in the control of graduated mechanics who while familiar with making repairs were lacking in executive ability—the one essential in a service department. Today one company after another is announcing the engagement of new executive heads for service departments, and letters are mailed broadcast to dealers and owners heralding the news. The awakening is saving the day in not a few sections, and makers instead of placing this service in the expense account should enter it as a regular business investment and a good one at that.

No Stopping Progress

WE are living in a constructive age. Daily evidence is being given of the eventual mastery of every constructive influence. At no period in history has the world moved backward for one single instant, but in spite of all shortsighted hindrances, riding over all obstacles in its way, every new discovery or invention leading to better things has overcome all objections and has taken a place in life.

HOWE invented the sewing machine and his house was wrecked and his machine destroyed by an angry crowd, which imagined in its ignorance that the sewing machine, in the language of the labor agitator, would "take the bread out of their mouths." The sewing machine was adopted, however, in spite of all opposition, and as a result a hundred times more seamstresses, tailors and the like are employed than ever before, getting more money for less work, while everyone is better dressed in consequence.

WHEN the railway was first proposed between London and Manchester the opposition was most bitter. Water travel was much safer, for a speed of 20 miles per hour would take one's breath away. If railways were generally adopted the gases from the stacks of the engines would kill all the birds and the cattle in the fields. Drivers of stage coaches opposed the new transportation, bitterly trying to hold it back, but the railway gained, until today one man out of every six in the United States is in some way connected with railway transportation. Labor has not suffered; but, on the contrary, the laboring man in England can now take his week-end at the seashore, while his grandfather, in all his life perhaps, never stirred ten miles out of his native village.

WHEN motor buses were first put on the streets of London a few years ago the cab drivers objected. A bus was blocked in every way possible by the horse vehicles, and all done that could be done to hinder their adoption; but buses came. There are now no horse buses in use in London by any but private owners. The motor delivery vehicle when adopted instead of putting men out of work will demand more men and of a better standard of living, meaning higher wages and better hours.

Reliability Run Around Lake Michigan

Chicago Motor Club Undertakes Promotion of Sensational Contest

CHICAGO, Sept. 9—The Chicago Motor Club has undertaken the promotion of the most sensational reliability ever carded in this country—a trip around Lake Michigan, a journey which has been made only by a few cars and which is expected to produce interesting results. Part of the way is through almost virgin territory and especially in the wilds of Michigan and the northern part of Wisconsin the going will be far from easy.

This is to be the club's annual contest and is to be run under grade 3 rules, which penalize for time and work and which do not call for a technical examination. Because of the wild country, it is thought that the run will be as destructive of perfect scores as if the technical experts were put on the job. As a publicity proposition, it is thought to be the best announced for several years.

It is planned to start the contest October 21 instead of October 7, a time when there is nothing else on the motor calendar. The run will go through Wisconsin first, with the principal cities probably Milwaukee, Fond du Lac, Oshkosh, Neenah, Appleton, Green Bay, Marinettte, Menominee, Escanba, to St. Ignace, where the cars will be put on a ferry and shipped across the straits, about 8 miles, to Mackinaw City, where the route will run through Michigan, taking in Petoskey, Charlevoix, Traverse City, Cadillac, Grand Rapids, Kalamazoo and thence into Chicago by way of South Bend. This will be a 1,000 miles run and doubtless will last 6 days.

The pathfinding car, a Cutting, will be sent out this week R. S. Clark who will follow the Blue Book data as laid out by J. P. Dods. J. G. De Long will head the expedition.

The motor truck demonstration of the local organization which was to have taken place this week has been postponed because of lack of entries.

BUFFALO'S RELIABILITY ON

Buffalo, N. Y., Sept. 11—This morning at 5:30 o'clock sharp the third annual 800-mile reliability tour of the Automobile Club of Buffalo started from the official parking station at Main and Edward streets. The contesting cars included a McFarlan six, Hupmobile, Krit, R. C. H., Warren-Detroit, Paige-Detroit, two Maxwells and an Amplex. The contest will be known as a class E, grade 3 reliability tour in which contested cars will be classified according to selling price, thus making a field of seven divisions. To the winner will be awarded the Laurens Enos trophy and the Vars trophy, donated by President Vars of the Buffalo Automobile Club, and special trophies will be awarded to winners in each division in which two or more starters participate. The run is sanctioned by the contest board of the American Automobile Association.

The first day's run will be from Buffalo to Olean by way of Gardenville, Blossom, Elma, Elma Center, East Aurora, South Wales, Holland, Protection, Chaffee, Yorkshire, Corners, Delavan, Lime Lake, Machias, Franklinville, Cadiz, Ischua and Hinsdale; thence to noon control at Smithport, Pa., by way of Weston, Portville, Duffy, Eldred, Larabee, Corryville, and Farmers Valley. The return trip to Buffalo will be by way of Ormsby, Newton, Mount Alton, Lafayette Corners, Lewis Run, Custer City, Bradford, Limestone, Carrollton, Killbuc, Salamanca, Elkdale, Ellicottville, Ashford, West Valley, East Concord, Glenwood, West Falls, Duels Corners, and Reserve.

Coming Motor Events

September 8-26—San Sebastian rally.
September 11-14—Third annual reliability run of the Automobile Club of Buffalo, Buffalo N. Y.
September 14-21—Annual fall show; Chicago Automobile Trade Association.
September 17—Grand Prix; Milwaukee, Wis.
*September 20—Wisconsin challenge and Pabst Trophy races; Milwaukee, Wis.
*September 21—Vanderbilt road race; Milwaukee, Wis.
September 17-20—Fire engineers' convention; International Association Fire Engineers, Denver, Colo.
September 25-October 6—Agricultural Exhibition and Plowing Matches, Bourges.
September 30-October 5—American Road Congress; Atlantic City.
September—Track meet; Universal Exposition Co., St. Louis, Mo.
October 4-5—Track meet; Sioux City Auto Club, Sioux City, Iowa.
October 5—Fifth annual run of St. Louis Automobile Club; St. Louis, Mo.
October 6—Gallion hill climb.
*October 7—National tour Detroit to New Orleans; American Automobile Association.
October 8—National convention of Electric Vehicle Association of America; Boston Mass.
October 12—Track meet; Rockingham park, Salem, N. H.
October 21—Chicago Motor Club reliability.
October 24-25—Santa Trophy Team match, Chicago Motor Club.
October 26—Los Angeles to Phoenix Road Race.
November 2-3—Splash guard competition; Versailles.
November 6—Track meet; Shreveport Automobile Club, Shreveport, La.

*Sanctioned by A. A. A.

SHOWS.

September 23-Oct. 3—Rubber show, Grand Central palace, New York.
September 28-Oct. 6—Exposition agricultural motor cars, Bourges, France.
October 2-12—Fire show, Madison Square Garden, New York.
October 7-12—St. Louis show.
November 8-16—Olympic show; overflow November 22-30 Agricultural Hall.
December 7-22—Paris salon.
January 6-11, 1913—Cleveland show.
January 4-11—Montreal show.
January 11-18—New York pleasure car show; Automobile Board of Trade; Madison Square Garden and Grand Central Palace.
January 11-22—Brussels, Belgium, show, Centenary Palace.
January 20-25—New York truck show; Automobile Board of Trade; Grand Central Palace and Madison Square Garden.
January 20-25—Philadelphia show.
January 25-February 1—Montreal, Canada, show.
January 27-February 1—Detroit show.
February 1-8—Chicago show.
February 10-15—Chicago Truck show.
February 10-15—Minneapolis show.
February 17-22—Kansas City show.
February 24-March 1—Show at Omaha, Neb.
March 3-8—Pittsburgh show.
March 8-15—Boston pleasure car show.
March 17-22—Buffalo show.
March 19-29—Boston truck show.
March 24-29—Indianapolis show.

MAKING LONG CANADIAN TRIP

Toronto, Ont., Sept. 9—J. W. Wilby, English motorist, and F. V. Haney, are making a transcontinental trip from Halifax, N. S., to Vancouver, B. C., and on Saturday reached Toronto after making a daily average of 18 miles, having started the tour at Halifax, on August 28. So far no accident of any kind has marred the trip. In discussing the trip, Mr. Wilby states he finds the roads in the province of Ontario to be far superior to those in other provinces. Mr. Wilby believes a Canadian national highway from coast to coast will be constructed in a few years and as, in his opinion, the scenery in Canada is better than in the United States, he believes many American tourists eventually would make the Canadian transcontinental motor trip. The motorists leave this morning for Winnipeg, Man., which they expect to make in 10 days. Owing to there being no roads in the northern part of Ontario the car will have to be shipped for some distance. This is believed to be the first time that a car has made the Halifax-Toronto trip.

PARIS TO TRY ELECTRICS

Paris, Sept. 1—Electric motor vehicles, which never have been very popular in France, are about to be experimented with by the Paris General Omnibus Co., having a monopoly of the bus service in the French capital. The first bus to be put under observation will be of French origin. Later it is intended to experiment with an electric bus fitted with the new Edison batteries. The European company responsible for these batteries claims that a determined effort will shortly be made to get into the French taxicab business with electrically propelled vehicles. The Paris General Omnibus Co. runs about 800 gasoline vehicles and a small number of horse-drawn buses. By the terms of its contract, however, the horse buses must all be abolished at the end of the present year, and the number of gasoline buses in the city at that date will be practically 1,000. Up to the present no serious attempt has been made to introduce electric motor buses into Paris.

Peugeot Once More Makes Clean Sweep

Zuccarelli Wins 183-Inch Class in Le Mans Road Race, While Goux Captures Big-Car Division at 72.76 Miles Per Hour—Boillot Shows 101.53 Miles Per Hour in Flying Kilometer Trial at Boulogne—Ford Wins Dunlop Trophy in Canada

BOILLOT IN PEUGEOT IN BOULOGNE HILL-CLIMB

PARIS, Sept. 9—Special cablegram—The Peugeot again has demonstrated that its grand prix victory was no fluke by winning both divisions of the road racing carnival at Le Mans today, conducted by the Automobile Club of the Sarthe. In the 183-inch class Zuccarelli, driving a Lion Peugeot, was an easy winner, covering the 402.4 miles in 6 hours 12 minutes 25 seconds, an average of 64.8 miles per hour.

In the Sarthe cup event for heavy cars the grand prix Peugeot, driven by Goux, won over the same distance, which was covered in 5 hours 31 minutes 54 seconds, an average of 72.76 miles per hour.

There were fourteen starters in the small-car race won by Zuccarelli. Thomas, his team mate, set the pace, but was unable to maintain it long. Duray, in an Alcyon, then took up the running, only to be slowed by lubrication trouble. At half distance Zuccarelli went ahead, hard pushed by Barriaux, Duray and Champoiseau in a Schneider. The finish was:

Lion Peugeot, Zuccarelli	6:12:25
Schneider, Champoiseau	6:30:36
Vinot, Molon, Jr.	7:16:13
Schneider, Nicodemi	7:17:36
Schneider, Croquet	7:33:00
Cote, Devore	7:41:35
Hispano-Suiza, Riviere	7:50:00
Alcyon, Duray	No time

Goux's victory in the big car race was an easy one, the only other finisher being Leduc in an S. P. A. Goux's time was 5:31:54 and Leduc's 6:55:15.

Nicodemi was held up in the traffic going to the course and started 15 minutes late. Still he landed in fourth place. Guyot was stopped at the starting line by clutch trouble. Later, after taking on gas, his car caught fire and burned. Barriaux's Alcyon was put out of the race by a broken steering gear.

BOILLOT WINS AT BOULOGNE

Paris, Aug. 30—Seven kilometers over give and take roads at an average of 101.53 miles an hour; 3 kilometers with a standing start at 86.9 miles an hour; the flying kilometer at 77.66 miles an hour; the standing kilometer at 64.6 miles an hour; the mile standing hill-climb at 58.44 miles an hour; and 300 meters standing start on a 14 per cent gradient at 44 miles an hour—such was the star performance of Georges Boillot in the 4.3 by 7.8 Peugeot with which he won the grand prix race.

The records were put up in connection with the annual 4-day meeting at Boulogne-sur-Mer, when Boillot was the fastest in all the events in which he competed. Undoubtedly the best performance was the 7-kilometer race at the average of 101.53 miles an hour. This was run over a moderately surfaced road comprizing a kilometer length with a gradient of 8 per cent. The previous record over this distance was held by the 200-horsepower Darracq, having a cylinder area double that of the Peugeot, and averaging 85 miles an hour. In this run Boillot easily defeated his fastest kilometer on a perfectly straight and level road in the grand prix at Pieppe. On that occasion his time was 99.86 miles an hour. Bruce-Brown's speed over the same measured kilometer was 101.67 miles an hour.

It should be noted that under the Boulogne rules the cars had to take part in all the races, from the 14 per cent hill-climb to the flying kilometer, without a change of gear ratio. So far as Boillot was concerned there was no attempt to increase speed by the adoption of streamline body, the only change from his Dieppe racing equipment being the absence of mud guards. The car was fitted with Rudge-Whitworth wire wheels shod with Continental tires.

In the 3-kilometer event, standing start, the grand prix Peugeot was alone in its class. The second best time was made by a Crespelle having a single-cylinder de Dion-Bouton motor of 4 by 7.8 inches bore and stroke, which was timed in 1.15⅗, being at the rate of 60.2 miles an hour. Riviere in a four-cylinder Hispano-Suiza of 2.5 by 7.8 inches bore and stroke, put up 2:06⅗; Ramet's Gregoire occupied 2:10⅕, and the one-cylinder Cohendet 3:16⅘. In the touring car class Joerns' Opel was the fastest with 1:38⅘, being at the rate of 67.8 miles an hour. Derny, in a 3.1 by 7-inch Hispano-Suiza, was clocked in 1:57⅕, the other winners in their respective classes being: Leduc, S. P. A., 2:10⅘; Rigal, 3-liter Sunbeam, 2:25⅗; Jean Crouy, 3.1 by 5.1 Hispano-Suiza, 2:34⅕; Morel, Motobloc, 3:56⅗; Manfait, Delage, 4:19⅗; and Violet, single-cylinder Violette, 4:08.

For the 7 kilometers flying start the nearest approach to Boillot's record performance of 101.53 miles an hour, was a run by Guyot in 4:17⅗, being equal to 60.7 miles an hour. The car was a 3-liter model weighing, fully equipped, 1,700 pounds, which had been built by Guyot and Picker to the order of a leading French factory, but which was not completed in time to take part in the grand prix; this was its first appearance in public. Ramel, in a Gregoire, put up 4:55⅗, and Antony, on Cohendet, 7:13. Among the tourists, Joerns was again the fastest, with 3:24⅘ for the 7 kilometers, this equalling 76.5 miles an hour. He was followed by Derny in the two-seater standard Hispano-Suiza in 4:08⅗, the other class winners being Leduc, S. P. A., 4:40⅘; Rigal, Sunbeam, 5:18; Jean Crouy, Hispano-Suiza, 6:19⅗; Lavie, S. P. A., 6:22⅕; Morel, Motobloc, 9:38⅘; Manfait, Delage, 9:23⅗; Violet, Violette, 10:09⅗.

The mile hill-climb at Bainethum, with an average gradient of 10 per cent, was romped up by Boillot, from a standing start, at 58.44 miles an hour; Guyot came second in the racing section with an av-

erage of 36.3 miles an hour, his time being faster than that of the cars in the higher class. Crespelle's one-lunger went up in 1:39⅘ and Ramel's Gregoire in 2:15⅘.

As the result of the various races, Derny, Hispano-Suiza, won the Franchomme cup with 257 points, being followed by Joerns, Opel, with 177 points; the same driver also won the Caraman-Chimay cup, with Joerns as his second; Joerns won the Imperial Pavillion cup outright; and Rigal, Sunbeam, won the Crespel cup with 73 points, followed by Jean Crouy, Hispano-Suiza, with 59 points, and Jouglet, Hispano-Suiza, with 41 points.

The meeting closed with a 500-meters race having standing start and finish, when Joerns and Rigal showed the greatest amount of skill. The time at the finish was not taken until the car was standing on the line. In most cases it was necessary to use the reverse gear in order to come to a stop on the line, but a few adopted the plan of applying all brakes and swinging round facing the direction of the starting line.

The results of the elegance competition gave first place to a closed Panhard with a Driguet body, and second to a Rolls-Royce with Hooper body. The most elegant open car was considered to be a Renault with body by Letourneur & Marchand, of Paris. Rigal's Sunbeam was the most elegant of the cars having taken part in the races.

FORD WINS DUNLOP TROPHY

Winnipeg, Sept. 3—The ninth annual race meet of the Winnipeg Automobile Club was the most successful speed tourney ever carried out in western Canada. Barney Oldfield and the other two members of his team, Heinemann and Fritsch, proved a great attraction in addition to the usual club events on the big program which totalled eleven events in all.

The track record for 1 mile, previously held by W. C. Power and the Buick, was reduced by Oldfield in the Christie to :54. Oldfield also set a new track record of 1:50 for the 2 miles.

The chief event of the day for local drivers was the 25-mile race for the Dunlop trophy, and was again won by Billy Rogers in a Ford car in 25:32.

The big crowd of 10,000 people, the largest ever in attendance at a race meet in Canada, evinced the greatest enthusiasm over all events, and Rogers came in for a wonderful reception at the end of the Dunlop trophy race.

Rogers also won the mile against time in 60 seconds flat, for the Gas Power Age trophy, the Goodrich trophy, and the club purse of $100. The meeting was under the auspices of the Winnipeg Automobile Club, and was managed by A. C. Emmett.

CONTEST FOR ST. LOUIS OWNERS

St. Louis, Mo., Sept. 9—The fifth annual owner's reliability tour of the Automobile Club of St. Louis will take place on Saturday, October 5, with more than forty cars competing. The route selected is through one of the most picturesque parts of the state and at one time touched the foothills of the Ozark mountains. A part of it is over the St. Louis-Arcadia highway. From St. Louis the cars will go through Maxville, Antonia, Victoria and Hillsboro to De Soto over the Lemay Ferry Road. Leaving De Soto they will return to St. Louis over the Ware and Gravois Roads through Morse's Mill, Valley Park and Manchester. What is going to give the 1912 tour an added zest is the number of women drivers that will compete. Last year there was one woman driver in the tour. This year there will be no fewer than five. The tour is open to any amateur driver in the city.

COTTON OUTLOOK IN TEXAS

Austin, Tex., Sept. 9—It is now possible to make what may be considered a conservative and reliable estimate of the probable total cotton production of Texas for the present season. According to the views of men who have made a careful personal investigation of the condition of the crop in every part of the state and who have had many years experience in forming conclusions as to the yield, the total production this year will be in excess of last year's record by not fewer than 200,000 bales, and if the splendid prospects that now obtain in north Texas continue until the close of the fruiting period the excess of the state's yield this year over last may reach 500,000 bales, or a total production of approximately 4,900,000 bales.

Already enough cotton has been marketed in Texas to have a very noticeable effect upon other lines of industry. This is due to the fact that the farmers are rapidly putting their money in circulation. In many instances they are making investments in manufacturing and other industrial enterprises in their home towns. This is shown by the increased number of companies that are being organized for this purpose all over the state.

Car dealers also report that in the section where the cotton crop is being marketed in large quantities their trade is already showing a big increase. The time has arrived when the average Texas farmer looks upon the ownership of a motor car as being a necessity rather than a luxury. As a result of the practical uses to which this modern vehicle is placed dealers in motor cars find the farmers their best patrons. One of the features of the trade that is just opening up on a large scale is that the farmers are buying a higher standard of cars than in former years.

All lines of trade are expected to be exceedingly prosperous in Texas this fall and a spirit of optimism prevails in every section. In towns and cities building operations have been going on all summer with unprecedented activity and plans for other improvements during the next few months have been prepared on an elaborate scale. The most serious problem met with not only on the farms but in the cities is the shortage of labor. There is little prospect of this situation improving in the near future.

DISBROW AT FOND DU LAC

Fond du Lac, Wis., Sept. 10—Louis Disbrow and his aggregation gave an exhibition here yesterday, the occasion being the first day of the annual county fair. Disbrow, Joe Nikrent and Bill Endicott, who comprise the Disbrow Racing Association, hit the ½-mile circular dirt track in good fashion, considering the condition of the circuit. The events were:

Mile against time—Disbrow in Jay-Eye-See, 1:01:50.

Three miles against time—Disbrow in Simplex Zip, 3:15:00.

Three miles—Disbrow in Case White Streak defeated Joe Nikrent in Case Bullet in 3:19.

Australian pursuit race—Disbrow in Simplex Zip defeated Nikrent in Case Bullet and Endicott in Case White Streak.

One-mile handicap—Bill Endicott in Case Eagle defeated Disbrow in Case White Streak and Nikrent in Case Bullet

RIVIERE IN HISPANO—SUIZA IN BOULOGNE TRIALS

New York Electric Dealers Get Together

Association Is Formed for Purpose of Stimulating Trade in This Branch of the Industry—Proposition Made to Establish Motor Mart for Representatives in Manhattan

NEW YORK, Sept. 9—New York dealers in electric vehicles have reached the conclusion that the time for active local extension of the business is at hand. With this idea in view they have just completed the organization of the New York Electric Vehicle Association, which was established last Thursday. The purpose of the association is to foster and stimulate the electric vehicle trade in New York and vicinity. It will provide the usual protection for its members, and afford the opportunity for conference and co-operation of the interests represented in its roster for the purpose of improving the trade conditions in the metropolis. It is the definite intention of the new organization to secure a building which will house many, if not all of the local representatives. Announcement has been made that such a building has been found, the owners of which have agreed to lease on a basis of 5 per cent rental.

This building is several stories high, centrally located, and, according to the intentions of the association, will be divided into departments, such as a co-operative garage, show room, salesroom, and individual offices. While nothing in this line has been definitely settled, it is understood that options on this property have been taken by the association, and, unless better facilities are offered, the proposed deal will be consummated.

Indications have never been so favorable for the realization of the long-cherished dream of a motor mart. A much larger volume of trade is expected for the coming year, in view of the fact that the electric vehicle business has increased 45 per cent up to July 1, 1911, from the corresponding period of the year previous.

There are at present 1,800 electric vehicles in service in New York city, of which number but 400 are pleasure cars, the balance of 1,400 being commercial machines. This is surprising to most people, but the fact is that New York has never been considered a promising field for the sale of electric pleasure cars, there being but ten out of a score makers represented in the metropolis, while of the makers of electric commercial wagons, thirteen are represented out of a possible eighteen makers of this type of car. It is expected that the effect of the new organization will be to systematize the sales of both types and that it will prove a trade stimulus.

It is expected that considerable time will be required to round up all of the dealers in the Motor Mart, on account of present leases and the inevitable opposition of some members.

The following officers were named at the first meeting, whose duties will be to launch the new association upon its career: Arthur Williams, president, and William P. Kennedy, vice-president; the selection of the secretary and treasurer being deferred until some later time, when it is expected that a paid official will be selected for these joint duties, by the president or an executive committee. The executive committee consists of Nathaniel Platt, C. Y. Kenworthy, S. W. Menefee, and V. A. Villar.

FRICTION-DRIVE MAKERS IN COURT

Detroit, Mich., Sept. 9—The Buckeye Mfg. Co., Anderson, Ind., maker of the Lambert car, have instituted suit here in the United States district court against the Cartercar Co., of Pontiac, Mich., alleging infringement of its patent relating to the use of aluminum face plates in the friction drive. A counter suit has been filed by the Cartercar Co. through its attorney, R. A. Parker of the firm of Parker & Burton, patent attorneys of this city. The Cartercar suit claims that the Buckeye company is making use of the former's method of friction wheel engagement and operation, which also is patented.

It is doubtful if the cases will come up before the present term of the district court owing to the large number of cases on the docket. They will probably be heard during the next term of the court which commences November 1.

LONAS IN KNIGHT COMPANY

Chicago, Sept. 9—Announcement is made that F. E. Lonas, attorney for Knight & Kilbourne for years associated with the inventor of the Knight motor, has invested largely in the company which has been formed to build Knight-motored cars at Turin, Italy. Associated with him is H. S. Levassor, of the firm of Panhard-Levassor, of France. The car will be called the Italo-Knight and the designer is W. O. Thomas, consulting engineer of the Knight interests. Two four-cylinder chassis will be made one of 20 horsepower with a bore of 90 millimeters and a stroke of 138. The other will be 25 horsepower, 100 by 150 millimeters. Other features of the new Italo-Knight, it is announced, will be a block motor, worm-driven rear axle, wire wheels, chain-driven gearbox, electric lighting and electric self-starter.

WILL HEAR CASE LATER

Buffalo, N. Y., Sept. 9—The date for the return of the temporary injunction issued several weeks ago by Judge John R. Hazel in United States district court here directing the International Automobile League of Buffalo to show cause in the action brought against it by the Ford Motor Car Co., of Detroit, has been extended to October 1 through agreement of the respective attorneys in the case. The order was to have been returned on last Thursday.

The Ford company wants a permanent injunction against the International Automobile League to restrain that concern from selling or advertising for sale Ford cars at less than the price fixed by the manufacturers of the Ford cars. The Ford Motor Co. in its complaint alleges that the International Automobile League advertised that any person paying $10 would be admitted to membership and would have the privilege of purchasing Ford cars at less than market price. The Ford company declares many orders for Ford cars were taken and that an attempt was made to buy the cars from the makers but the sale was refused. It is claimed that the Buffalo league secretly bought the cars from some Ford dealers and sold them to members of their organization at a 10 per cent discount.

CHANGE IN FIAT SALES SYSTEM

New York, Sept. 7—Announcement is made of the incorporation of the Fiat Motor Sales Co. to succeed the Fiat Automobile Co. at Broadway and Fifty-seventh street, New York, in the distribution of Fiat cars. The officers of the new company are: President, E. R. Hollander of New York; vice-president, Henry M. Sage of Albany; treasurer, Charles L. A. Whitney of Albany; secretary, R. D. Willard of New York.

In the formation of the new company J. S. Josephs and Benjamin Eichberg, who have for years been connected with the sale of Fiat cars in New York, retire to devote their entire time to the development of the Fiat factory at Poughkeepsie. Their action is in line with the plans of the parent factory at Turin, Italy, to greatly increase the output of its American branch. The new company will control the New York, Albany, Boston, Providence and New England territory.

MERGER CONTEMPLATED

Louisville, Ky., Sept. 7—At a meeting of the stockholders of the American Corporation of New Albany, Ind., which recently took over the plant of the American Automobile Mfg. Co., a proposition to merge with the Advance Power Co., of Chicago, was considered this week. The board of directors was authorized to do what it thinks best. It is understood that the merger will be consummated within the next month and the capital stock will be increased from $150,000 to $1,000,000.

The new concern will be known as the Advance Motor Car Co. It is planned to move the Chicago concern to New Albany where a 1,000 pound truck, with a double friction drive to sell for a low price will be manufactured. A salesroom will be maintained at Chicago. It is understood that C. D. Harris, of Chicago, president of the Advance Power Co., will hold the same position in the new concern.

At the meeting J. W. Baxter, of New Albany, Ind., was elected director in the American Automobile Co. to succeed L. A. Boli, Jr., retired.

HUPP INCREASES CAPITAL STOCK

Detroit, Mich., Sept. 9—The capital stock of the Hupp Motor Car Co. has been increased from $500,000 to $750,000, according to the papers which have recently been filed with the secretary of state. This capital increase is made possible through the transferral of $250,000 from the company's surplus to its capital account. This disposition of its surplus was voted at a recent meeting of the stockholders of the Hupp company, at which it was also voted to allow a 50 per cent stock dividend on account of the capital increase. The Hupp company reports prosperous conditions.

TO MAKE CANADIAN ARGYLL

Montreal, Can., Sept. 7—The Hackett Motor Car Co., Ltd., of Oshawa, Can., has secured the patent rights to manufacture the Argyll engine in Canada. The Argyll car hitherto has been made in Scotland, but Canadian capitalists have purchased the manufacturing rights for the dominion. This concern will be known as the Hackett Motor Co. Last spring it bought the plant of the Matthew Guy Automobile Works, Oshawa, and the equipment there will be enlarged to enable the company to turn out a very largely increased output. It is the intention of the Hackett company to build cars equipped with the Argyll valveless engine. It is announced there will be four and six-cylinder models. The company will also build a cheaper car with a different engine. The Hackett concern will take the form of a limited liability company. The capital is $350,000.

DETROIT ELECTRIC MEN MEET

Detroit, Mich., Sept. 9—The Anderson Electric Car Co. entertained its agents last week. Representatives were present from all parts of the country where the Detroit electric is sold. Plans for the coming season's campaign were talked over, and contracts for the 1913 allotments were made.

DAY WITH GENERAL MOTORS

Detroit, Mich., Sept. 9—William L. Day, formerly sales manager of the Mitchell-Lewis Motor Co., Racine, Wis., has been made vice-president and general manager of the General Motors Truck Co., Pontiac, Mich.

Huber Patent Threatens to Make Trouble

Three-Point Suspension Claims Being Pushed by Inventor Who Declares He Will Test Their Validity in Courts —Packard, Havers and Cass Take Out Licenses

DETROIT, Mich., Sept. 7—The Emil Huber patent No. 788,407, dated April 25, 1905, which covers all forms of three-point suspension of the main frame of a motor car, bids fair to make trouble for some twenty concerns, according to E. A. Parker of the firm of Parker & Burton of this city, patent attorneys for the North American Vehicle Co., owner of the Huber patent.

Within the last 2 weeks the patent has assumed large proportions and it is the intention of the owners to test its validity to the limit. Already several concerns have taken out licenses, among which are the Packard Motor Car Co., the Havers Motor Car Co. and the Cass Motor Car Co. The North American Vehicle Co., through Mr. Parker, has sued the Detroit Taxicab and Transfer Co., which concern owns a number of Kelly machines. The Kelly Motor Truck Co. of Springfield, O., is conducting the case for the taxicab concern through its attorneys, Staley & Bowman of Springfield, O. It is merely a test case and suit has been brought against Detroit Taxicab and Transfer Co. simply because this concern is the most convenient to reach. The North American Vehicle Co. claims that the Detroit Taxicab Co. is operating trucks designed along the lines of the Huber patent and in violation of this patent. Should the former win the case it will affect the motor car industry to a considerable extent.

The case is now on the docket of the United States district court, but it is doubtful if it will come up for consideration during the present term.

Staley & Bowman, attorneys for the taxicab company, on September 3 filed an answer to the North American Vehicle Co., refuting the latter's claim. The substance of this answer is given below:

1—Defendant denies that Emil Huber, mentioned in said bill of complaint, was the true, original, first and sole inventor of any new and useful improvements relating to the motor vehicle as alleged, also denies that the alleged improvements were not known or used in the United States before Huber's alleged invention and not operated or described in any printed publication in the United States or any foreign country before Huber's alleged invention or more than 2 years prior to Huber's application for patent and that same had not been in public use or on sale in this country for more than 2 years prior to Huber's application for patent or that any application for a foreign patent for alleged invention was filed by Huber or his representative prior to the filing of the application in the United States or that said invention had not been abandoned.

2—Defendant admits that letters patent of the United States No. 788,407 dated April 25, 1905, was issued to Emil Huber, but denies that Huber made application to the commissioner of patents of the United States and renewed said application in accordance with the then-existing acts of congress or complied in all respects with the conditions and requirements of said acts or that letters patent were signed, sealed and executed in due form of law or that there was secured to Emil Huber the sole and exclusive right of making and selling others the improvements alleged to be described and claimed in said letters patent.

3—Defendant is not advised except by bill of complaint as to whether or not Emil Huber conveyed one-third interest in said letters patent to Henry G. Ide or as to whether or not Emil Huber and Henry G. Ide sold, assigned and transferred unto the complainant the entire right and interest in and to said letters patent, together with all rights of recovery for past infringements arising under said letters patent and therefore denies the same and leaves the complainant to test proof.

4—Defendant further denies that the complainant became and now is the sole and exclusive owner of said letters patent and of the alleged invention and improvements described therein or of any rights and privileges intended to be secured thereby and denies complainant has invested and expended much, or any sums of money or has been to great or any trouble or expense in and about alleged invention or that said invention has been and is of great or any benefit or advantage or that complainant will realize and receive any gains and profits if the alleged infringement be prevented.

5—Defendant denies any knowledge of the patent or alleged assignment to the complainant or of any alleged rights of the complainant and denies that it or the public has been fully notified of any alleged rights of the complainant to the alleged invention.

6—Defendant denies that it has contrived to injure or deprive complainant of any alleged benefits and advantages that might accrue and denies that it ever made, constructed, used or vended to others to be used, motor vehicles embodying and containing alleged invention within the United States or that it is continuing to do so, or has made and realized large profits and advantages from any such alleged infringement or that it is threatening to make use and vend to others to be used, motor vehicles, and further denies that any such alleged infringement has been to the great and irreparable or any loss or injury to the complainant or that the complainant has been and still is being deprived of great gains and profits by such alleged infringements or that it has made any preparation to continue such alleged infringement or any other alleged unlawful acts in disregard and defiance of any rights of complainant or that any act of this defendant has encouraged or induced others to venture to infringe said letters patent.

7—Defendant also denies receiving notice from complainant of any such alleged infringement or has disregarded any such notice or has refused to desist from any alleged infringement.

8—Defendant also denies that the devices described in said letters patent contain any material beneficial advance in the art over and above what was previously well known by those skilled in the art as it existed at and prior to the date of the alleged invention purported to be described and claimed in said letters patent.

9—Further answering this defendant is informed and believes and therefore avers the fact to be that said letters patent No. 788,407 are invalid for the reason that said Emil Huber was not the original and first inventor of the invention alleged to be described and claimed in said letters patent or of any material and parts of the said alleged invention had been patented or described or illustrated in printed publications prior to the date of the alleged invention by Emil Huber or for more than 2 years prior to the date of his said application for patent.

10—Defendant further states on information and belief that in view of the said art with respect to the motor vehicles and analogous apparatus at the time of the alleged invention of the said Emil Huber and long before that time the matter shown and claimed in said letters patent were not patentable inventions but improvements or mere mechanical expedients requiring no invention and within the domain of mere judgment and skill in the art.

11—Defendant further states on information and belief that the alleged improvements described in letters patent were wholly inoperative and worthless for any useful purpose.

12—This defendant denies each and every allegation in said bill of complaint contained except hereinbefore admitted or specifically denied and avoided.

Canadians Are Interested in Car Display

Toronto Exhibition Attracts a Half-Million Dollars Worth of Pleasure and Commercial Motor Vehicles—Nebraska State Fair Benefits Nebraska Dealers

VIEW OF MOTOR CAR EXHIBITION HELD IN TORONTO

TORONTO, Ont., Sept. 7—What is claimed to be the greatest display of motor cars ever made in the dominion of Canada is the exhibition in the Transportation building here at the Canadian national exhibition where more than fifty car dealers are exhibiting at least a half million dollars' worth of pleasure and commercial motor cars, including trucks and motor fire wagons. The application for space far exceeded accommodations and it was necessary to press into service a tent, 100 by 50 feet, to the west of the Transportation building to care for the overflow exhibitors.

At the exhibition many new cars never before seen in Canada were on display, some of these being of Canadian design while others were of English, French and American make. Unusually active business was done at the exhibition in the matter of sales, hundreds of thousands of visitors to the Toronto fair having viewed the cars among whom were many buyers.

The mammoth exhibition indicates the great business that the Canadian factories and dealers have had during the past year over 15,000 licenses being granted to owners of cars alone in the province of Ontario. The greatest demand for motor cars came from the vicinity of Toronto as this city is the center of great population and the roads in this section for motorists are excellent. However the great surprise in the motor car line this past year was Hamilton, Ont., which factories have had great difficulty in keeping up with the constant demand for cars.

Nineteen factories are finding it a hard matter to keep up with the demand for cars. The factories are all located right here in the province of Ontario and are as follows: Peck Electrical Co., Toronto; McLaughlin-Buick Motor Car Co., Oshawa; Tate Electric Co., Walkersville; Flanders Electric Co., Walkerville; E-M-F Co., Walkerville; Ford Motor Co., Walkerville; Hupp Motor Car Co., Walkerville; Canada Cycle and Motor Co., West Toronto; Reo Motor Car Co., St. Catharines; Petrolea Motor Car Co., Petrolea; Northern Motor Car Co., Kingston; New Dominion Motors Co., Brantford; Canadian Motors Co., Galt; Gramm Motor Truck Co., Walkerville; Brockville Atlas Auto Co., Brockville; Clinton Motor Car Co., Clinton; Woodstock Motor Car Co., Woodstock; Schacht Motor Car Co., Hamilton; and the Hackett Motor Car Co., Oshawa, Ont.

FAIR HELPS NEBRASKA DEALERS

Lincoln, Neb., Sept. 9—The state fair which closed here last week brought together the greatest collection of motor cars ever assembled in the state of Nebraska. The big day of the fair, there were nearly 2,000 cars, by actual count, parked in a place near the grounds, set apart for this purpose. They filled several acres.

It was an indication of the way that the farmers of Nebraska are buying cars. The biggest per cent of these cars were owned by farmers, or residents of small towns.

Wednesday was Omaha day, and this was the biggest day. Ninety cars, with their Ak-Sar-Ben banners went from Omaha to Lincoln on that day, and there were perhaps a still larger number of Lincoln cars, but the majority of the cars were owned by people living outside of the two large cities of the state.

One building was set apart for the display of cars, and about a dozen dealers had exhibits of the 1913 models. Omaha dealers went to Lincoln to assist the Lincoln dealers in the display of the cars. As many of the dealers from over the state visited the fair, a large number of contracts were signed up.

PREPARING FOR MICHIGAN FAIR

Detroit, Mich., Sept. 9—The Michigan state fair, which is to be held here from September 16 to 21, has much in store for motor enthusiasts this year. On the main floor of the motor car building, there will be the forty-five exhibitors of motor cars. This array of the season's latest models will occupy the entire floor space, while the second floor is to be devoted entirely to famous cars and to early models. The oldest Packard, the world-touring Hupmobile, the Regal Plugger, the Maxwell Glidden tour winner of last year, and many other well-known cars will be on exhibit. Several famous racing cars will also be shown. Many of the trophies which have been contested for in the past will be placed on exhibit, and the whole is unique, representing as it does much of the history of the motor car industry.

DETROIT S. A. E. MEETS

Detroit, Sept. 6—The Detroit section of the Society of Automobile Engineers held its monthly meeting last night at which two papers were presented, one by Mr. Parkinson of the Esterline company, on Golden Glow lamps, the other by Mr. Millington, western representative of the E. D. Budd Mfg. Co., on pressed steel bodies, in addition to the ordinary routine business.

Mr. Parkinson stated that this new lamp, although of value would not create a new era in the lamp industry, nor would it put any lamp companies out of business. There has been a big demand for an artificial light that would contain an element of sunlight and that would appear almost as a natural light.

The Glow Worm lamp gives this much desired result by using a reflection of special design and composition. The material used is a plate glass, the formula of which is a secret possessed by the glass company which makes the reflectors. The composition is such that the reflected light has the same spectrum as sunlight.

The design of the reflection is in general a parabola. This may be varied to suit a number of conditions. The thickness of the reflection is practically the same all over. The surfaces are highly polished and the back is silvered. The peculiar property of light given out by a Golden Glow lamp is that of fog penetration. By actual experiment a Golden Glow light 16 candlepower can be seen 2,300 feet through a fog where a 2,000 candlepower arc light was invisible at 200 to 300 feet only.

Burman Cuts Mile Mark in Jumbo Benz

When used on motor cars, the usual glare of the headlights is not found. Holes and bumps appear in the natural state and even colors can be very distinctly seen. Mr. Parkinson stated that the Detroit United Railways has ordered Golden Glow lamps for all new cars and all replacements. These lamps are not now on the market to the motor car trade but will be by fall. The paper was then open for discussion by members of the society.

The second paper of the evening was read by Mr. Millington, who asserted that the buying public is becoming very discriminating and demands style, comfort and luxurious equipment and at the same time popular prices. These conditions force the motor car builder to look around for a body that has the desired qualities and at cost to him that will be allowable. The old style of heavy wood frame construction and wooden panels is practically obsolete, the panels are hard to obtain and the time allowed for finishing is too short to permit of turning out a job that will stand up. The wooden frame construction with metal panels is now fairly popular and certainly has many good points, but a new body era is awakening. The era of the all steel rivetless and jointless motor car body. This type of body is made with a great degree of accuracy. All parts are die made and jig assembled. Panels are made in one piece and gas welded together. The whole is then spot welded to the pressed steel frame. All doors are die made, jig assembled and are consequently absolutely interchangeable. They are even painted before being placed on the bodies.

The cost of an all steel body constructed along the above pattern is high unless made in very large quantities.

Dirt Track Record Reduced to 47.85 Seconds at Brighton Beach—Oldfield, Disbrow and Others Drive at Minneapolis Meet During Annual Fair Held at Hamline

NEW YORK, Sept. 9—Clipping a shade more than ¾ second from the mile circular dirt track record, the Jumbo Benz, rated at 300 horsepower and driven by Bob Burman at Brighton Beach Saturday, made a new mark for the speed brigade to shoot at. The new record was made in a special event staged for the purpose of showing the car under ideal speed conditions. The start was impressive, following an easy circuit of the track to the head of the stretch, where Burman turned loose his motor and whisked over the line at spectacular speed. He swerved to the rail at the stand and then cut across the track to the club-house turn, shaving the inner circle and going far out on the track at the back stretch. The straightaway is rather long and the Benz covered it at the rate of nearly 100 miles an hour, cutting in close at the stable-turn and turning into the stretch with a roar came down to the line at brilliant speed.

The timers announced the new record as 47.85 seconds. The former mark was 48.62 seconds, which was made by the Blitzen Benz with Burman driving, last year. The speed attained was at the rate of a little less than 75.24 miles an hour. The summary of the other events follows:

Five miles, under 300 inches, non-stock—Ainsley, Mercer, won; Burke, E-M-F, second Time, 5 :13.

Five miles, under 600 inches, non-stock—Burman, Cutting, won; Lewis, Stutz, second. Time, 4 :45.

Three miles, free-for-all, Remy brassard, first heat—Burman, Benz, won; Kyle, White, second; Hickman, Mercedes, third. Time, 2 :46.

Second heat—Kyle, White, won. Time, 2 :57. Other two cars collided.

Forty miles, under 600 inches, non-stock—Burman, Ohio, won; Lewis, Stutz, second Time, 42 :09.

Five miles handicap—Lewis, Stutz, won Time, 5 :04

This mile record is a historic mark and one for which several noted drivers have fought. Barney Oldfield held it for several years; then Ralph de Palma cut in and on a couple of occasions he was credited with the work. For the past year Burman has had the field to himself. The car he drove Saturday was a new Benz, which he has just secured.

HAMLIN TRACK MEET RESULTS

Minneapolis, Minn., Sept. 9—Huge crowds saw the annual Minnesota state fair races Saturday afternoon, on the Hamline track midway between the Twin Cities. The races were under direction of Dr. C. E. Dutton, state representative of the A. A. A., and were electrically timed by a Warner instrument. Rain late in the day shortened the program and prevented running off a dead heat in the first event between Oldfield in a Cino car and Ulbrecht in a White Streak. Wonderlich was barred owing to notice of disqualification by taking part in an unsanctioned meet. G. L. Moore drove the Marquette-Buick instead. Summary:

Five miles, class E non-stock, for cars of 300 cubic inches displacement and under—Barney Oldfield, Cino, and Ulbrecht, White Streak, dead heat for first; Disbrow, Case Bullet, third; Leo Broker, Mercer, fourth. Time, 5 :05.

Five miles, class C non-stock, division 4C, cars of 301 to 450 cubic inches displacement—Barney Oldfield, Prince Henry Benz, won; Bill Endicott, Case, second; Al Wilson, Jackson, third; G. L. Moore, Marquette-Buick, fourth. Time, 5 :17⅗.

Ten miles, class E, open to cars of 600 cubic inches displacement and under, best two out of three heats—First heat, Disbrow, Simplex Zip, won; Lou Heinemann, Cino, second; Nikrent, Case Bullet, third. Time, 10 :03⅗.

Second heat—Disbrow, Simplex, won; Nikrent, Case, second; Heinemann, Cino, third. Time, 10 :15.

One mile, for world's circular dirt track record, flying start—Oldfield, Christie, won; time, :51⅕; Disbrow, Simplex Zip, second, time, :52⅗; Disbrow, Jay-Eye-See, third, time, :54⅗.

Australian pursuit race—Barney Oldfield, Cino, won in 13 miles; Nikrent, Case Bullet, second. Time, 13 :07⅗.

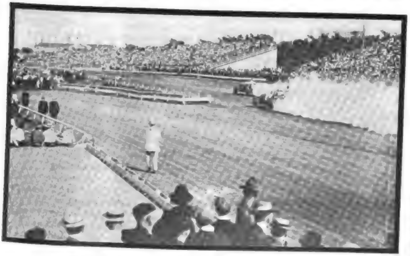
Special event—Barney Oldfield, Christie, against world's circular dirt track record, flying start. Time, :53⅗.

Special event—Disbrow driving Simplex Zip against world's 3, 4 and 5-mile circular dirt track records, flying start. Time, mile, :52; 2 miles, 1 :45⅗; 3 miles, 2 :37; 4 miles, 3 :28⅕; 5 miles, 4 :20⅗. Established new record for track. Old record was 4 :22⅕.

Five miles, class D, free-for-all handicap—Disbrow, Simplex, won. Time, 4 :47⅕; Nikrent, Case, second, 4 :48⅗; Broker, Mercer, third, 4 :53.

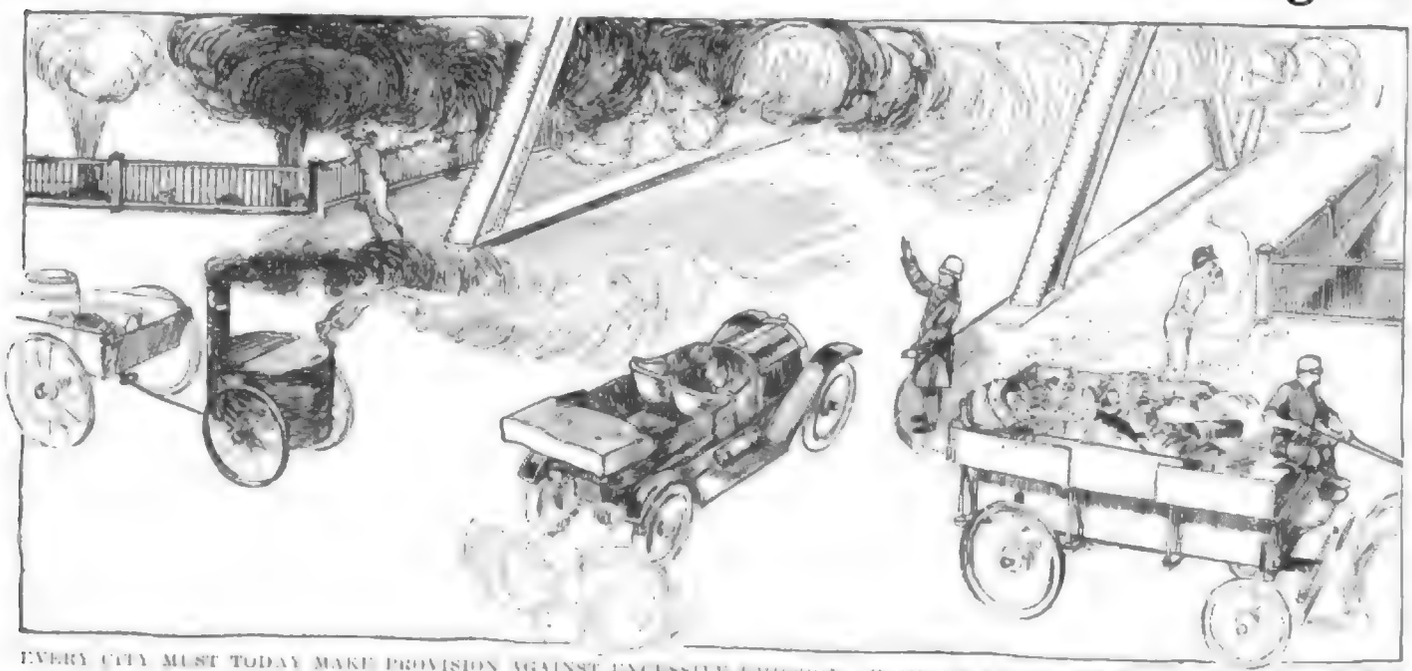
INDIANA FAIR SHOW A SUCCESS

Indianapolis, Ind., Sept. 9—The motor car show held in connection with the Indiana state fair in Indianapolis, September 2 to 6, proved quite successful, a satisfactory number of sales being reported. About 140,000 people visited the fair during the week. Companies exhibiting were: Marmon, Premier, National, Cole, International Harvester, Great Western, Hupmobile, Studebaker, Regal, Marion and American.



START OF FREE-FOR-ALL AT MINNEAPOLIS MEET

Modern Traffic Code Used in Washington



EVERY CITY MUST TODAY MAKE PROVISION AGAINST EXCESSIVE EMISSION OF SMOKE AND GASES FROM MOTOR VEHICLES IF NOT FROM DIFFERENT SOURCES

Many Noteworthy Features in District of Columbia's Rules

WASHINGTON, D. C., Sept. 7—In line with the commendable activity in behalf of uniform traffic regulations, Washington has much to offer for the emulation of other cities. On account of the unusual width of streets in the capital, the problem of properly handling this traffic with a necessarily limited police force is grave, and the effectiveness of the methods employed prove their value.

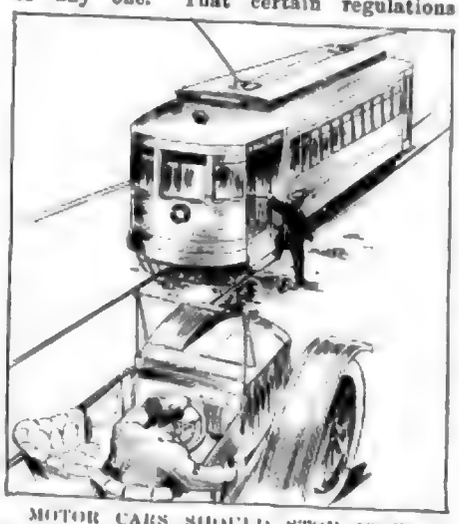
Among the features most noteworthy is the way in which the district regulates pedestrians, notably in the conduct of processions on the public streets. That this should have been brought to a high state of perfection in the city that has, without doubt, more functions of this character than any other, is not to be wondered at, and other cities which have been brought to the realization of the difficulties involved may well profit by the experience of Washington.

Great Advances Made

Following the lead of Captain Alexander R. Piper, U. S. A., retired, former police commissioner in charge of street traffic in New York city, to whom credit is due for the introduction of the block system of traffic regulation, great advances have been made in the conduct of traffic on the streets of American cities. In behalf of uniform regulations affecting the general conduct of traffic in all cities, too much cannot be said, but as Major Richard Sylvester, who is mainly responsible for the traffic system in Washington, points out, the arrangement of regulations for traffic in cities is an undertaking calling for knowledge and consideration of existing and continually arising conditions, and in one community there are conditions that do not belong to another, so that so far as setting forth suggestions for universal application to all phases of its problems, the many diversities and dissimilarities in the conditions to be coped with in different localities precludes in advance any practical draughting of universal regulations in all localities.

Problems in Other Cities

To what extent uniformity should be observed, according to Major Sylvester, may best be determined by reciprocal study of the problems of other cities by the authorities in charge of the traffic of any one. That certain regulations should be rigidly adhered to by all cities is strongly insisted by the major. To quote from an address delivered before the first American Road Congress, under direction of the Touring Club of America, which was held in Richmond, Va., last fall, to which Major Sylvester was a delegate, representing Washington, as its chief of police:



MOTOR CARS SHOULD STOP 10 FEET BEHIND A STREET CAR TAKING ON OR LETTING OFF PASSENGERS

"The degree of perfection in the construction of avenues, streets, roads and highways, as well as the degree of excellence in the providing of governing rules, usually corresponds to the degree of intelligence and wealth of the locality wherein the same exist and are controlled.

"The pedestrian is a prominent factor—in these regulations—whose rights must be protected. While the well established rule of the road, always to turn to the right, when one vehicle passes another, maintains generally, it is not so true in practice on the part of the pedestrian, though it should equally apply. It has been held by leading authorities that for the purpose of effecting a complete system of traffic, equestrians, led horses, and everything on wheels or runners, except street cars and baby carriages, should be regarded as vehicles, and the word horses should include all domestic animals.

Motormen Should Heed Law

"Street railway motormen should be required to conform to the orders of the constituted authorities at street crossings, dangerous corners and turns, at fire engine crossings and to all laws relating to speed, and taking on and letting off passengers.

"It should be required that drivers of all vehicles not only comply with the regulations, but that they should be urged

to co-operate with the police in instructing others in order to prevent congestion and accidents and to decrease financial loss through non-observance of the requirements.

"That heavily loaded, slow-moving vehicles should keep as close to the right-hand curb as possible is important, and a vehicle passing another going in the same direction, always should do so to the left.

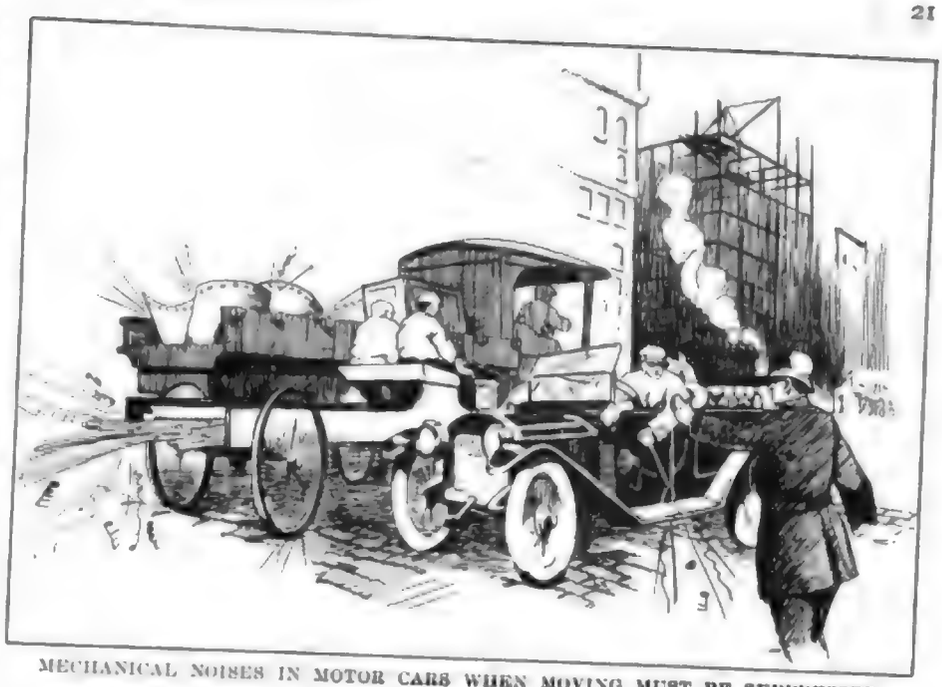
"The turning of corners to the right along the immediate line of curb has one drawback, at least, in this, that if a regulation prevails that all heavy vehicles shall keep as near the right-hand curb as practicable, in so doing it would immediately place the lighter vehicles in the same category as the heavy, and for this reason in the District of Columbia the regulation on this subject makes it obligatory in turning corners to the right to keep to the right center of the street. In turning corners to the left, into an intersecting street, the rule demands that a vehicle shall move so as to leave sufficient clear space between itself and the left-hand curb as to permit the safe passage of another vehicle.

Segregation of Trucks

"Avenues and streets given up to the retail trade, including the shopping districts, particularly, should be clear of large trucks hauling merchandise; wagons transporting hay, garbage and ashes, and other unsightly loads of refuse. These should be assigned to nearby thoroughfares more suitably adapted to commercial purposes.

"Every city having in view a favorable reputation in traffic regulation, must today make provision against excessive emission of smoke and gases from motor vehicles, if not from different sources, that would be offensive to pedestrians and others patronizing its public ways; and should be just as diligent in suppressing uncalled for noises from running engines after motor conveyances have stopped and other unnecessary mechanical noises when moving, as well as the rattling of milk cans at early hours of the morning by indifferent drivers of horse-drawn vehicles. Vehicles moving north and south should be accorded the right of way.

"There have been involved in the traffic regulations in large cities, beginning with New York, rules requiring that a driver shall signal when slowing up, stopping, turning or backing, by raising the whip or hand, or otherwise indicating the direction that is to be taken. While not generally enforced, the rules deserve an emphatic favorable endorsement.



MECHANICAL NOISES IN MOTOR CARS WHEN MOVING MUST BE SUPPRESSED

"One of the most far reaching regulations is that of the District of Columbia prescribing a penalty for colliding. While in Paris, the individual, under the law, must avoid being struck, in many cities of this country, vehicles are required to stop when the cars do in order to avoid colliding with passengers alighting therefrom. The District ordinance provides against driving a vehicle carelessly or wilfully so as to collide with another vehicle of any kind, or any person, and affords opportunity, when violated, for criminal and civil action.

Against Headlight Glare

"In cities all vehicles should be required to carry lights and all business conveyances should be numbered. The need for such regulation is at once obvious. Criticism also can justly be made in this connection against too bright or dazzling headlights on motor vehicles in congested districts, as well as the frequent failure to throw sufficient light upon the license numbers of motor cars, anywhere and everywhere. Equally necessary are the sound signals on motor conveyances, and they should be of a kind as near in accord as possible, and their use avoided for announcing that the machine is in waiting, or similar purposes.

Would Prohibit Street Repairs

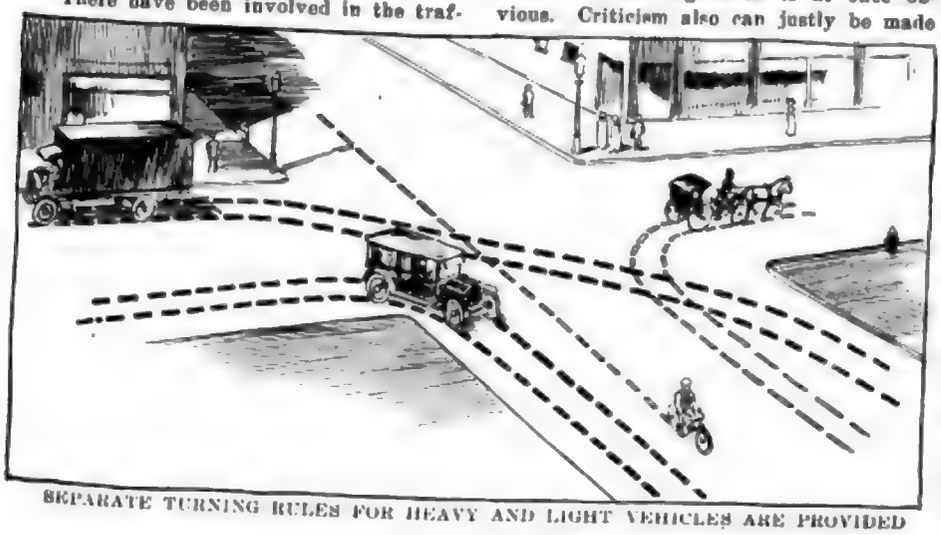
In a more radical vein, the major advocates the prohibiting of repairs in the public streets, the restraint of intoxicated drivers from driving in the public streets, requirements that a clear view to either right or left be provided in all covered vehicles, and the prohibiting sleds from the use of the public streets.

Recognizing the futility of antagonistic and factional action in regard to these matters, Major Sylvester says:

"Uniformity in movement by all classes of conveyances is what makes for traffic system. So long as one speed allowance is made for street cars, another for motor vehicles, and still another for horse-drawn vehicles, just so long will there be lack of system.

Should Recognize Horse's Demise

"It goes without saying that the authority charged with making the laws and regulations for the control of vehicular traffic should not lose sight of the fact that there is a gradual elimination of horse-drawn traffic in progress and a rapid increase of motor propelled vehicles, and this being accepted, conditions will so have changed in a period of time as to warrant modifications in restrictions and other respects. The withdrawal of the horse, gradual education of drivers and pedestrians, improvements in machines, skill in handling and demands for expedition in transit will necessitate it. Right here, it may be stated, however,



SEPARATE TURNING RULES FOR HEAVY AND LIGHT VEHICLES ARE PROVIDED

that no matter how near model the laws and regulations may be in a given locality, the same will not prevail unless that community has been fully enlightened on the subject, and has a police force sufficiently informed and courageous to enforce the same without fear or favor.

"Along these lines education should follow, and first, in order to reach those concerned, proper sign boards should direct as to the speed limit; where and when to slow down, keep to the right, or to the left as near as possible to the curb, in plain bold letters, along roadways and in sections where the display of warnings is important. In addition to this, there should be distributed to pedestrians and drivers in every city, as well as to all owners and operators of vehicles, through the police, with a surplus at station houses for those who might desire them, printed copies, in pamphlet form, of such laws and regulations as might be adopted. This independent of any similar action by motor clubs or others. In the matters of turns, and in crossing from one side of the street to the other, it is in keeping with good policy to illustrate the same in all printed instructions, with diagrams, showing the legal mode of procedure."

Washington Has Efficient Police

The method employed in Washington of enforcing these regulations is very well worth the consideration of all civic traffic officials. A corps of sixty policemen is detailed on bicycles to enforce the speed law, which corps is supplemented by a squad of six on motorcycles. The officers are instructed to be respectful and courteous, and to observe all vehicles, regardless of motive power with equally close attention, and to exercise discretion in making due allowance for slight unintentional violations, such as the unnoticed extinguishing of a tail light, whose previous burning might be indicated by its warmth, proving the lack of purposeful intent or negligence on the part of the driver.

As was mentioned above, the district has what is believed to be a unique regulation regarding the conduct of processions on its streets. At the suggestion of the police department, the city of Washington some years ago adopted a permanent roping device for guarding againt the encroachment of pedestrians upon the parade space. This consists of permanent sockets in the curb, at intervals of 50 feet, into which uprights are fitted, and cables run through eyelets in them, when in use. These temporary barriers extend from street intersection to street intersection, manila ropes being stretched across street crossings. This simple contrivance saves many hundreds of policemen, and is more effective, in that the steel cable cannot talk back, or abuse its authority.

In substance the policy of the capital city is to regulate its traffic as nearly as possible according to accepted standards, at the same time making due allowance for local conditions.

Manufacturers' Communications

CARBURETER TROUBLE DENIED

CHICAGO—Editor Motor Age—We wish to refer to Motor Age, issue of September 5, page 6. It is stated that de Palma, the winner of both the Elgin and free-for-all races, stopped on account of carbureter trouble. This is error, as de Palma had absolutely no carbureter trouble during the races, and never has had any trouble with the Rayfield since first installing it on his Mercedes car at Savannah last November. When de Palma stopped at the pits, his carbureter was flooding, but this was due to the fact that a valve had been shut off in his air line between the pump and the gauge, and the mechanic had pumped the pressure up to 8 pounds. In ordinary practice drivers never use more than 2 pounds pressure on gasoline, but the Rayfield carbureter will stand 7 pounds.—Findeisen & Kropf Mfg. Co.

Chicago—Editor Motor Age—Motor Age reported me as having carbureter trouble in the Elgin road races. Permit me to say I did not experience carbureter trouble of any kind at Elgin. I had no carbureter trouble at Indianapolis or Santa Monica and I have had none since first using the Rayfield last fall in the Vanderbilt and grand prix.—Ralph de Palma.

OVERLOADING TRUCK TIRES

Scranton, Pa.—Editor Motor Age—The question of overloading tires on motor trucks is one of the great points that the dealer as well as the tire man must look after. Sometime ago we received complaint from a large wholesale grocery company in Cincinnati, where we have some of our 6-ton trucks in service, that one of the rear axles was sprung. We knew that this could occur only through abnormal service. We therefore sent a representative to Cincinnati, not to go to the wholesale company, but instead to watch some of the loads coming from its place of business. When our representative thought he saw one overloaded, he boarded it. He persuaded the operator to drive on some public scale, and he found that there was on this 6-ton truck a paying load of 18,600 pounds, or 9¼ tons. It will be seen at once that this is a destructive overload.

In the case of the overloading above mentioned, three parties must suffer. First and greatest, the tire makers, and doubly so from the fact that the truck was not only grossly overloaded, but the rear axle had been sprung, throwing all of the load on the inside tires. The second party to suffer is the manufacturer, for, in the eyes of the public, the abuse as noted above is never considered, but the fact remains with them that the truck caused trouble in service; the manufacturer's reputation is therefore in jeopardy. The third party to suffer is the owner of the truck. While perhaps not suffering any immediate large outlay for upkeep, the continual overloading is bound to count against him.

To my mind we must look to the co-operation of the tire maker to prevent overloading, and, if taken in hand vigorously, a custom or usage can be established which will militate against overloading. The manufacturer's part in this program should be to provide the chassis with a capacity plate showing the capacity that the chassis should carry, including the body, and if the manufacturer makes the body also, he should provide a plate to be fitted to the body showing the capacity allowed in the body. He should caution the customer about the serious results of abnormal overloading, and should discourage overloading at all times. The part on the program that the tire maker should play can be even more effectual than that of the manufacturer. The tire maker has traveling about continually many salesmen who are soliciting tire specifications from prospective truck customers. Through them they could disseminate knowledge on the evil effects of overloading, and the salesman could play the part of inspector, if you choose to call it such, collecting evidences of overloading as in the case mentioned earlier in this article. If this tire representative will secure public weigher's sheets for overload, and the tire maker mail these sheets to the truck user, together with a diplomatic letter calling attention to the results of overloading, and in a polite way withdraw the guarantee from the tires they are using, it would have an immediate effect. The truck user does not want to lose the guarantee on his tires, and will immediately sit up and take notice, and the matter can then be amicably adjusted and tires reguaranteed for a reduced mileage, which would be a penalty for overloading. If the tire makers would get together, decide on a total load for different sizes of tires, have same cast in figures on their tires, and would then insist by means of frequent inspection that the tires be not overloaded, they would greatly assist in the elimination of this evil.

The industry is new, and a vigorous campaign against overloading carried on now, the truck manufacturer and the tire maker co-operating, will eliminate this evil. If not eliminated at once, it will grow to serious proportions, involving heavier construction and larger tires and a consequent increased cost of production, and will also lead to legislation probably prohibiting more than a certain weight being carried on a certain size tire, this to protect roads and bridges.—G. J. Loomis, General Sales Manager, Speedwell Motor Car Co.

The Motorists' Bookman

Practical Rubber Chemistry

ONE of a series of "Outlines of Industrial Chemistry," "The Chemistry of the Rubber Industry," by Harold E. Potts, M. Sc., combines the features of a complete and thorough text for study of the rubber industry, a general treatise of the rubber industry from the standpoint of pure chemistry, and a book for the use of the practical chemist, who desires the working knowledge of the chemistry of rubber, requisite to the pursuance of his calling, with a thorough ground work of analytical chemistry in its special phases as employed in the manufacture of rubber.

Accordingly, the author has entered deeply into the discussion of points considerably removed from the actual compounding and working of this substance, in order to equip the student with an intimate knowledge of its true chemical nature to aid him in intelligent comprehension of its physical possibilities; recognizing that the practical application of its physical properties and phenomena depend upon an intimate knowledge of its chemical constituency and faculties. In permitting his discourse to apparently wander from the practical, he has pursued a definite and plausible policy of broad discussion, and those who follow him in these discussions, derive thereby a clearer concept of the subject in its broadest entirety, than would be possible were the stricter form of diction adhered to by the author.

Following the author through his work, rubber is first treated in the abstract, its methods of production are briefly outlined, its identity as a colloidal substance is established, and a complete exposition of all of the characteristics of colloids to which class rubber belongs as distinguished from crystaloids is given. The analogy between these two classes of matter is broadly explained. The division of colloids into two solutions, sols and gels, their relative degrees of dispersion and microscopic division, their molecular movements, and the relative gravity of their constituents, is described and applied to their manifestations in crude latex. The chemical manifestation which reveals itself in the phenomena of coagulation is exhaustively treated, with its relation to colloidal emulsoids.

The production of raw rubber is next analysed, its extraction from the various plants, vines, shrubs, and trees, and coagulation of the extracted latex.

"The process of coagulation is one apparently depending on the removal of the protective film of protein or other protective colloid," says the author. "The globules rise through the liquid, coalesce, and yield a tough elastic mass of rubber, which may be regarded as an emulsoid gel. Coagulation is evidenly a colloidal problem. Yet the actual coagulation is a relatively simple matter till the quality of the resulting rubber gel is considered. Much depends upon the completeness, and therefore to some extent on the speed with which the liquid rubber in the globules changes to the tough elastic gel. Incomplete coagulation will tend to make the rubber tacky, while coagulation with an excess of acetic acid is liable to lead to a very close-meshed, and therefore brittle rubber. Further the color at all events seems intimately connected with the presence of degradation products of the proteins, probably of a phenolic nature. This again depends on the presence of ferments in the latex, which are capable of accelerating decomposition.

"Coagulation is effected—in the Amazon region—by smoking the latex over a wood fire in which the palm nuts, urikuri, are burning. A paddle is dipped in the latex and rotated in the smoke. After some time, more latex is poured on and the process is continued till a mass of rubber of considerable size is obtained. After removing the paddle by cutting the lump in half, the rubber loaf is ready for shipment."

Few realize that this process is chemically essential, the usual assumption being that it is merely a crude form of boiling down, but as is stated further:

"In this extraordinary process the coagulation is effected by the combined action of heat and smoke. The nuts in burning give off carbon dioxide, acetic acid, creosote and other substances. The rubber is deposited in successive thin films, each of which is thoroughly exposed to the action of the smoke, so that coagulation is complete. Further the sterilizing effect of the smoke on the ferments present tends to inhibit the decomposition of the protein. In spite of the apparently crude nature of the process, it yields rubber which is, on the whole, better than any other."

This process is, of course only one of many, being the one employed in the Amazon region, in the production of Para rubber. The different processes are classified as follows: Coagulation by heat, by creaming, by chemical agents, by heating and soaking, and by chemical treatment with subsequent extraction with solvents. Of the first process, the methods used are by smoking, boiling, evaporation, trickling, and separation on the human body. In the second process, the methods are, creaming after dilution with water, filtering, washing, and pressing; mechanical creaming, combined with acid coagulation. The third process is accomplished with both mineral and organic chemicals of various nature. The last two methods are purely local, the fourth being peculiar to the Congo, and the last to Mexico.

"It has been shown that the quality of the rubber produced from a given latex varies greatly according to the method of coagulation employed. The source of latex is far less important than the method of coagulation."

The defects of crude rubber are carefully enumerated, analyzed, and accounted for, including tackiness, retention of acid coagulating elements in dirty rubber, and lack of uniformity in plantation rubbers. Treating of the further processes in the preparation of rubber for manufacture, washing, drying, crepeing, etc., requisite to the production of technically pure rubber, regarding which, the observation is made:

"The dried rubber is weighed, and the loss on washing is expressed as a percentage on the crude raw rubber. This loss, in the case of Para, usually amounts to about 16 per cent. The low-grade crude rubbers lose very much more: thus Assare scrap may lose as much as 50 per cent. The loss consists of moisture, dirt, and certain constituents of the latex, such as sugars, etc. A recent development is the sale of semi-washed rubbers which have been partially washed, so that the loss on washing may be guaranteed to a certain extent."

Technically pure rubber having been made thoroughly familiar to the reader, the work continues with its chemical phase, with the following conclusion:

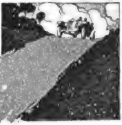
"Strong sulphuric acid has a very destructive action. Concentrated nitric also destroys the rubber with extreme rapidity, yielding yellow products containing aromatic acids. On treatment with alkalies they become brown, a reaction which is similar to the well known xanthoprotein reaction of proteins. Alkalies render rubber sticky. Ammonia tends to emulsify it. By the action of nitrous fumes, various nitrous products have been obtained."

This chapter is appended by an analysis that is very complete, and serves to condense the whole matter into a definite composed idea.

In a similar manner the subjects of manufacture, or "the art of compounding," vulcanization, reclaiming, rubber substitutes, and analysis and estimation of manufactured rubber are treated.

More than 120 authors have been consulted and quoted in the book, and very complete reference guides are appended. Much space has been devoted to the discussion of practical formulae, and outlines of analysis. Constable & Co., London.

Routes and Touring Information



Ocean-to-Ocean Trip

HARDSHIPS and difficulties do not always beset the path of the transcontinentalist, according to R. C. Bridge and Louis A. Cortier who recently traversed the western half of the continent in a 40-horsepower Stoddard-Dayton. Between the thrill of climbing mountain roads at night or driving over rocky arroyas, they took time to enjoy trout and bass fishing in the numerous streams and lakes which they passed. Traveling leisurely, they timed their trip to cross the Mohave desert at night and in the mountainous regions they left the trail to do their own scouting for deep pools where speckled beauties await the fly. Nor was this their only diversion. Mr. Cortier's log of his trip begins at Grand Rapids, Mich., but he picked up the ocean-to-ocean trail at Chicago, where preparations for the western half were made. The outfit consisted of a silkene tent, axe, shovel, blankets, cooking utensils, five suit cases, trunk, two extra casings, five extra rims, inner tubes, 5-gallon desert water bag and hunting and fishing outfits.

"Our load was a heavy one," said Mr. Cortier, "but we came through without breaking a spring. Our first day's runs after leaving Chicago was 234 miles to Bloomington, Ill. via Peoria and in that distance we encountered some very bad roads owing to the heavy rains the day before leaving Chicago. We spent 3 days in Bloomington during which time it rained constantly and the roads were very muddy from Bloomington to Burlington, Iowa.

"We crossed the Mississippi on a small ferry boat and were landed on the Iowa side in a very low marshy place and an ordinary car would have had to have assistance to get to the road but we got through without being towed.

"We reached Des Moines, Ia., at 10 o'clock the morning of June 5 and just escaped a heavy rain. We stopped in Des Moines 2 days awaiting favorable weather, leaving the morning of June 7 and reached Omaha the same evening where we again laid up 2 days on account of rain. We were very unfortunate about getting caught in the rains as we only got 70 miles west of Omaha where we were forced to wait 2 days more on account of muddy roads and it was real gumbo, too.

"Part of the time our car was buried to the axles and with the greatest difficulty we escaped being towed. We made only 70 miles June 12, and went into camp near Clocks, a small station on the Union Pacific where we spent another 2 days and drove to North Platte on a very muddy road. The road conditions were very bad nearly all the way across Nebraska owing to the fact that they were repairing the roads and on account of the long rains June 15, we passed two cars stuck in the mud and turned out and went around them after offering to pull them out. We camped that night at a small town called Lodgepole 120 miles east of Cheyenne and had some excellent bass fishing.

"We made Cheyenne the next night and spent 2 days resting after our siege of mud. We experienced our first tire trouble 40 miles west of Cheyenne on June 19, where we blew out a rear casing on Shennon pass, at an elevation of 8,000 feet. We discovered a very good trout stream about 5 miles west of this place and spent 2 days angling for mountain trout and were very well repaid as we got some nice strings of the speckled beauties.

"We broke camp June 21, and drove to Medicine Bow. After leaving Medicine Bow we found some very bad roads. There were dozens of washouts and sand in places was very deep, causing us to use our lower gears for miles. We finally left the sand and washouts and started a very long, heavy mountain climb over rough rocky roads having to adjust our carbureter two or three times on account of the high altitude.

"Our Blue Book route took us into Granger, Wyo., where we found we would have to ford a river about five feet deep or else go about 30 miles around by another route and we chose the latter, spending the night in a small mining town called Kemmever. Our next day's run took us into Ogden, where we left the car and went to Salt Lake City, spending 2 days sight seeing. We left Ogden on Wednesday, June 26, at 11 a. m., taking the northern route around Great Salt Lake via Promontory Point, a road little used by motor cars and in very poor condition

ROAD IN MT. RANIER PARK WITH MT. TACOMA IN BACKGROUND

as there is lots of sand and washouts, but we saved about 40 miles.

We spent the night in Lucin, on the main line of the Southern Pacific. From Lucin to Ely, which is about 200 miles, we had desert all the way—the Great American desert—but the roads were fine with a few exceptions. I might add that the best roads we found on the trip were in Nevada. On Saturday we drove from Ely to Tonopah, 189 miles, but were held up about 3 hours at a ranch called Current Creek, on account of a cloudburst, and on leaving this place we drove through water nearly 2 feet deep, as the road was all under water for about 7 miles.

"At times it looked as if we would have to wait for the water to run off, but we kept on and finally got on to higher ground and out of the rain belt. We arrived at Tonopah rather late and didn't leave until about 2:30 the next afternoon and made Big Pine, Cal., at midnight after the hardest mountain climb we experienced on the entire trip. We crossed three peaks in the White mountains, the highest being 7,900 feet and the lowest 7,000 feet. No car should attempt this trip by this particular route unless it has lots of power and good brakes. You go up and up for miles, but the descent is worse than the ascent, as it requires both the emergency and foot brakes to hold the car. Had one brake failed to work I shudder to think what might have happened. We crossed all of these peaks after night.

"Monday morning at 9 o'clock we left Big Pine, taking lunch at Lone Pine and leaving the latter place at 1:30 on our Mojave desert run. The first 20 miles after leaving Lone Pine the roads were very sandy and called for plenty of gear work. We blew out two casings, causing about 3 hours' delay. We had just got nicely started on the desert proper when we found that darkness was rapidly approaching.

"We held a consultation and decided to cross the desert that night, arriving in Mojave shortly after midnight. We had been dreading the desert part of the trip all the way, and were pleasantly surprised to find the road in such good shape. The most part of the road was smooth and hard and very easy to follow. Our last day's run was from Mojave to Los Angeles."

ASKS ROUTE TO BUFFALO

Winchester, Ind.—Editor Motor Age—I am going to make a trip to Buffalo, and would like to know the best route by way of Sandusky and Cleveland.—C. H. Davis.

Go to Ridgeville, Redkey, Petroleum, then east to Domestic, Berne, Mercer, Mendon, Monticello, Spencerville, Lima, Beaver Dam, Bluffton, Mt. Cory, Findlay, Arcadia, Fostoria, Bascom, Tiffin, Green Springs, Clyde, Castalia, Sandusky, Huron, Vermillion, Lorain, West Dover, Rocky River and Cleveland.

VIEW TYPICAL OF MISSISSIPPI ROADS AS FOUND BY THE FLANDERS PATHFINDER

Follow the routing as outlined for the inquiry from La Salle, Ill., but continue from Westfield, Pa., on to Buffalo instead of heading for Lake Chautauqua. The entire distance is in the neighborhood of 475 miles.

ILLINOIS TO NEW YORK

La Salle, Ill.—Editor Motor Age—Kindly give me the route from La Salle, Ill., to Lake Chautauqua, N. Y., thence to Niagara Falls, and return home by way of the Canadian route. Is it advisable to return by way of Canada?—W. W. Greaves, M. D.

Your route lies to South Bend and leads through Utica, Ottawa, Marseilles, Morris, Channahon, Joliet, Gaugers, New Lenox, Frankfort, Richton, Dyer, Schererville, Merrillville, Deep River, Valparaiso, Westville, Pinhook, Laporte, Stillwell, South Bend.

Toledo is 164 miles distant through Mishawaka, Osceola, Dunlap, Goshen, Benton, Ligonier, Wawaka, Kendallville, Waterloo, Butler, Edgerton, Bryan, Archbold, Wauseon, and Crissey, but it is not necessary to go further than Bryan towards Toledo, as a road branches off here for Cleveland and routes through Ridgeville, Napoleon, Liberty Center, Bowling Green, Pemberville, Woodville, where the road from Toledo comes in, and continues to Fremont, Clyde, Bellevue, Monroeville, Norwalk, Townsend, Wakeman, Oberlin, Rock River, and Cleveland. Cleveland to Erie is 101 miles along the lake shore through Wickliffe, Willoughby, Painesville, Madison, Unionville, Geneva, Saybrook, Ashtabula, North Kingsville, Conneaught, West Springfield and Girard.

Point Chautauqua is 41 miles from Erie and you will pass through the towns of Wesleyville, Northeast, Ripley, Westfield, Mayville, and Hartfield.

For Buffalo and the Falls return to Westfield, and route through Brocton, Fredonia, Silver Creek, Irving, Buffalo, and Tonawanda.

Returning by way of Canada, to Hamilton, which is 51 miles, the itinerary is St. Davis, St. Catherines, Jordan, Grimsby, and Hamilton. Port Huron is 143 miles distant, the intermediate towns being Alberton, Brantford, Cathcart, Woodstock, Ingersoll, Thamesford, London, Hyde Park, Adelaide, Warwick Village, Kertch, Sarnia and the ferry to Port Huron. Continue through St. Clair,

Muttonville, Mount Clemens, Detroit, Dearborn, Wayne, Ypsilanti, Ann Arbor, Lima Center, Chelsea, Grass Lake, Jackson, Albion, Marshall, Battle Creek and a mileage of 187. The next stretch is through Galesburg, Kalamazoo, Paw Paw, Dowegiac, Summerville, Niles, and South Bend, retracing the going route back home to La Salle.

TO THE PACIFIC COAST

San Angelo, Tex.—Editor Motor Age—Give me a route from this place to Los Angeles, Cal. I want the southern route. —C. R. Webb.

Your line of march will take you to Carlsbad, Sterling City to Big Springs, from which point you are referred to the answer to an inquiry from Anson, Tex. It is in the neighborhood of 85 miles to Big Springs.

TO ROANOKE, VA.

Delphos, O.—Editor Motor Age—I am contemplating a trip from here to Roanoke, Va. I would like the best routing, with road conditions. I also want to go to Winchester, Ky. Is there a route following the C. and O. railroad from Roanoke to Winchester? I have taken the trip from here to Chattanooga and know what bad roads are.—C. C. Kitts.

Go through Elida to Lima, which is about 13 miles, then to Columbus, 89 miles, through Westminster, Holden, Roundhead, Huntsville, Bellefontaine, Zanesfield, Middleburg, Marysville, Dublin and Columbus. So far the road is principally gravel.

From Columbus to Wheeling, W. Va., over the National highway, you travel a distance of 128 miles, routing through Reynoldsville, Etna, Kirkville, Hebron, Jacktown, Linnville, Brownsville, Hopewell, Zanesville, Norwich, New Concord, Cambridge, Washington, Elizabethtown, Fairview, Hendricksburg, Morristown, Loydsville, Bridgeport and Wheeling.

Still following the National highway through West Alexander, Claysville, Washington, Beallsville, Brownsville, Uniontown, Somerfield, Petersburg, Keyser's Ridge, Grantsville, Frostburg, Elkhart, Cumberland, Flint Stone, Hancock and Clear Springs to Hagerstown, which is 200 miles.

For a visit to the battlefield of Gettysburg it is a run of 34 miles over a stone road on which toll is charged almost the entire distance. The towns passed through are Leitersburg, Waynesboro, Rouzerville, Fountaindale and Fairfield.

There are two roads you can take to Winchester, one being 42 miles over a stone road, the other 53 miles over pike; both have toll charges. The first mentioned routes through Williamsport, Falling Waters, Berkeley, Martinsburg, Clarksville, Bunker Hill, Winchester; the second is through the towns of Tighmantown, Antietam, Sharpsburg, Shepherdstown, Halltown, Charlestown, Clifford, Berryville.

You will find it a distance of 91 miles to Staunton through Middletown, Strasburg, Maurertown, Woodstock, Edinburg, Mt. Jackson, New Market, Harrisonburg, Mt. Crawford, Burkstown and Verona; and 89 miles to Roanoke over a good dirt road with several stretches of macadam over very rolling country through Minte Springs, Greenville, Midway, Fairfield, Lexington, Fancy Hill, Natural Bridge, Buchanan, Troutville, Cloverdale and Roanoke.

Motor Age knows of no route for you to follow to get beyond the Alleghany mountains into Kentucky except by shipping your car, and picking up a road at Pikeville, Ky. To route by motor car the entire distance over the most feasible road, which in itself is very bad in stretches, would take you through Winston-Salem, N. C., Charlotte, Greenville, S. C., Atlanta, Ga., Chattanooga, Tenn., Knoxville, Cumberland Gap, Mt. Vernon and Winchester. From Pikeville, Ky., a road lies through Paintsville and Campton to Winchester.

Blue Book Road Reports

The Blue Book car which has just completed over a month's work in Ohio reports the following on new and old routes:

Zanesville to Cincinnati via Lancaster, Circleville and Washington Court House is good gravel and stone road all the way over slightly rolling country, making an enjoyable trip, and to Jeffersonville and Springfield is fine gravel or macadam.

Cincinnati to Springfield via Lebanon and Xenia is also good gravel all the way, making an important connection for through trips into the northern part of the state.

A new route is from Cincinnati to Dayton via Hamilton, Middletown and Miamisburg. Although not very well known or as much used as the older route via Lebanon, this is not only an excellent option but fully as good as the other route and highly recommended.

Cincinnati to Columbus via Lebanon, Dayton and Springfield, although a hard road all the way, certain parts of it are badly cut up due to heavy travel. Considerable work is being done on this route, however, and it should be considerably improved for next year although not very bad at this time.

Columbus to Washington Court House via Harrisburg and Mt. Sterling is over fine macadam for the first part and then good gravel the remainder.

A new route from Cincinnati to Maysville, Ky., via Newport, Alexandria, Grants Lick, Brooksville and Moranburg, is slightly longer than the river road but good stone pike all the way, a little rough in spots but not bad at any time.

Maysville to Hillsboro via No. Liberty and Winchester is a new route. This is over real country most of the way and road conditions are far from being good. It can not be recommended as a tourist route.

Another new route is from Hillsboro to Portsmouth via Peebles and Otway. The Blue Book car covered this route trying to find a feasible direct connection between Cincinnati and Portsmouth and after careful inquiry this seemed to be the most advisable feature. Conditions between Hillsboro and Portsmouth are found to be the worst so far encountered in Ohio and should not be used by those who are not prepared for the roughest kind of going.

ILLINOIS TO SOUTHERN TEXAS

Varna, Ill.—Editor Motor Age—Kindly furnish the best and most direct touring route from Peoria, Ill., to Mercedes or Mission in Southern Texas. These towns are on the old military highway from Fort Sam Foryce to Brownsville.—A. R. Wright.

A good road to Keokuk is through Farmington, Fairview, Ellisville, Prairie City, Bushnell, Blandinsville, La Harpe, Carthage, Elvaston and Hamilton. You now are referred to the answer to the communication from Keokuk, Ia., for the road across Iowa over the Waubonsie trail and on into Nebraska as far as Fairmont.

The trip from Fairmont to San Antonio will be found outlined in the request from Sioux Falls, S. D., to Laredo, Mex. The balance includes the following towns: Calveras, Floresville, Poth, Falls City, Karnes, Kenedy, Pettus, Normanna, Beeville, Skidmore, Alice, Kingsville, Raymondville, and McAllen with Mission lying to the northwest and Mercedes to the south reached through Pharr, San Juan, and Donna. The Blue Books 4 and 5 will only give you running directions as far as Fort Worth. From that town to Skidmore you can secure a route guide from Dawson & Potter of Fort Worth, but there is no log of the balance of your trip to our knowledge.

IOWA TO COLORADO

Keokuk, Ia.—Editor Motor Age—Kindly give the best route from Keokuk to Denver, Colo.—S. Hamill.

The Waubonsie trail is your route across Iowa, and according to recent reports seems to be one of the best signboarded roads in that section of the country. Telephone poles are marked with black and white bands at all intersections. To Centerville it is 110 miles, routing through Mt. Clara, New Boston, Charleston, Donnellson, Primrose, Farmington, Mt. Sterling, Cantril, Milton, Pulaski and West Grove. The balance of the trail to Nebraska City, 178 miles, is Jerome, Promise City, Corydon, High Point, Leon, Decatur City, Kellerton, Mt. Ayr, Conway, Gravity, Clarinda, Shenandoah, Sidney and Knox, then crossing on a toll bridge into Nebraska. When at Shenandoah, you might call upon Henry Field, who has returned recently from a trip to Denver, and doubtless he can give you some valuable assistance.

A distance of 159 miles over the Omaha-Denver transcontinental route will find you in Hastings. This trial is also well marked with black and white bands on telephone poles. The towns to pass through are Dunbar, Syracuse, Unadilla, Palmyra, Lincoln, Emerald, Milford, Friend, Exeter, Fairmont, Grafton, Sutton, Saronville, Harvard and Hastings. To McCook it is 146 miles, passing through Minden, Axtell, Holdredge, Atlanta, Oxford, Edison, Arapahoe, Holbrook, Cambridge, Bartley, Indianola and McCook.

Continuing on this trail you will reach Sterling, Colo., a distance of 167 miles, by routing through Culbertons, Beverly, Palisade, Wauneta, Imperial, Lamar, Holyoke, Haxtum and Sterling.

The next stretch is 146 miles to Denver, where excellent time should be made. The itinerary is Atwood, Hillrose, Brush, Fort Morgan, Bennett, Watkins and Denver.

It is more possible to travel over the above roads without a guide than any other between Keokuk and Denver at the present time, but should you want running directions the Omaha-Denver trans-

continental route guide published by the Iowa Publishing Co., Des Moines, Ia., will give you such from the Missouri river to Denver. The entire trip is also found outlined in the Blue Book No. 5 among numberless others west of the Mississippi and will serve to guide you on future trips.

GOING TO SOUTH DAKOTA

Grayslake Ill.—Editor Motor Age—Please outline a route from Grayslake, Ill., to Elkton, S. D., via Dubuque, Ia. Also, a routing from Grayslake to Wichita Falls, Tex.—C. E. Allen.

Your distance to Dubuque, Ia., is 162 miles. You can route through Hainesville, Volo, McHenry, Woodstock, Harvard, Chemung, Belvidere, Cherry Valley, Rockford, Freeport, Lena, Wadham, Nora, Warren, Shullsburg, Leadmine, Benton, Hazel Green, Fairplay, Dubuque.

Follow the Hawkeye highway across Iowa, which routes through the following towns: Julien, Centralia, Farley, Dyersville, Earlville, Manchester, Independence Waterloo, Cedar Falls, New Hartford, Parkersburg, Austinville, Ackley, Iowa Falls, Alden, Williams, Blairsburg, Webster City, Fort Dodge, Barnum, Manson, Pomeroy, Fonda, Newell, Sulphur this distance 262 miles. Leaving the Springs and Storm Lake. You will find highway and heading north you should route through Truesdale, Rembrandt, Sioux Rapids, Spencer, west to Hartley, Sheldon, Perkins, Doon, Rock Rapids, Lester, Larchwood, Banclare, and Sioux Falls, being approximately 143 miles.

The Meridian road is now followed to Dell Rapids and Flandreau. Elkton is only a short distance to the north of Flandreau.

For the routing to Wichita Falls, Tex., after reaching Rockford, Ill., head for Clinton, Ia., by way of Byron, Oregon, Dixon, Sterling, Morrison, Union Grove, Fulton, Lyons, and Clinton. The Iowa transcontinental route can be used to Ames by routing through Elvira, De Witt, Grand Mound, Calumus, Wheatland, Lowden, Clarence, Mechanicsville, Lisbon, Mt. Vernon, Marion, Cedar Rapids, Belle Plaine, Chelsea, Tama, Montour, Marshalltown, State Center, Colo, Ames.

Des Moines is 32 miles south of Ames and reached via Hukley and Ankeny; and the River-to-River through Waukee, Ontarioville, Adell, Redfield; the White Pole to Dexter, Stuart, Menlo, Casey, Anita, Wyota, Atlantic; thence the River-to-River to Marne, Walnut, Avoca, Minden, Neola, Underwood, Weston, Council Bluffs and Omaha.

The balance of the route to Wichita Falls is incorporated in the answer to an inquiry from Sioux Falls, S. D., in this issue. All running directions included in Blue Books 4 and 5.

TOURING IN THE EAST

Ellis Island, N. Y.—I want to make a trip from New York to Boston via Springfield, Mass., and would like the best route and distance. Also would like another route from New York to Williamsport, Pa., and Harrisburg, Pa.—M. H. Foster, M. D.

The shore line route to New Haven unfortunately is in very little better condition this year than it was last, but there are no serious detours on account of road construction. It is a distance of 74 miles through Columbus circle, New Rochelle, Larchmont, Mamaroneck, Rye, Portchester, Greenwich, Ct., Coscob, Mianus, Stamford, Darien, Norwalk, Westport, Southport, Fairfield, Bridgeport, Straford, Milford, and New Haven.

The best road to Hartford, Conn., is 37 miles through Wallingford, Tracy, Merider, Berlin; and Springfield lies 27 miles north if the road on the east side of the river is taken through East Hartford, South Windsor, Warehouse Point, Enfield, Thompsonville, Longmeadow, Springfield. If the west side of the river is chosen you will find it 26 miles through Windsor, Windsor Locks, Suffield, and Springfield. A suspension bridge connects Warehouse Point and Windsor Locks which enables you to cross over and finish on the opposite side of the river if preferred.

The balance of the route lies through Worcester, 51 miles, and Boston, 44 miles. The towns are Masonic Temple, N. Wilbraham, Palmer, West Warren, Warren, W. Brookfield, Brookfield, Spencer, Leicester, Cherry Valley, Worcester, Shrewsbury, Northboro, Marlboro, S. Sudbury, Wayland, Weston, and Boston.

TO NIAGARA FALLS

Baraboo, Wis.—Editor Motor Age—We are contemplating a trip through Milwaukee, Grand Haven, Detroit, Toledo, Cleveland, etc., to Niagra Falls. What is the best route from Grand Haven to Detroit? How many miles, and what is the character of the road?

Will a Wisconsin license be honored in Michigan, Indiana, Ohio, Pennsylvania and New York? Any further information or suggestions will be appreciated.—A. G. Gollmar, Jr.

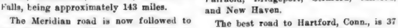
The section of the road from Grand Haven to Grand Rapids, a distance of 31.2 miles, is over good natural roads which take the motorist via Allendale. The 148.7 miles between Grand Rapids and Detroit is over an almost straight road with gravel practically all the way, which is good under ordinary conditions. Some of the intermediate points are Cascade, Lake Odessa, Sunfield, Grand Lodge, Lansing, Weberville, Fowlersville, Fleming New Hudson, Howell, Brighton, and Farmington. To reach Toledo your best route will be via Wayne, Ypsilanti, Saline Clinton, Tecumseh and Riga, with mileage of 92.9 miles, with fine macadam roads leading out of Detroit and int Toledo, with fair roads otherwise. Going eastward from Toledo with the next objective point Cleveland, you should pas through Woodville, Fremont, Clyde, Castalia, Sandusky, Huron, Vermillion, and Lorain, a run of 120.6 miles. Over good gravel or stone road all the way t Erie, Pa., the route is via Euclid, Willoughby, Painesville, Unionville, Geneva Ashtabula, Conneaught and Girard, making 101 miles; continuing toward Niagar Falls some of the wayside points will b North East, Westfield, Brockton, Fredonia Silver Creek, Irving and Evans to Buffal 89.6 miles; while to reach the Falls is further run of 21.6 miles through Tonawanda, over asphalt, macadam and bric roads.

Your Wisconsin license will exemp you from registering in the state named.

TEXAS TO LOS ANGELES

Anson, Tex.—Editor Motor Age— would like a route from Abilene, Tex. t Los Angeles, Cal.—N. C. Potts.

You will notice there is another inquir for this route from a party in San Angel Texas, and it is suggested that you communicate with Mr. Webb with the ide of the two cars traveling together. Yo



SANTA PALA MISSION IS BUT A SHORT JOURNEY FROM SAN DIEGO, CAL.

will find such a plan useful in many instances.

Through Texas the routing lies by way of Merkel, Trent, Sweetwater, Roscoe, Loraine, Colorado, Westbrook, Iatan, Coahoma, Big Springs, Stanton, Midland, Warfield, Odessa, Grand Falls, Ft. Stockton, Marathon, Alpine, Marfa, Aragon, Valentine, Wendell, Chispa, Lobo, Dalberg, Torbert, Grayton, Sierra Blanca, Etholen, Lasca, Finley, Ft. Hancock, Fabens, El Paso, having traveled 603 miles.

When in El Paso it would be well for you to call upon W. T. Rand, who has just recently returned from a trip to Los Angeles, and whose story appears in Motor Age of August 29. He will be able to give you some valuable pointers.

About 20 miles out you reach the New Mexico line and run through Canutillo, La Tuna, Berino, San Miguel, Aden, Cambray, Deming, Tunis, Gage, Willa, Separ, Lordsburg, and cross the Arizona state line to Vanar, San Simon, Bowie, Luzena, Glade, Wilcox, Cochise, Dragoon, Benson, Mescal, Vail, Wilmot, Tucson, Rillito, Red Rock, Florence, Mesa, Tempe, Phoenix, Coldwater, Liberty, Palo Verde, Arlington, Aqua Caliente, Castle Dome, Gila City and Yuma. From El Paso this is a distance of 665 miles.

Crossing the Colorado river into California you continue to Ogilby, Drylyn, Glamis, Mammoth, Brawley, Imperial, El Centro, Devil's Canyon, El Campo, Potrero, Dulzura, Jamuel, San Diego, La Jolla, Del Mar, Encinitas, La Costa, Oceanside, Las Flores, San Luis Capistrano, Irvine, Tustin, Santa Ana, Anaheim, Fullerton, Habra, Bethel, Whittier, Montebello, and Los Angeles. Yuma to Los Angeles is 362 miles.

This complete routing is outlined with maps and running directions in the No. 5 Blue Book, should you care to supply yourself with one.

COLORADO TO ST. PAUL

Delta, Colo.—Editor Motor Age—I would like to have a route outlined from Denver, Colo., to Lisbon, N. D., and from Lisbon to St. Paul.—H. E. Mathers.

Two decidedly different routes can be laid before you for your choice, and possibly you would like to go one way and return the other. The going trip might be as follows: Headed north from Denver better grades are to be found through Henderson, Brighton, Platteville, Greeley, Eaton, Ault, Pierce, Nunn, Dover, Carr and Cheyenne, Wyo., being a distance of 117 miles. When in Cheyenne it is advisable to call upon E. L. Emery, who is very familiar with surrounding road conditions and a very willing help to tourists.

A gradual down grade of 102 miles going east passing through Egbert, Pine Bluff, Bushnell, Kimball, Dix, Potter and Brownson find you in Sidney, where a road lies north called the Sidney trail, composed of natural dirt roads and leading into the picturesque mountains of the Black Hills country in South Dakota. Rapid City, S. D., is a distance of 247 miles and is reached through Alliance, Dunlap, Chadron, Oelrich, Hot Springs, Fairburn and Hermosa. If desired, a short run can be made to Sturgis and Deadwood.

Following the C., M. & St. P. east across the state with the exception of the last 40 miles before entering Sioux Falls, some of the intermediate towns are Caputa, Farmingdale, Creston, Scenic, Imlay, Conata, Interior, Weta, Kadoka, Belvidere, Stamford, Okaton, Murdo, Vivian, Kennebec, Reliance, Oacoma, Pukwano, Kimball, White Lake, Plankington, Mitchell, Emery, Bridgewater and Sioux Falls. Motoring a distance of 146 miles north from Sioux Falls by way of Dell Rapids, Brookings, Toronto, Clear Lake, Altamont, La Bolt, Milbank and Big Stone City takes you out of South Dakota and traveling 50 miles in Minnesota through Ortonville, Clinton, Graceville, Collis, Dumont, Wheaton and White Rock will find you in North Dakota and Wahpeton, 16 miles over the state line, reached through Blackmer, Fairmont and Tyler. Lisbon is in the next county and you can secure directions at the Wahpeton garage.

The second route leaves Colorado by way of Fort Morgan in a northeasterly direction over a good fast road passing through Watkins, Bennett, Fort Morgan, Hillrose, Merina, Sterling, Iliff, Red Lion, Sedgwick and Julesburg, 210 miles. Entering Nebraska 5 miles out of Julesburg, the North Platte road is followed. To Kearney it is 197 miles and can be made in a day routing through Brule, Ogalalla, Roscoe, Korty, Paxton, Sutherland, North Platte, Maxwell, Gothenburg, Millow Island, Lexington, Overton, Elm Creek and Kearney. The next stretch is to Omaha, 195 miles, passing through Gibson, Shelton, Wood River, Alda, Grand Island, Chapman, Central City, Clarks, Havens, Duncan, Columbus, Benton, Schuyler, North Bend, Ames, Fremont, Waterloo, Elkhorn and Omaha. There are a few stretches of sand on this North Platte route, but on the whole it is practical.

Rolling country predominates in Iowa along the river from Omaha to Sioux City, Ia., through Council Bluffs, Crescent, Reels Store, Missouri Valley, River Sioux, Onawa, Whiting, Sloan, Salix and Sioux City. Crossing the Sioux river into South Dakota continue to Jefferson, Elk Point, Beresford, Worthing and Sioux Falls, from which point the route has already been outlined.

En route for St. Paul, although not necessary, you might like to go to Fargo, which lies through Enderlin, Alice, Buffalo, Wheatland, Casselton and Mapleton. Fargo to Alexandria, Minn., is 124 miles and reached through Barnesville, Rothsay, Fergus Falls, Ashby, Melby, Evansville, Brandon and Garfield. Alexandria to Minneapolis is a 140-mile stretch passing through Osakis, Sauk Center, Melrose, Freeport, Albany, Avon, St. Joe, St. Cloud, Clear Lake, Becker, Big Lake, Elk River, Dayton, Anoka, Osseo and Robinsonville. Follow University avenue into St. Paul. This is practically an all-dirt road with the exception of between Alexandria and St. Paul, where there are a few stretches of gravel and sand.

If you do not want to go to Fargo, return to Wahpeton, meeting the above outlined route at Fergus Falls.

SIOUX FALLS TO LAREDO, MEX.

Sioux Falls, S. D.—Editor Motor Age—I would like very much to obtain the best route from Sioux Falls to Laredo, Mex.—H. H. Parshall.

Route first to Omaha, Neb. which will be your first night's stop at a distance of 196 miles, by way of Worthing, Beresford, Elk Point, Jefferson, Sioux City, Salix, Sloan, Whitney, Onawa, River Sioux, Missouri Valley, Loveland, Honey Creek, Crescent, Council Bluffs and Omaha. Follow the Omaha-Denver transcontinental route 58 miles through Millard, Gretna, Ashland, Waverly, Havelock, Lincoln, Emerald, Milford, Friend, Exeter and Fairmont, then head south on the Meridian road through Strand, Bruning, Belvidere, Hebron, Chester, Belleville, Concordia, Minneapolis and Salina, which will be 142 miles.

Keeping on the Meridian road straight through Kansas are the towns of Bridgeport, Lindsborg, McPherson, Moundridge, Heston, Truesdale, Newton, Wichita, Wellington, South Haven and Caldwell and so far will register 164 miles.

The Chisholm trail extends through Oklahoma and routes through Renfrow, Medford, Pond Creek, Kremlin, Enid, Waukomis, Hennessey, Dover, Kingfisher, El Reno, Pocasset, Chickasha, Verden, Anadarko, Apache, Rohrer, Lawton, Emerson, Randlett, being about 290 miles. At El Reno which is 122 miles you can turn east and a distance of 27 miles will find you in Oklahoma City.

Burkburnett is the first town in Texas after crossing the Red river on the toll bridge and the route to Ft. Worth lies through Wichita Falls, Windthorst, Antelope, Jacksboro, Whitt, Adell, Weatherford, Annetta, Aledo, Ben Brook and Ft. Worth which is 160 miles.

Between Ft. Worth and San Antonio—315 miles—the towns along the popular route lie through Cleburne, Grandview, Hillsboro, Itaska, Hillsboro, Abbott, West, Waco, Temple, Granger, Georgetown, Round Rock, Austin, Buda, San Marcos and New Braunfels.

A road follows the railroad to Laredo but between San Antonio and Pearsall it is so sandy that most prefer to go by way of Castroville, and Hondo to Pearsall and then follow the tracks across the Frio river and thence through Dilley, Cotulla, Encinal, Cactus and Laredo. This is about 180 miles.

Among the Good Road Enthusiasts

Michigan Reports on Highways Cost—Blazing the Meridian Trail

LANSING, Mich., Sept. 9—State Highway Commissioner Ely furnishes the following on the progress of good roads building in Michigan since the state highway department was established 7 years ago:

The first year, 1906, the department spent $30,000 for road improvement. In subsequent years the expenditures were: $60,000 in 1907; $110,000 in 1908; $160,000 in 1909; $150,000 in 1910; $150,000 in 1911; $245,000 in 1912. For 1913 there are $245,000 available. This money, however, does not nearly represent the total spent on roads in Michigan, most of this money being paid out in rewards for good roads constructed by townships.

There are forty-six counties under the good roads system. For every mile of class A road the state pays $250; for every mile of class B road, $500, and for every mile of class C road, $750, and for every mile of class E and F road, $1,000.

In April, 1912, a number of counties voted to bond for good roads, these, with the amounts, being as follows: Genesee, $500,000; Kent, $600,000; Ottawa, $500,000. In Kenzie county several townships decided to bond as follows: Avon, $10,000; Baraga, $10,000; Weldon, $10,000; Benzonia, $15,000; Homestead, $20,000.

For the fiscal year ending June 30, the counties above enumerated applied for aid in building 644 miles of road. Up to date this year there have been built 382 miles, while before the end of the present fiscal year it is expected 500 miles will have been built.

Since the department was created 1,232 miles have been built with state aid, while applications for state aid are on file for 865 miles more. The total amount of state aid given since 1906 has been $835,000.

On November 5 the taxpayers of Delta county will vote on a proposition to bond for $100,000 for good roads. September 14 the township of South Haven, Van Buren county, will vote on a proposition to bond for $25,000.

LONDON USING GRANITE

London, Sept. 1—Granite is displacing wood pavement in several London streets. In some quarters an outcry is made that the metropolis is going back to the old cobblestone days, to become a noisier city than ever. In the view of experts there is no greater mistake. The prepared granite now in use, they say, bears no comparison to the antiquated cobblestones. The advent of heavy motor traffic has so enormously increased the cost of road upkeep that the matter is of vital interest to rate payers.

Some of the local authorities are paving short experimental stretches of road with granite, saying it is not insanitary like the wood pavement, which absorbs refuse, and has not a tendency, like asphalt, to dissolve or rot under the drip of oil or gasoline.

The principal objection to granite was the noise, but this has been overcome by laying the prepared granite in segmental courses of crescent shape on a tar bed, which absorbs the noise. A mixture of boiling pitch and oil is forced into the joints of the stones and the pitch mixes with the bottom bed and makes a solid carriageway. In some cases the blocks are laid on sand and, lying in segmental courses, there is no undue wear. It increases the foothold for horses. On cobblestones the horse stepped on only one block, which might be slippery. Under the new system it gets a foothold on three or four.

BLAZING MERIDIAN TRAIL

Winnipeg, Can., Sept. 9.—Under the auspices of the International Road Association, a tour for the purpose of exploring and advertising the new Meridian road, from this city to Dallas, Texas, will start tomorrow. An official log will be made of the road and topographers will prepare a map detailed for use in the Blue Book. Cities along the way are expected to entertain the tourists. It is expected that this route, which has been extensively improved, and thoroughly sign-boarded, will become popular, as soon as it is given the proper amount of publicity.

The itinerary contemplates runs of over 100 miles per day, through Grand Forks, N. D., Wahpton, Watertown, S. D., and Bridgewater, S. D., reaching Norfolk, Nebr., on Sunday night. Sunday will be a day of rest, the tour being resumed at 8:30 Monday morning, and continuing south through the states of Nebraska and Kansas to Wichita. Here the road forks, the route south continuing through Oklahoma City to Dallas, and returning via. Ft. Worth, El Reno, and Wellington to Wichita, where the tour will end. Side trips are planned through Lawton, Oklahoma, to Medicine Park and the Fort Sill military reservation; and to the 101 ranch near Ponca City, Oklahoma. In all it is expected that about 3 weeks will be consumed by the trip and close to 2000 miles will be covered.

CONNECTING LINK ALMOST CERTAIN

Toledo, O., Sept. 7—One of the dreams of motor enthusiasts in this section has been the reconstruction with good pavements of the old military road between Toledo and Detroit, which in the dim past was used by the stage coach. The old military road, which before it was used by Wayne, Winchester, Harrison and other heroes of pioneer fame, was an Indian trail, has been put into splendid shape and is one of the best roads in the country from Toledo to Chicago. The 10-mile stretch between Toledo and Maumee was completed only last year. At this time it was expected that the highway between Toledo and Detroit would become a fact.

The Ohio roads up to the state line were in fair shape but portions of the road between Toledo and Detroit in Michigan territory was impossible to use in anything but the best of weather. The improvement of this road, making a splendid stretch from Detroit to Chicago, was agitated by motorists of both Toledo and Detroit the members of the chambers of commerce of both cities taking a part in the agitation. These organizations at last decided that they would assist the counties in raising funds and it was believed that the road was an assured fact. Other difficulties however arose, some townships in Michigan territory narrowly opposing the improvement. After long and bitter controversy Erie township, which long had been a stumbling block, has voted a $40,000 bond issue for the construction of the highway. Bids were solicited and the lowest bid by a responsible firm was $41,000. The $40,000 fund voted is said to be the limit for Erie township and the Toledo good roads committee of the chamber of commerce has been notified that if Toledo and Detroit want the model highway between the cities constructed they must raise the $1,000 shortage in the road fund. C. A. Mauk, chairman of the Toledo good roads committee in discussing the matter declared that Toledoans are willing to contribute a fair sum to be distributed through the twelve townships through which the road must pass.

WANT ROAD TAX INCREASED

Indianapolis, Ind., Sept. 9—About 200 of the most prominent business men and concerns of the city have addressed a petition to the board of county commissioners, asking that the tax for highway improvements be increased from $3.15 on each $100 of taxales to 6.3 cents on each $100. This is the first time in the history of the county that business interests have demanded an increase in any tax levy.

Clarence A. Kenyon, president of the Indiana Good Roads Association, has appeared before the commissioners and the county council in the interest of an increased road tax levy. He pointed out that the roads leading into Indianapolis are in a deplorable condition and that such improvements as have been made, have not been made properly. The present road levy raises about $90,000 a year, which would be doubled under the proposed increase.

The Readers

Suggestions for Storage of Machines During Cold Months—Warning as to Proportions of Acid Oxidizing Agent—Guide for Locating Overheating Causes

Storing Car for Winter

Directions Outlined for Preparation of Car for Cold Weather Hibernation

LITTLE ROCK, Ark.—Editor Motor Age—How should a car be stored for about 5 months in the winter time?

2—Should the lubricating oil and gasoline be drained?

3—Should the grease be drained from the transmission and differential?—Putrodny.

1—The water should be drained from the cooling system, the gasoline from tank and carbureter, the batteries disconnected, the car thoroughly oiled and all openings, such as pet cocks and oil tape closed. The wheels should all be raised from the floor, and the tires wrapped in paper or burlap, the pressure in them being reduced to just sufficient to keep them properly distended when off the floor. The bright work should be covered, and the top, if of leather or pantasote, should be dressed in oil, raised in position and preferably covered. The brakes should be released, and the metal friction surfaces oiled to prevent rust. The clutch should be engaged, and the gear set in neutral. The car should be stored in a closed dry room, preferably warmed.

2—Gasoline, yes; oil, no.

3—No.

QUERIES ON THE CUTOUT

Madison, S. D.—Editor Motor Age—Does the cutout add any power to an engine?

2—What are its advantages or disadvantages?

3—What was date of back number of Motor Age giving tests on the cutout?—W. A. Rothschild.

1—Yes, usually.

2—The advantages of a cut-out are that the power is usually increased slightly by the reduction of back pressure, and the sound, being more audible enables the operator to better diagnose the running of his motor, and govern his control accordingly, with the result that gear-changes are more likely to be made at the proper moment, and the likelihood of killing the motor is reduced to a minimum.

3—June 18, 1912.

PICRIC ACID PROPORTIONS

Tecumseh, Mich.—Editor Motor Age—For fear you may lose a constant reader and be confronted with an undertaker's bill, I beg to call your attention to the instructions which you gave J. C. Burns, of Minneapolis, on page 28 of your issue of Aug. 22, on the use of picric acid.

If Mr. Burns uses one ounce of picric acid and two ounces of sal ammoniac to each five ounces of gasoline in his tank, he may continue to burn for some time.—P. W. A. Fitzsimmons.

Motor Age is very grateful to Mr. Fitzsimmons for calling attention to the typographical error, which as he suggests might lead to disastrous results. The formula should read 5 gallons of gasoline instead of 5 ounces.

CAUSES OF COOLING TROUBLES

Buffalo, Okla.—Editor Motor Age—Please tell me how to stop the heating of a motor car engine. This engine heats when run about 5 or 6 miles, and boils all the water out when the water pump works good. Could the trouble be in the magneto timer? If so, how do you set it? This one has marks on it. It is a low-tension Splitdorf magneto. The car in question is a model J Mitchell.—Max Schobel.

The causes of overheating are so numerous that to attempt to locate your trouble with no more particulars than are given in the above communication is guess work at best. The rule in locating the cause of trouble of this nature, however, is to go over every part of the ignition, cooling, lubrication and carburetion systems to locate any fault that could cause heating. One of the most frequent causes, perhaps, is the mistiming of the spark. The spark should be timed on a model J Mitchell in the order 1-3-4-2, with full retard on center.

It being determined that the spark is in proper time, your degree of advance in driving should be closely watched, remembering that economy and a cool engine depend upon as advanced a spark as it is possible to carry without knocking, or loss of flexibility. The adjustment of your platinum points, in both the circuit breaker and coil should be examined, remembering that the adjustment on these members should be as light as possible to avoid missing. Overheating is frequently caused by stiff vibrators, which consume a great deal of current, generate a large spark, but owing to the greatly increased volume, the speed of such a current is slow, with a resultant lag, which acts as a retarded spark.

The condition of the cylinders, both in the water jackets and the combustion chamber should next be thoroughly investigated, every vestige of carbon being removed, and sand, scale or other obstructions in the water jackets thoroughly cleaned out. The water passages should be gone over to locate any possible clogging here, as should the radiator. The pump should be examined, to see that it is working properly. The circulation may be tested by disconnecting the outlet of the engine or radiator, and introducing some aniline color, ink, or dye into the radiator. The length of time required for it to reach the outlet, and the degree of solution will indicate the speed and volume of circulation. With the engine warm, the tubes of the radiator should be felt to find if any are clogged. If so, they will be cool, even though full of water.

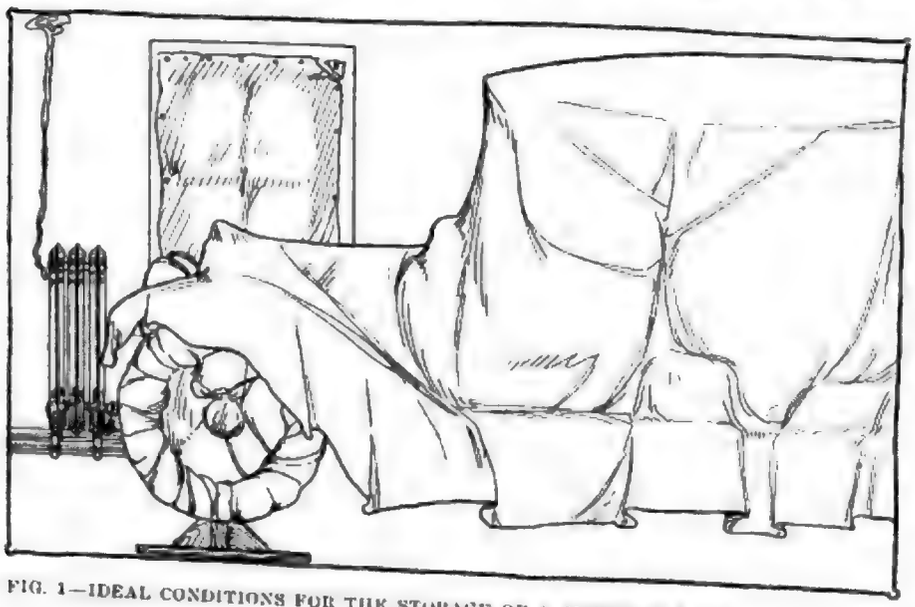


FIG. 1—IDEAL CONDITIONS FOR THE STORAGE OF A MOTOR CAR IN COLD MONTHS

Clearing House

Short Intake Passages Given Preference—Famous Racers Dissected—Tire Sizes and Weights of Chalmers 1913 Cars—Lost, a Pump Maker

It being determined that the cooling system is in good order, the lubrication should next be investigated. The condition of all bearings and of the cylinders, in respect to oiling, should be carefully investigated. Sufficient oil should be fed to the cylinders to almost smoke.

Carburetion is to be blamed last, in spite of the fact that it is a frequent offender, for the reason that most drivers find tinkering with this much abused part too easy. The adjustment of a carbureter should be very delicate and precise, and should only be changed by a man who really understands the true function of the adjustments, and has had sufficient experience to judge the results accurately. The rule, in adjusting the carbureter for cooling troubles is that overheating, if the fact can be established that it has its seat nowhere else than in the carbureter, is caused by an over-rich mixture.

MORE RACING SPECIFICATIONS

Waukomis, Okla. Editor Motor Age—What are the specifications and by what company are each of the following cars built—Jay-Eye-See, Christie, Whistling Billy and Simplex Zip.

2—What is the gear ratio of the Overland model 61 F, and how many miles per hour will it make?

3—Will a four-cylinder motor, with a bore of 4 inches and a stroke of 6 inches, develop more power than one 4½ by 5¼?

4—Can a 35 by 5-inch tire be used on a 34 by 4-inch rim?

5—Did the Overland Company ever build six-cylinder cars?

6—What are the specifications of the eight-cylinder de Dion-Bouton?

J. H. Strickler.

1—The specifications of these cars are:

Car	Bore	Stroke	No. cyl	H. P.	Drive	Power
Jay-Eye-See	9¾	8⅝	4	290	Chain	Gas
Christie	7½	7	4	210	Front	Gas
Whistling Billy	...	...	...	...	Shaft	Steam
Simplex Zip	5¾	5¾	4	90	Chain	Gas

The makers are: Jay-Eye-See, assembled, with Fiat motor; Christie, Walter Christie; Whistling Billy, the White Co.; and Simplex Zip, Simplex Automobile Co.

2—The Overland 61 F is manufactured with gear ratios of 3¾ to 1 and 3½ to 1, and is claimed to be capable of 55 miles per hour.

3—According to the modified S. A. E. rating, which takes into account the stroke and speed, a 4½ by 5¼, four-cylinder car will develop 34.4 horsepower at 1,200 revolutions per minute, while by the standard S. A. E. formula, such a motor would rate 32.4. A 4 by 6 motor, by the improved rating would rate 30.7 horsepower at the same speed, while by the standard S. A. E. formula, it shows but 25.6.

4—Oversize tires 35 by 4½ may be applied to 34 by 4-inch rims, but 35 by 5-inch tires must be applied to 35-inch rims.

5—The Overland company never has made a stock car with more than four cylinders.

6—Motor Age has no data on this car.

CONCERNING THE CHALMERS

North Platte, Neb.—Editor Motor Age 1—What type of steering wheel is used on the 1913 line of Chalmers cars? Is it a reversible or irreversible type?

2—What are the cylinder sizes and the actual weights of the Chalmers 30, 36 and six, five-passenger touring cars with complete equipment?—Burke Auto Co.

1—The steering wheel used on the 1913 Chalmers cars is of Circassian walnut, scalloped, 18 inches in diameter on the four-cylinder models, and 20 inches in diameter on the six. The steering gear is irreversible.

2—The cylinders on the 30 are 4 by 4½, and on the 36 and six they are 4¼ by 5¼ inches. The weight of the 30 touring car, fully equipped, is 2,650 pounds; of the 36, 3,250, and of the six, 3,850 pounds.

Length of Intake Pipe

Gas in Intake Manifold is Vaporized Rapidly; if Pipe is Long it Condenses

PRAIRIE VIEW, ILL.—Editor Motor Age—Which intake pipe will give the best gas for motor car engines, a long or short intake? In the Schebler catalog one is advised to connect the carbureter as close to the engine as possible.

2—In Motor Age, issue March 28, 1912, page 11, it is stated: "As gasoline leaves the nozzle it becomes finely divided and is carried along with the air at an increasing rate of speed until it would reach the same speed as the air or until it combines with it to form a gas." Would this gas formation take place in a short intake pipe, say 12 inches from the carbureter to the intake valve?—S. E. K.

1—Much diversity of opinion is expressed on this subject, it being generally conceded that there is a possibility of going to extremes in either direction. The prevailing preference among advanced engineers on this subject seems to be for short intake manifolds, of large diameter, and as direct and equalized passage as possible, as it has been found that long complicated passages present too much surface for radiation and possible freezing, and are apt to cause the vapor to condense.

2—Yes, this homogenizing process is very rapid, in a short capacious intake pipe, close to the heated cylinders; while in a long and narrow passage, the tendency would be to condense, thus ruining the mixture. This difference in effect may be seen in Fig. 2. About the only disadvantage in short intake pipes, properly designed, seems to be the raising of the gasoline level, impairing gravity feeds.

ADDRESS OF TIRE INFLATER WANTED

Memphis, Tenn.—Editor Motor Age—Will Motor Age, or some of its readers, give me the name and address of the maker of the Rector tire inflater?—Reader.

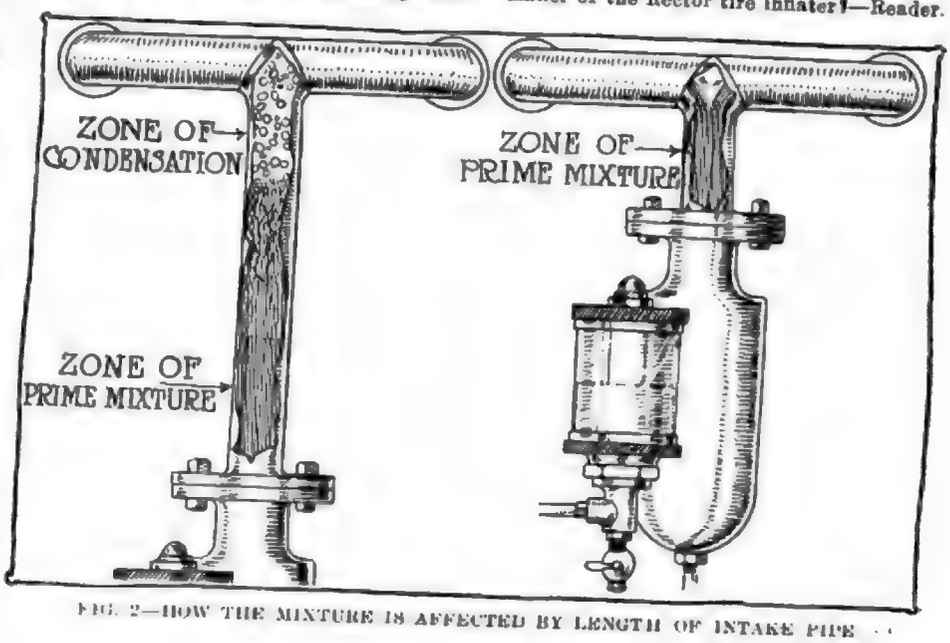


FIG. 2—HOW THE MIXTURE IS AFFECTED BY LENGTH OF INTAKE PIPE

Spark Plug Threads

Merits of Shouldered and Taper-Threaded Types Set Forth and Analysed for Iowa

MILFORD, Ia.—Editor Motor Age—What is the advantage or disadvantage of a ⅞ by 18 A. L. A. M. threaded spark plug over a ½ JN standard thread plug—the taper threaded? I know that the ½ JN standard plug tightens by the thread being tapered, and the ⅞ tightens by means of a copper washer at the base of the plug, but I desire to know the advantage one has over the matter.—R. E. Donaldson.

This is not a settled matter. If motorists agreed upon one type as superior to the other, the disfavored type would not be placed on the market. The adherents to the A. L. A. M. ⅞-inch threaded plug, with a gasket, claim superiority in view of the fact that owing to the cylindrical form of the threaded portion, there is no danger of cracking the cylinder, as with the tapered form by screwing in too tight. Those in favor of the tapered JN ½-inch thread argue, on the other hand, that the taper obviates the necessity of a gasket, insuring a tight joint at all times, and yet permitting its ready removal, when the cylinder cools, shrinking away from the plug. This makes unnecessary the tight screwing in a cold motor, necessary to secure a tight joint with a straight threaded, shouldered and gasketed type.

There can be no doubt that with the tapered thread, there is danger of carelessly screwing the plug in too tight in a cold motor, and consequent splitting of the cylinder upon its expansion when hot.

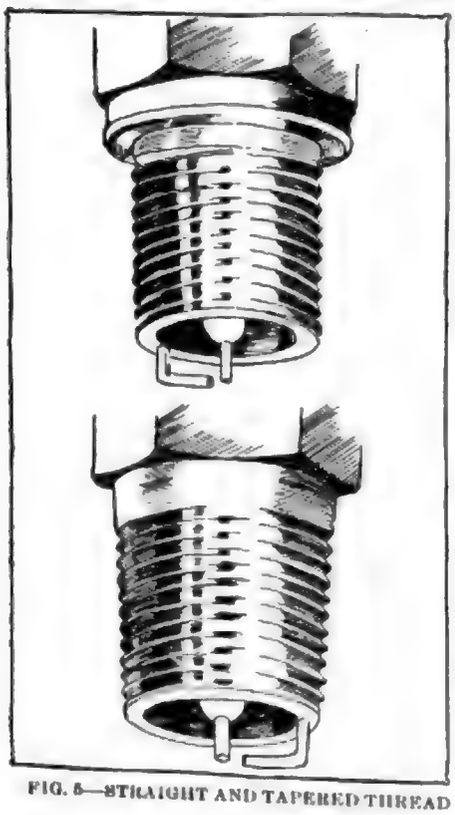


FIG. 5—STRAIGHT AND TAPERED THREAD

However, it is equally true that the tapered thread is much easier to insert, is simpler and cheaper to manufacture, automatically compensates for wear on the threads, and if properly used, is less liable to develop leaks than the gasketed type. The latter type is fool-proof, however, and makes a neater looking installation, which probably accounts for its popularity with high-priced cars.

FLYWHEEL SIZES AND WEIGHTS

Philadelphia, Pa.—Editor Motor Age—Will Motor Age kindly give a formula for the weight and size of flywheels? I have a formula for this but it does not take into consideration the number of cylinders. I should think, the greater the number of cylinders, the less weight the flywheel rim need have, until a motor has eight cylinders where no flywheel is needed except to attach the clutch to and in case of a disk clutch none would be needed. An electric motor, of course, needs no flywheel because it has an even turning torque at all points of the circumference of the armature, so that a single-cylinder motor would require the maximum.—L. F. Scheibner.

You are right in your belief that an increase in the number of cylinders lessens the necessity for a flywheel, but you are wrong in thinking an eight-cylinder motor smooth enough in action to dispense with the flywheel.

No flywheel is needed for a clutch mounting, as this member may be mounted on a light steel shell. Single cylinder motors have been put in motor cars with flywheels weighing as much as 1,200 pounds, giving them remarkably smooth action. Stationary gasoline motors are always equipped with heavy flywheels, usually far in excess of the weight actually required to pass dead center, and prevent jerks.

Stationary steam engines are likewise equipped with large and heavy flywheels, even though they have no dead center whatever, while locomotive engines on the other hand are without them. In motor car practice, the flywheel on multi-cylinder motors is reduced to as small size as possible, to still secure even running, and to pass dead center under load. It often has been urged, however, that too little attention is given by makers to the advantages of a heavy flywheel, and in their zeal for light weight, many have cut down the flexibility of their motors by using flywheels of too small size and light weight to conserve the engine's momentum under severe loads. No definite table can be laid down for the weight of flywheels, as this with the same type of motor would depend to a great extent on the design of this member itself.

As a general rule, however, it will be found that for the same results, an increase in the number of cylinders, normal speed, stroke, and balance of working parts permits a corresponding decrease in the weight and size of the flywheel.

Special Flander's Speed

Californian Supplements Instructions for Rebuilding Car for High Speeds

VENTURA, Cal.—Editor Motor Age—I noticed in a recent issue of Motor Age, and I again notice in the issue of July 18, discussion as to the speed ability of the Flanders 20.

My attention was first directed to the matter when a subscriber inquired with reference to securing a speed of 70 miles an hour from his Flanders, and the directions as to how the speed of his machine might be increased, lessening compression, etc. Nothing was said in these articles about increasing the gearing of the car from 4 to 1 to about 2½ or 2¾ to 1, or about changing the timing of the valves to open the exhaust early. I would like to inquire if Motor Age believes that this car can make 70 miles an hour with standard gearing on the level and without assistance? As I figure, this would require a crankshaft speed of over 3,000 revolutions per minute, and even the highest speed motors, like the Marmon, have never claimed such a speed for their engines.

I suppose these ideas originated from the reports of the Santa Monica races last held, where the newspapers gave the Flanders credit with making laps at the rate of 70 miles per hour or better. The cars undoubtedly made this speed, but those cars were equipped with the E-M-F motors, 4 by 4½ instead of 3¼ by 3⅝—considerable difference in size, you will admit—and because these cars were allowed to race under the term of stock Flanders, three California officers of the A. A. A. have been disqualified.

I hope that no Flanders owner has been beating his car up and down the road, after having tuned it up according to Motor Age's directions, and wondering what was the matter with the car, and why he couldn't make the speed.

The Flanders undoubtedly is a good car at the price, well built for the uses for which it is intended—an all-around serviceable car—but I do not think that through any act of omission the public should be allowed to gain the idea that these cars make 70 miles an hour without increasing the gearing and the size of the motor.—E. E. Moss.

The answer to which this correspondent refers appeared in this department of Motor Age May 16. In it, the suggestions offered by the maker for obtaining high speed were repeated. Among the suggestions, one was to advance the timing, which would open the exhaust earlier. It is certain that, without changing the gear ratio, as Mr. Moss suggests, the high engine speed necessary could not be maintained for any length of time, if it could be reached. It does not pay the amateur to attempt to rival racing cars even when the same size of motor is used.

Duryea on Compression

Defends Statements Attacked by Tismer—High Crankcase Compression Is Repudiated

EDITOR Motor Age—I have read with interest Mr. Tismer's remarks and regret that he seems to have misunderstood me in some particulars. One cannot go into details to the fullest in the space available in your columns, and so must permit one's readers to take some things for granted. I, therefore, assumed that your readers would understand that there is a distinct lag between the position of the spark lever and the actual position of the ignition; and a still further distinct lag between the occurring of the spark in the cylinder and the complete combustion of the gases. Many indicator or manograph cards show the ignition point with a second rapid rise in pressure thereafter, and by adjusting the indicator or manograph, so as to have the card moving rapidly instead of standing still, at the end of the stroke, this lag between the happening of the spark and the highest pressure point may be shown readily.

Further, engines generally are hotter when they are doing hard work than they are when running at fast speeds, also at such times the spark is not usually so far advanced, with the result that the highest pressure and heat point is after dead center rather than before. I mentioned this accepted fact simply to get a starting point from it to consider the heating of the cylinder walls. I did not intend to convey the impression that the heat of the burning charge precedes the pressure perceptibly, for I do not know that such is the case. We know that the heat is the cause of the pressure and we know that a perceptible and measureable time elapses between the spark and the completion of the combustion which marks the high point of heat production, but our most ready means of knowing that heat has been produced is by the pressure it produces, so I have assumed that the two were synchronous. Mr. Tismer bears out my contention by stating that maximum pressure does not come coincidently with smallest volume. If it came before, the additional compression would probably carry the pressure higher, so his remark, I understand to mean that he has noted higher pressure and presumably higher heats after dead center, in which belief he is undoubtedly right.

Regarding "a real good pump," Mr. Tismer certainly knows that for handling gases, a real good pump should have as little clearance as possible. The four-cycle has a large compression chamber and as a result, part of its pumping effect is expended in stretching out the contents of this chamber on the suction stroke and compressing into this chamber on the exhaust stroke, followed by some expansion and more stretching out on the next suction stroke. The crank case of the two-cycle engine is certainly a less efficient pump, both for suction and exhaust, than the cylinder of the four-cycle, for the reason above stated, and neither of these pumps will anywhere nearly approach 100 per cent volumetric efficiency except at practically stand-still speeds. Good authorities say that at moderately high speeds the average four-cycle does not get more than half charges and it is certain the two-cycle gets less. If Mr. Tismer has an engine which can fill the cylinder with fuel, he has what the ordinary two and four-cycle engines do not have.

I further admit that I would not care to undertake to produce an engine of the two-cycle type, having an ability to give 50 pounds compression in the crank case, for this would mean that the total clearance space would need to be reduced below one-third the piston displacement volume, and would require filling the piston, crank-case and even the connecting rod, with a lot of useless material. I say useless, because there is no advantage in a high crankcase compression. If suitable transfer passages are provided, the charge will get from the crankcase into the cylinder without need for a high crankcase pressure, which is negative work, and largely wasted when the charge is transferred. I prefer to keep this negative work as low as possible. The two-cycle only needs to be made somewhat larger than the four cycle for twice the maximum power, and when it is so made it will give more than twice the power of the four-cycle at moderate speeds, and thus largely avoid any need for changing gears. It is an excellent engine for heavy work, and this is one reason why it is used for boat service, where it is subject to hard, steady pulling from start to stop.

I abandoned hot tubes for automobile work twenty years ago, because I then took up throttled motor car engines, and the hot tube does not fire regularly unless the compressions and mixtures are regular. The two-cycle surpasses the four-cycle for hot-tube work, because it always has constant compression and will force the charge into the tube the same distance each time. I can, therefore, see considerable advantage in the hot tube for two-cycle work, because it will fire any kind of a mixture and probably the variations due to the quality of the mixture would not be such as to seriously interfere with the ignition time. But with the four-cycle, the varying compressions due to throttling often resulted in misfiring. If Mr. Tismer will send his address I may be of some assistance to him in the matter of lubricating his hot engine. I am a thorough believer in utilizing heat for power instead of for boiling useless water, and have spent considerable time finding an oil which is of higher fire test, and, therefore, better adapted to lubricating hot engines than most oils on the market.—Chas. E. Duryea.

Differential Discussion

Motorist Understands Function of Equalizer, but Is Hazy on Structure and Operation

NEW YORK—Editor Motor Age—Will you please illustrate and describe the action of the differential gear of a motor car. I understand that this device is to drive both rear wheels, yet allowing them to revolve at different speeds when rounding curves. If this is true, are not the differential gears of racing cars in continual action, and does this not involve a considerable extent of frictional loss?—O. L. H.

In Fig. 4 is shown the bevel gear type of differential, which is the simplest and most popular. The assembly complete as shown, consists of the bevel driving pinion, the driven bevel gear, and the differential. The driven gear is in the form of a ring, having four internal radial pins within it, upon which are four small bevel pinions, perpendicular to its axis and the axes of each other. These mesh on opposite sides with bevel gears secured to the inner ends of the divided and independent driving axles. When the wheels revolve at equal speeds, i. e., when the road resistance on each is balanced, the differential is inoperative, except as a clutch. Upon the unbalancing of the torque on the wheels, the bevels turn, causing one shaft to revolve faster than the driven gear, and the other slower in inverse ratio. This preserves the average speed of the two wheels at the same, regardless of the differential action. Your observation regarding differentials in racing cars is correct.

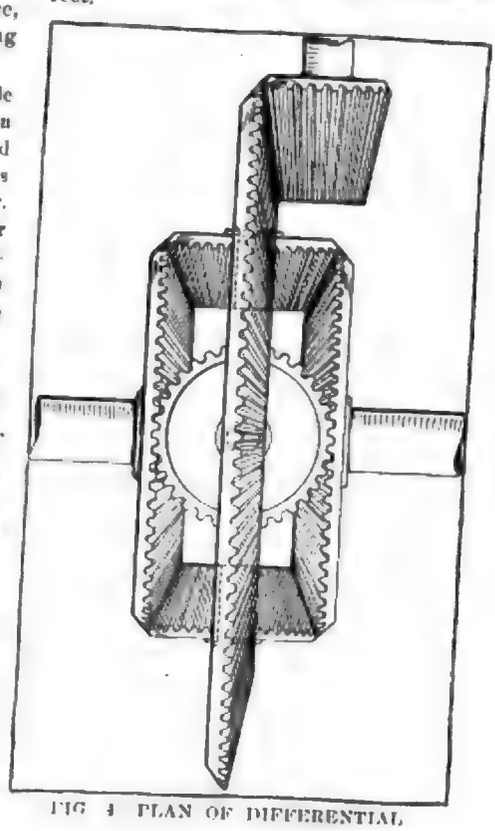


FIG. 4 PLAN OF DIFFERENTIAL

The Premier Little Six Makes Its Debut

FIG 1—PREMIER LITTLE SIX TOURING CAR SHOWING CLEAN LINES

The left-hand drive, bull's-eye post dash lamps and deep cowl are indicated. This shows the left-hand drive as well

WITH the introduction to the motoring public of the Premier Little Six comes the announcement that the Premier Motor Mfg. Co. will devote its attention solely to six-cylinder cars. The announcement that this company will build sixes exclusively in the season of 1913 does not come as a surprise, in view of the general tendency among makers of high-grade cars, nor is the decision to put out a six-cylinder car of smaller size than the present Premier six out of line with the general trend of the industry at the moment. This company commenced marketing six-cylinder cars as early as 1907, only a few at that time; in succeeding years the demand from the buying public has determined the ratio between sixes and fours built, until now the six has crowded the four out completely.

There is one point in the policy of the maker of the Premier as shown in the details of construction that is worth noting particularly before a description of the cars themselves is attempted. This point is the thoroughness with which the plans were laid to make the car easily kept by the owner in proper working condition. A study of the car reveals the fact that its maker has profited by its experience in reliability contests and is as well a tribute to the worth of rigidly conducted contests of this sort. The Premier concern was one of the early supporters of strict reliability contests and has used the information gained in such contests in guarding against weaknesses of assembly which would show up in use and in making all minor adjustments easy for the owner.

This care is illustrated in the fact that practically every nut, bolt and screw throughout the car is permanently locked so that it is impossible for it to jar loose, the maker going on the very excellent theory that if it is important that a bar or bolt be carefully adjusted, it is also important that provision be made that this adjustment will be maintained. This is shown, as well, in the fact that all permanently connected gears are integral with their shafts, instead of sacrificing the narrow margin of metal at the base of the gear to cut a key-way and thus localize the entire pull and strain at one point. In only one point throughout the car is there a key holding a revolving part and this is in the sliding gear for the air compressor pump where a moveable connection is required. There is still another point in which this attention towards easy maintenance is well illustrated and that is that on spring ends and all points where brake rods or other rods pass through the frame there are removable bronze bushings easily replaceable in case of wear.

With this aim of easy maintenance in mind let us look at the cars themselves

FIG. 2—INTAKE SIDE PREMIER LITTLE SIX MOTOR

Showing triple casting of cylinders, leads for compressed air starter and position of electric hor

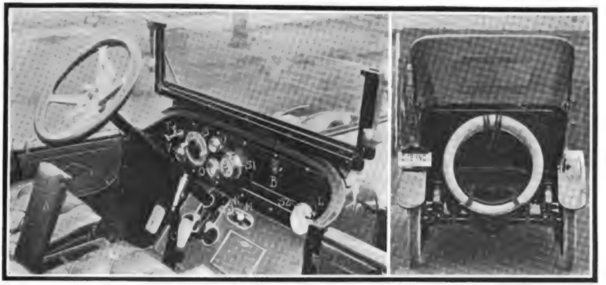


FIG. 3—SOME BODY FEATURES OF NEW PREMIER LITTLE SIX

The view of the tonneau compartment shows a commendable detail in the location of the fuel tank filler F between the two seats. To fill, the arm rest A is raised and the funnel inserted. On the dash at the extreme left is the hose connection T to the air tank for tire inflation. The rear view of the car illustrates the spare tire carrier and the electric taillight and number holder. N is a night shut-off for the air system

Premier cars for 1913 will appear in two models, both of them six-cylinder and known for the coming year as the Big Six and the Little Six. The Big Six car is the same car as was marketed as the model M-6 in 1912, with its motor of $4\frac{1}{2}$ by $5\frac{1}{4}$ inches bore and stroke and its cylinders cast in pairs. The only change of importance in the Big Six over this year's construction is in the steering rod connections which, instead of the ball joint used previously, will be a universal joint arrangement which will be described in more detail below. The Little Six is a new model differing only in its motor size and arrangement and in chassis dimensions.

The general design of Premier cars embraces a two-unit power plant consisting of a T-head six-cylinder motor and multiple disk clutch as one unit, and a three-speed sliding gearset as the other unit; a three-quarter floating axle and an I-beam front axle and heavy channel frame.

The motor of the Little Six has cylinders 4 inches in diameter by 5 inches stroke and practically the same construction is used as in the Big Six except that with a smaller bore of cylinder three cylinders can be combined in a unit so that the cylinders are cast in triplets. This permits placing the three cylinders close together, making a minimum distance between end bearings and center bearings. With these bearings it is not difficult to maintain rigid alignment of the crankshaft. As with the Premiers of the past the cylinders are cast with a large opening in the top of the water jacket which is covered with a light aluminum plate. The reason for such an arrangement is that it makes the foundry work more uniform so that the thickness of the cylinder and jacket walls would be the same throughout. This also makes possible the removing of lime deposits which may accumulate from the water circulation and the makers have found that this light plate will, as a, rule, give way when the motor is allowed to freeze up and will thus save the cylinder. After being cast the cylinders are pickled to remove core sand, then rough machined, heat treated to relieve the tension of the outside scale, bored, enameled and finally ground. The bore is said to be accurate to within .0005 inch. The pistons are of gray iron and the clearance between piston and cylinder is .003 inch. Each piston is fitted with three rings which are individual castings to give increased spring and life. The connecting rods are I-section drop forgings with large bearings, the crankshaft is machined from solid drop forgings. The engine base is made of a close grained semi-steel said to correspond to that used by the government in army coast defense mortars.

Lubrication of the motor is a circulating system with constant level splash, maintained by a gear-driven gear pump. There is a sight-feed glass on the dash, indicated at O in Fig. 3. In the lower half of the crankcase are molded transverse troughs. These have partitions between them so that the dippers on the ends of the connecting rods dip into oil on any grade below 27 per cent. The oil which overflows from the troughs drains into the reservoir in the rear and again is

FIG. 4—EXHAUST SIDE PREMIER LITTLE SIX MOTOR

Illustrating location of magneto and lighting generator as well as air distributer at the rear

FIG. 6—BRAKE CONSTRUCTION ON PREMIER CARS

The jaw clutch connecting hub and driving shafts in the axle with the wheel is shown at J

FIG. 7—THE MULTIPLE-DISK CLUTCH

forced back into the troughs. To the lower end of the connecting rods are screwed tubes which dip into the trough and throw the lubricant up into the cylinders. The oil is supplied through a filler pipe and breather in one arm of the crankcase and its height can be judged by a petcock in the side. Pockets in the bearing journals catch the oil and feed it direct to the bearings through oil holes.

The valves are completely enclosed and the push rods have rollers 1 inch in diameter which are ground inside and out. The push rod guides are die-cast bearing metal and are held in place by a forked clamp which when loosened permits two of them to be removed at once.

The cooling of the motor is by means of a gear-driven centrifugal pump and honeycomb radiator. The water is introduced at the lowest point of the waterjacket and comes out at the highest point. The pump is provided with a space on the outside of the plate so that if the pump were to become disabled the superheated water would rise and the circulation would continue in a reasonably satisfactory manner. In other words, it is a combination pump and thermo-syphon system. In addition to the radiator there is a fan immediately behind it which is driven by a belt from a pulley on the end of the pump shaft. Blade spokes on the flywheel act as an exhaust fan. The support of the radiator is unique in that it is rigidly fastened to the frame on the right side while on the left side it is mounted on a trunnion B, Fig. 11, to protect it from strains.

Ignition is obtained by an Eisemann magneto driven from the pump shaft in the case of the Big Six and on the right side on a special gear in the case of the Little Six. On this shaft also is the magneto-type electric generator which provides current for the electric lights. The lighting system consists of a ball-bearing Remy magneto generator and a battery floating on the line. The generator delivers current at a pressure of 12 volts to a 3-wire circuit so that 6-volt lamps are used. The system is designed to carry 68 candlepower of lighting load on the generator at a speed of 8 miles per hour.

Premier cars are made self-starting by means of a compressed-air system consisting of a small pump on the gearset countershaft and a storage tank and lastly a distributor feeding to six ball-check valves, one in each cylinder. On pressure on a valve at the top of the starting switch S1, Fig. 3, in the driver's compartment air is admitted through the distributor to the cylinders in the order of firing so that the pressure forces the pistons down until the motor takes up its regular cycle. The pump is a single cylinder with air-cooling flanges and has a bore of 1⅝ inch and stroke of 2¼ inches. There is an air gauge shown at G in Fig. 3 and a pressure of 50 lbs. is sufficient to turn the motor over for starting.

FIG. 5—PREMIER THREE-QUARTER FLOATING REAR AXLE CONSTRUCTION

The clutch is multiple disk running in oil. It has twenty-one plates, the alternate ones having cork inserts to prevent gripping. These are shown at I in Fig. 7. The plates have four lugs extending from their circumference and on these are attached small coil springs S to facilitate disengagement of the clutch. To make easy the removal of the clutch, the shaft between it and the gearset telescopes when a collar is released.

The three-speed gearset is in an oil-tight aluminum housing which has four arms attaching it to the subframe. The gears are cut from nickel-steel drop forgings and the shafts run upon five annular ball bearings. The entire power plant is mounted upon a subframe of channel form which is bolted to the main frame in such a way that it forms a complete box frame for the forward portion of the chassis. The gearset control, Fig. 9, is mounted immediately over the gearset housing so that the lever is in the center of the driver's compartment as shown in Fig. 3.

Power is delivered from the gearset to the rear axle by shaft equipped with two combination slip and universal joints packed in grease. The universal joints embody a feature of Premier construction at the ends of the propeller shaft. These are tapered squares which fit into tapered square holes in the universal joints in order to do away with keys and key-ways.

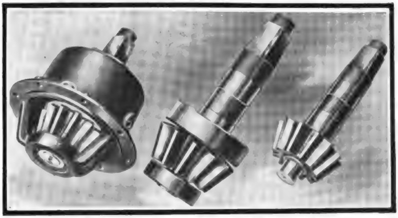


FIG. 8—PREMIER DRIVING PINION AND ASSEMBLY
Showing integral gears and shafts with square tapered ends instead of keyways

The torsion rod is of the V type of tubular construction and the front end is retained in a spring cushion ball joint.

The rear axle is a Premier patent and is what may be called a three-quarter floating type. It has an internally ribbed center housing so that truss rods are dispensed with. The differential is of the bevel gear type and upon it is mounted the main driving gear. Through hand holes in the rear of the housing the gear may be adjusted laterally to take up wear. Correspondingly, the pinion which transmits the rotary motion of the driving shaft to the axle gear is adjustable longitudinally so that with these two adjustments the gear can be made to mesh properly should it be necessary to change their setting. There are eight anti-friction bearings in the rear axle; roller thrust bearings on either side of the differential, annular bearings at the outer end of the axle shaft, and four bearings in connection with the pinion.

At the ends of the axle housings are the brake supports rigidly attached and hot riveted. The brake drums are integral parts of the wheel hubs. The live axle shafts are square at the inner end to fit into the differential and at the outer ends are provided with three clutch jaws forged integral with the shafts themselves. These engage with three corresponding clutch jaws in the hubs of the wheels through which the drive is transmitted. The brake drum is an integral part of this clutch and hub arrangement and the wheel is bolted to it with a bolt through each spoke. An annular ball bearing is placed in the load-carrying center of each wheel.

Braking surface on the Premier car represents a total of 526 square inches and the fact that the brake drums are integral with the wheel hub makes the braking action positive. The internal brakes are operated by a foot pedal and are steel bands covered with raybestos. The emergency brakes are external and are of the same construction. Full adjustment of both brakes can be made by lifting a floor board under the driver's feet, which gives access to a turnbuckle on the brake rod. Additional adjustment is provided by a takeup on the rear end of the rod without removing the brake.

FIG. 9—CENTER GEARSHIFT CONTROL

Semi-elliptic springs are used on the front, each 36 inches long, and three-quarters elliptic on the rear with the bottom section 50 inches long and the top 26 inches in length. The forward ends of the lower leaves of the half springs at the rear, Fig. 10, are longer than the others and are curved under to cushion the blow if the spring strikes the rubber bumper. The front springs in addition to being held by spring clips have drop forged plates binding the leaves at the center. The rear front springs in addition to being held by spring clips have drop forged plates binding the leaves at the center. The rear corners of the channel frame are braced by pressed steel channel sections and small gusset plates. At the front there are integral gusset plates extending down to the radiator supports.

Premier steering gears are unique in one or two respects. In the knuckle design, the load carrying center has been brought close to a center line through the king bolt constituting the steering center. Truss bearings are used in the top of the king bolt to carry the vertical load and the bottom held in hardened and ground bushings. New this year is the ball connection between the tie rod and the steering arm. This is illustrated at A in Fig. 11. The gear is of the irreversible type with a full gear and worm. This gear travels less than one-quarter of its circumference in any one position of adjustment and in case of wear can be shifted one-quarter of a turn. A further adjustment is provided between the worm and the gear by an eccentric bronze bushing.

Notable among the features of the Premier 1913 cars is the clean appearance of the body. Tool boxes, battery boxes and similar equipment being removed from the running board. A mahogany cabinet in the deep cowl of the dash has been provided for carrying tools; the battery is suspended in the front of the car and the spare tire carried at the rear. The bodies are straight line and the door hinges are concealed. The upholstering is unusually deep, the seat springs consisting of a double row of coils, one above the other, with a wire partition between the two.

One of the most commendable features of the equipment is the arrangement for filling the gasoline tank illustrated in Fig. 3. The wheelbase of the Little Six is 132 inches and that of the Big Six is 140 inches.

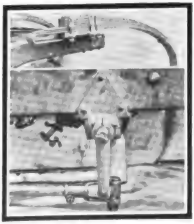


FIG. 10—REAR SPRING ATTACHMENT

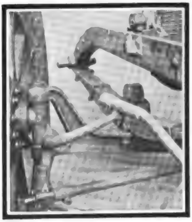
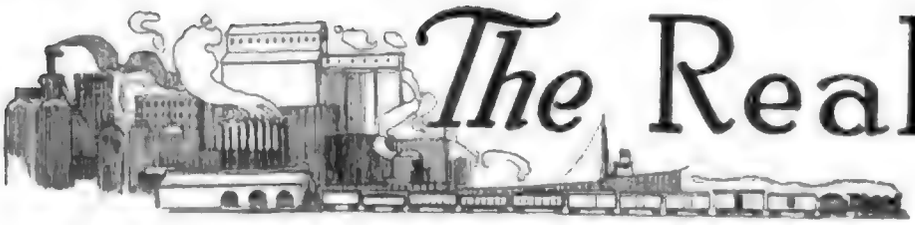


FIG. 11—BALL-JOINTED TIE ROD



The Realm of the

Idle Motor Minutes Mean Lost Miles

No Need Hurrying Horse but With Power Rig Its Different Matter

THE horse demands so many idle minutes per day. With a motor truck idle minutes mean lost miles. There is little need for hurry in using horses for delivery work.

With motor trucks the success of the machine depends directly upon the percentage of running or working minutes during which it operates during the day.

As a general proposition one may say that it costs twice as much to run a motor truck for a day as it does a team of the same capacity. If this be so the motor truck must give twice the service of a horse outfit to be a paying proposition.

The curves plotted in Fig. 1 show the direct relation of idle time to service in both horse and motor systems of delivery, based on a cost per day of $5 for the horses and $10 for the motor wagon. The horizontal line below is marked from 1 to 70, representing the miles of travel possible per day, the vertical distances are marked from 0 to $2, representing the cost per mile. The number of miles done per day determines of course the cost per mile, on the figures taken.

If the horse outfit does 5 miles a day for $5 cost, it takes $1 to pay the hauling cost of every mile, as shown at the upper, X, on the horse plot. If 10 miles a day are made the cost is 50 cents per mile. The maximum is reached with horses at 15 miles per day, bringing the minimum horse cost per mile to about 35 cents. Connecting these points makes the curve ending at maximum.

The other curve represents the motor truck cost. If the machine does but 5 miles a day the cost of hauling is double that of horses or $2 per mile. Doing 10 miles a day the horse is still cheaper. At 15 miles a day the motor is still at a disadvantage, not having begun to make a showing against the horse at the point where horse delivery is at a maximum.

The truck must make 30 miles a day before it will equal the best horse cost of 35 cents per mile. At the same time it must be remembered that the truck at this point is doing twice the mileage or the work of two teams.

The average motor truck which is paying dividends makes around 40 miles per day, which on the table shows a cost of 25 cents per mile. This is a little low, as for distances beyond the 30-mile point extras will begin to work in on the $10 a day flat rate in the shape of tire wear and replacements to bring the daily cost up 2 or 3 cents per mile. The figures given on the plot, as noted before, are for the flat $10 a day rate.

Beyond the 40-mile mark the cost per mile does not decrease so rapidly but approaches a limit at a decreasing rate. The curves show, however, that to do its best work and pay for itself in money saved a motor vehicle must make twice the mileage of a horse rig in the same service.

The somewhat similar curve of Fig. 2 shows the cost per ton as related to the loads carried per day with both horses and trucks on the same cost basis. The 3-ton load is taken as a unit.

Hauling one load a day the horse cost

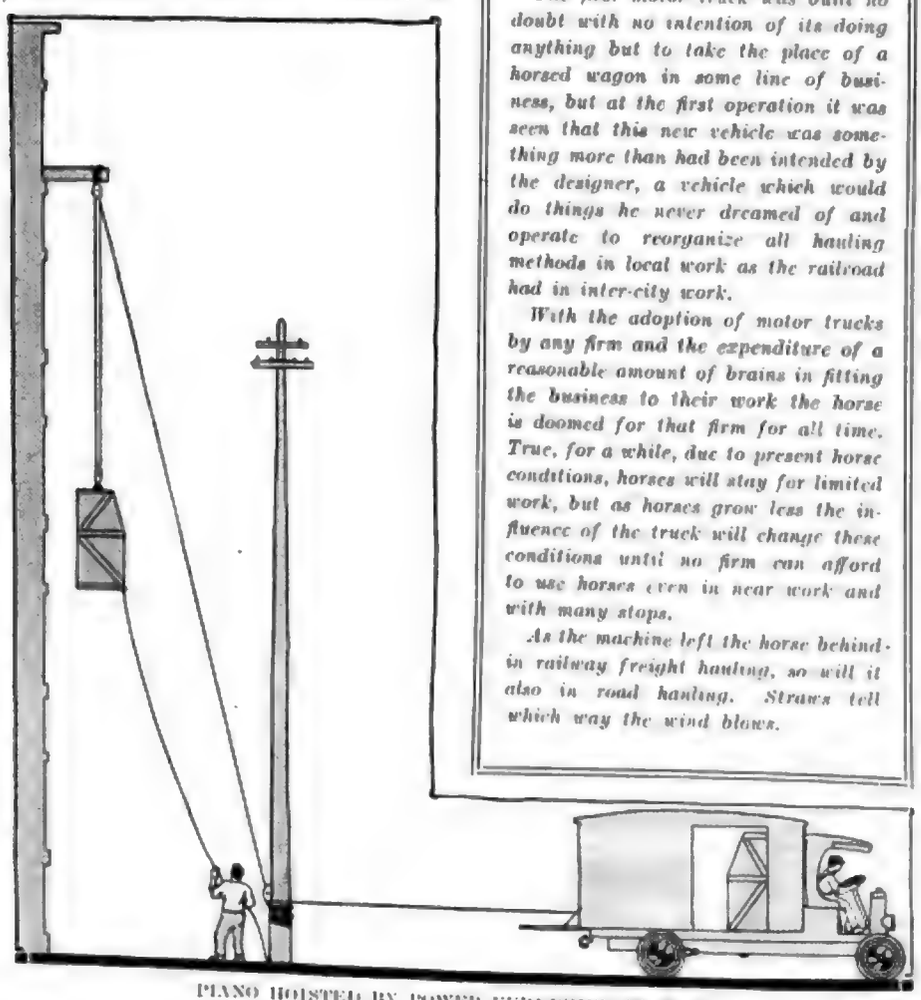
TO be a true prophet is no easy task.

When the first railway was built it was intended primarily for freight, it being by no means the intention of the corporation building it that the line would in any way interfere with passenger traffic by road. The line was to be public and it was the idea that anyone by paying toll might draw his wagons over it as he would over a road. The first operation of the line with steam as the hauling medium, however, put the horse out of business forever so far as railroading is concerned and made the directors almost forget their freight idea in the rush of passenger traffic which came.

The first motor truck was built no doubt with no intention of its doing anything but to take the place of a horsed wagon in some line of business, but at the first operation it was seen that this new vehicle was something more than had been intended by the designer, a vehicle which would do things he never dreamed of and operate to reorganize all hauling methods in local work as the railroad had in inter-city work.

With the adoption of motor trucks by any firm and the expenditure of a reasonable amount of brains in fitting the business to their work the horse is doomed for that firm for all time. True, for a while, due to present horse conditions, horses will stay for limited work, but as horses grow less the influence of the truck will change these conditions until no firm can afford to use horses even in near work and with many stops.

As the machine left the horse behind in railway freight hauling, so will it also in road hauling. Straws tell which way the wind blows.



PIANO HOISTED BY POWER FURNISHED BY TRUCK

Commercial Car

Piano Business Favors the Motor Truck

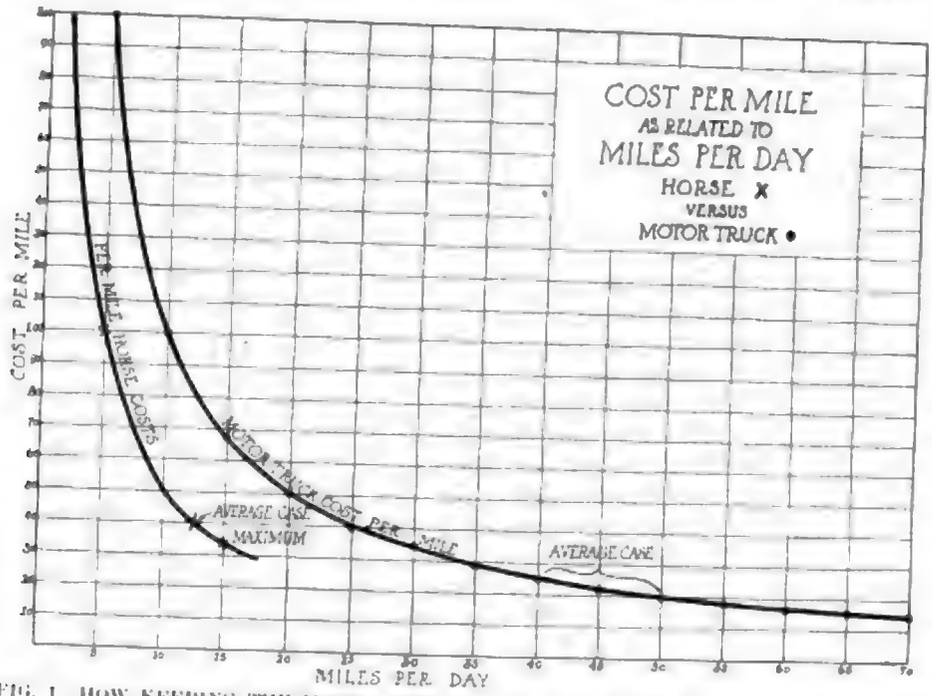


FIG. 1 HOW KEEPING THE MOTOR TRUCK MOVING REDUCES THE COST PER MILE

per ton is $1.67. The motor truck must haul two loads to make this showing, again being required to do twice the work of the horses to pay. The maximum number of horse loads on a 1-mile trip is given as six, making a cost per ton of 83 cents, the limit being imposed by the maximum horse mileage possible.

The truck making twelve loads per day would bring the cost to the same figure, making twice the mileage at the same time, however, so that the truck would in this case be doing the work of four teams. However, on a 1-mile haul such as the horse outfit was credited with, it is doubtful if a motor truck could be made to haul more than six loads, the same as horses, unless special loading and unloading devices were used. The superiority of the truck would be shown more on longer hauls. Suppose the haul were 3 miles. The horse maximum would then be say 3 trips a day or 9 tons. Cost, 56 cents per ton. Loading and unloading time, 20 minutes. The motor truck could make a trip an hour, or nine trips in a day, carrying 27 tons at a cost of but 37 cents per ton. It is on the long haul that motor trucks make the best showing.

At the same time there is here an indication of the cost of waste time at loading and unloading. Suppose it took 1 hour to load and unload the truck; 1 hour and 40 minutes for a trip. But six trips could be made in a 10-hour day, bringing the cost per ton up to 54 cents per ton.

Nearly Every Musical House in Chicago Uses Power Vehicles

PRACTICALLY the entire piano business of Chicago is handled by motor trucks. Motor vehicles in this service are saving the firms using them from $20 to $25 per day. Most of the hauling is done under contract by haulage firms but all find the motor truck much cheaper than the horse. Horses in this work were used originally but 2 days out of 3 with a rest day between, and made around 20 miles a day.

Motor trucks work every day, 8 to 10 hours per day and cover 50 to 75 miles per day. In 1 day's work a machine for Steger Brothers covered over 100 miles. Four men are carried to a truck whether horse or motor, so the saving of the motor truck which will make two or three times the number of deliveries per day with the same quota of men required on a horse rig is apparent. Chicago piano dealers are thoroughly convinced of the practicability and success of motor trucks in piano hauling.

Starting some 7 years ago Lyon & Healy have delivered pianos to date by

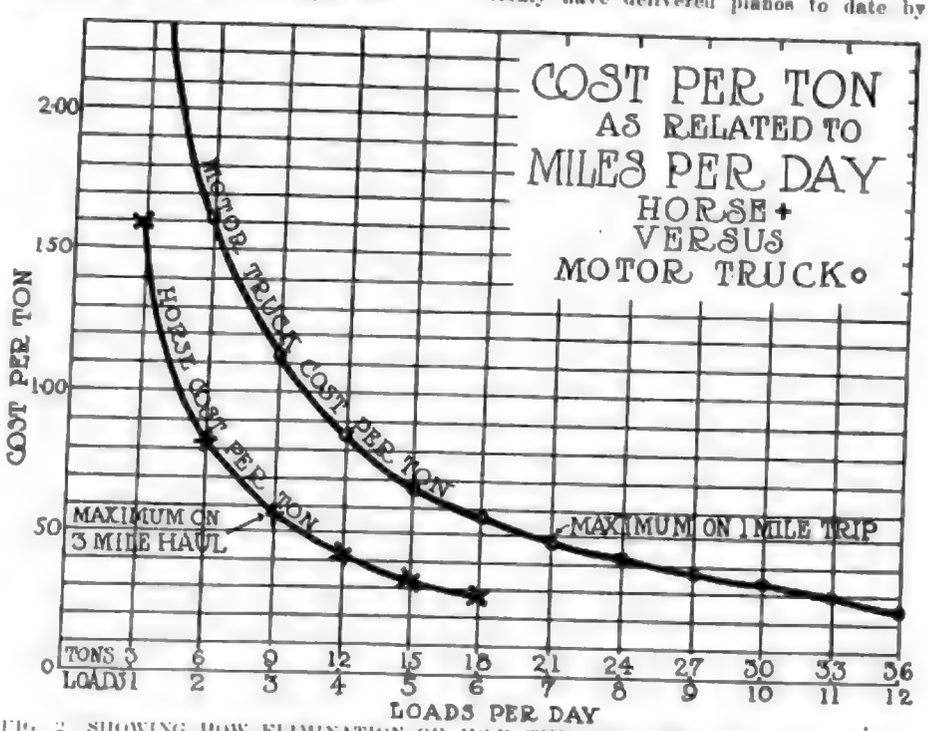


FIG. 2 SHOWING HOW ELIMINATION OF IDLE TIME REDUCES COST PER TON OF MOTOR TRUCK HAULING

STEWART LIGHT DELIVERY

motor truck at a saving of some $25 per day. The Cable Piano Co. also and the Kimball Piano Co. are delivering their own product by motor truck, and with great success. Lyon & Healy have six machines in use in all—three 3-ton trucks, one 2-ton and two 1-ton machines. The 3-ton machines make on an average 50 miles a day with twelve to thirty stops. The smaller trucks make 60 to 70 miles a day with forty to seventy-five stops.

The large trucks are used for the piano hauling and in this branch takes the place of six to eight horses. The cars are fitted with governors to hold the speed down to a 14-mile maximum speed. Piano hauls are ordinarily long and loads heavy so that horses are changed off from day to day. Three horses are used to a wagon, or were with this firm, one horse resting each day and two working.

Four men are taken to a wagon which with horse rigs meant an expense per vehicle of about $15. The motor truck at an expense of $20 per day taking the place of three horse rigs saves as stated before about $25 per day for this one firm. About 8,000 pianos are moved a year. Men on loads are paid $3 per day. Cars run from 7 a. m. to 7 p. m. and are garaged at the company's factory 2 miles out from the downtown store, thus allowing an early start in the morning with a load.

The Cable Piano Co. has three motor trucks in operation, running 40 miles per day and making in that time from twelve to twenty-two stops. The trucks show a saving of at least 50 per cent over horse delivery. Four men go to a truck, the driver at $25 per week and the helpers at $23. Cars make 20 miles per hour speed. Machines are of 2 tons capacity. When horses were used four horses were allowed to a wagon, each team being used on alternate days.

The Kimball Piano Co. uses two 2-ton trucks, making an average of 55 miles per day with twenty to fifty stops. On one occasion 95 miles was covered in a day's work.

Loads are variable and there is no routing in any of the piano work. Four pianos make a load, and as before four men are taken to a truck. The trucks make speeds of between 15 to 20 miles per hour. The two trucks have replaced eight teams. Four horses were originally allowed to every piano wagon, changed every other day, but now all piano hauling is done by motor, and with a resultant saving of 40 per cent. The average haul is 4 miles, but trips are made to West Pullman, Gary, Chicago Heights and South Chicago, a distance of about 15 miles each way, three times a week. The cost of operation is about $21 per day per truck against a former cost of $16 for horse wagons.

RIGHT OR INTAKE SIDE OF STEWART MOTOR

An interesting item in regard to all of these firms is that of tire expense. With the Cable company a tire never has lived up to guarantee, 4,000 miles being the average. The company claims a speed for the truck of 20 miles per hour average. With the Kimball company tires last 5,000 miles to the guarantee, never over that. Speed is given at 14 to 20 miles per hour. Lyon & Healy have no trouble with tires, all of them living up to guarantee and some away over. Their cars are limited in speed by governors to 12 to 14 miles per hour. Is not the reason for tire wear shown in the speed item?

Noting the result of piano hauling by firms purchasing motor trucks, others have taken to the idea. The Steger company, for instance, has a motor truck working which is taking the place of three teams. It averages 50 miles per day and has done 105 miles in a day. Stops are not so frequent being from eight to ten. The truck costs about $20 per day, horse rigs $16.

Going a step further than this is a company recently formed which has taken over the piano delivery work of the bulk of Chicago downtown piano firms and it may be with the eventual intention of handling all of it, as the delivery superintendent of one of the largest music stores implied when talking costs on the motor trucks which they had in use. This firm is using at present six 3-ton trucks operating 10 hours a day. Six pianos are carried to a load, piano weight running from 600 to 800 pounds while a player piano weighs close to 1,000 pounds. Runs of 50 miles per day are usual. Three movers are taken to a truck as well as the driver—four men in all.

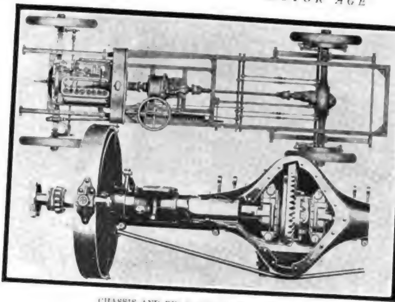
The trucks are handled from a central office near the piano store center of the city, being sent out from here, and the whole system operated by telephones largely. Trucks as a rule are loaded both ways. Nearly 45 per cent of the hauling is in transfer work or in returning rented pianos or the like so that as fast as pianos are unloaded others take their place.

Some of the hauling is done to places where it is impossible to take pianos up stairways. In this case a block and tackle is fixed in position and the piano hoisted up into place, when possible by the power of the motor truck. Instead of the men hoisting on the rope this is hitched to the back of the truck which proceeds down the street, its pull on the rope hoisting the piano while the men below operate the guide ropes. This system is in use by practically all of the Chicago stores using motor trucks.

The following firms are among those served under contract: Julius Bauer & Co., Vose & Co., F. G. Smith Co., Story & Clark Co., Adam Schaaf, Baldwin Piano Co., Chase & Baker Piano Co., Louis B. Malecke, King Piano Co., Vollmer Piano Co.

Not all of these are served by the same contract firm, though most of them have it in the hands of the Star Motor Delivery Co., a newly organized haulage company operating Mack trucks.

One peculiar feature in this work that is noticed by the bystander is the method of changing signs on the trucks to fit the firm for which the particular delivery is being made. These signs are separate and fit in grooved pieces of the body.



CHASSIS AND REAR AXLE OF STEWART TRUCK

STEWART WITH EXPRESS BODY

New Stewart Delivery Car

AMONG the latest of the commercial vehicles is the new Stewart delivery car built by the new Stewart Motor Corporation, Buffalo, N. Y. This new car is four-cylinder, 1500-pound design and is characterized by the simplicity which has marked the cars built by T. R. Lippard and R. G. Stewart. These two men were the organizers of the Lippard-Stewart Motor Car Co., which they recently left to form the new corporation. The Stewart car is built in one chassis model but bodies of six different styles are supplied. The body styles include panel, express, open box, stake platform and undertaker's car. It has been the aim of the designers of the Stewart delivery car to obtain first, simplicity; and second, support of the units so that they are quickly accessible and easily removable in order to reduce the time required in making repairs—a feature of much importance in commercial car operation.

The power plant is of the two-unit design, comprising a Continental motor as one unit and the gearset and clutch as another. The Stewart motor is a four-cylinder monoblock construction with L-head cylinders of 3¾ inches bore and 5¼ inches stroke. The crankshaft is of the three-bearing type and is made of carbon steel, drop forged and heat treated. Bearings are ground to size and are 1¾ inches in diameter. The front bearing is 2¾ inches in length, the middle 3 inches and the rear 4 inches. The connecting rods are I-beam section drop forgings. They are 10½ inches in length with a 2½-inch bearings. The valve cams are integral with the camshaft which runs on nickel babbitt bearings and is lubricated by oil that collects in oil pockets. Removal of the camshaft is permitted by simply removing the gearcase cover. The water-jacket head is cast separately. The inclosed valves are operated on one side of the motor by a single camshaft driven by helical timing gears. Inlet and exhaust valves are interchangeable.

The crankcase is split horizontally, all bearings being carried in the upper half. The lower half contains the oil reservoir and carries a combined oil-filler and breather pipe. A constant-level splash system of lubrication is used and is effected by means of two plunger pumps driven by an eccentric from the camshaft. Water circulation is maintained by a centrifugal pump driven from the camshaft. Circulation of air is obtained by means of blades attached to the periphery of the flywheel which is at the rear of the motor. The radiator shows a departure from common American practice, in that it is placed at the dash, permitting a hood of the sloping European type. Ignition is of the single type by high-tension magneto with fixed spark.

The gearset and clutch case are integral, forming the second unit of the power plant. The clutch is of the dry plate type with five raybestos and six steel plates, 9 inches in diameter. The entire clutch is easily removable by simply removing the front cover and the spicer double universal joints between flywheel and clutch. The gearset provides three forward speeds and is equipped with Timken roller bearings. The gearset and emergency brake levers are mounted directly over the center of the gearset with direct connections to it. The steering column is on the left and the gear is of the worm and gear type. The worm wheel is integral with the shaft. The drive shaft is 1¼ inches in diameter, fitted at each end with two universal joints.

The rear axle is of the floating type, its pressed steel housing shaped like the truss of a bridge. It is equipped with reinforcing sleeves to increase still further its ability as a weight carrying axle for commercial use. The outer ends of the sleeves support the bearings and the wheels. The sleeves go in beyond the spring seats, where the car's weight rests. Timken roller bearings are used both in the differential and in the hubs.

Two sets of brakes—expanding and contracting—are on the rear axle. They are 17 inches in diameter. The gear ratio of the differential is 5 to 1. The frame is generous in size and is of a high carbon steel, heat-treated. It is 4½ inches deep at the point of the greatest stress. A sub-frame is used, on which are mounted the motor and transmission and clutch unit, to assure perfect alignment. Front springs are semi-elliptic, 38 inches in length and the rear springs are the same type 50 inches in length. The front axle is of I-beam type, of Timken construction. All spring bolts, pedal shafts, brake and countershafts are lubricated by means of large grease cups placed on the outside of the frame where they are readily accessible. The wheelbase of the chassis is 126 inches and the wheels are equipped with 34 by 4-inch pneumatic tires in front and 35 by 4½ in the rear.

STARTS MOTOR TRUCKING BUSINESS

The Heavy Tonnage Transportations Co., of Toledo, a new concern recently incorporated under the laws of Ohio with a capital stock of $150,000 has begun business in the rapid transit of merchandize in and out of the city by means of motor trucks owned and operated by the company. Several heavy motor trucks already are in operation and it is expected to put into operation fifteen heavy tonnage motor trucks of from 3 to 8 tons capacity. This company has taken over the Parsons garage, corner Jefferson avenue and Michigan street. Beside the heavy transit business the concern will conduct a general garage and repair business. The office of the company will be located in the Meredith building. The company is now doing business for brick and cement concerns.

From the Four Winds

PULLMAN PACKARD DESIGNED FOR TOURING PURPOSES

MASON'S Fuel Consumption—In the Elgin road races the two competing Masons are reported to have averaged 14 miles to the gallon of gasoline and thirty-seven miles to a gallon of oil. They ran in the Jencks, Aurora and Elgin cup events.

Ontario Posts 1,000 Signs—Through activity of the Ontario Motor League more than 1,000 signs have been placed in the province of Ontario. These roads have been fixed up with signs: Toronto to Port Hope, Toronto to Jackson's Point, Toronto to Guelph, Toronto to St. Catharine's, via Hamilton; Guelph to Hamilton, via Galt.

Big Load for Abbott—One of the most wonderful stunts ever performed by a motor car is reported from Byers, Texas, when a 30-horsepower Abbott-Detroit pulled three heavy farm wagons, a surrey and two buggies linked together. In the vehicles were seventy-eight persons, twenty of the number being children. The total weight pulled by the car was nearly 14,000 pounds. The car was driven by Dr. A. T. Reed, a prominent physician of that city.

Motor Cars in South Africa—According to a report from the American consul at Port Elizabeth, the financial condition in South Africa at the present time is favorable for increased trade. A year ago public sentiment was averse to the motor car, it being declared that the country was not suited to such a vehicle, particularly in the country. Now the motor car is common in the country and traveling men are making use of the car in traversing through the districts. Roads are being improved, which, with a prosperous condition among the farmers, should increase the sales to a great extent. Cars with good clearance are the most desirable. The demand is for medium and low-priced touring cars, and runabouts of 15 to 20 horsepower. The trade demands a solidly-constructed car, one suited for rough roads. An increase of $194,733 in 1911 over 1910 imports indicates the trend of the motor car in South Africa.

Dallas' Car List Growing—The four thousandth motor car license to be issued from Dallas will be given out this week. This ranks Dallas as the leading motor city in the state, and gives over a thousand licenses more than any other city in the state of Texas.

British Columbia Registrations—Figures supplied by the provincial police, who handle motor licenses for the province, show that 3,568 machines have been registered in British Columbia. Of these it is estimated that about 1,800, or a little more than half, are issued from the Vancouver office, covering the city of Vancouver, New Westminster, North and South Vancouver and all the adjoining municipalities.

Motor Poker the Latest—Motor poker is the latest fad in Buffalo, N. Y. Recently two enthusiastic motorists played the game while traveling in a touring car from Lockport to Buffalo. The motorists in question took position on a highway frequently traversed by cars. The players drew for position; that is, one of the men arranged that his friend should select the first car that came along. The men bet 10 cents on the numbers carried by each car. If the car was numbered 59,444 that signified three four-spots; if 12,345 that was a straight; if 10,000 that would be four aces, each cipher standing for an ace and so on, the numbers on the passing cars to decide who won the 10 cents at stake. How closely contested was Buffalo's first game of motor poker may be realized when it is stated that, although 441 cars were passed during the game, only 80 cents was lost by one motorist.

Iowa's Car Census—According to the latest reports from the office of the secretary of state of Iowa, there are now 38,924 cars in that state. There are 1,480 licensed dealers and 3,890 motor cycle owners have registered. During the present year up to August 31, $45,657.81 has been paid into the state treasury for motor registrations; $14,851.29 was paid in August.

New York Collects a Million—According to statistics just made public by Secretary of State Lazansky, the New York tax levied on chauffeurs and motor vehicles for the fiscal year ending on September 30 will total $1,000,000. The greatest gain in any one year in the tax receipts was last year, owing to introduction of motor trucks into business, but last year's figures will be surpassed by this year's tax.

City and County at War—The city of Des Moines and Polk county, Iowa, are at war over the manner in which the motor tax funds shall be spent. The county claims the funds thus derived must be spent on the city streets which lead to the main highways of the county, while the city officers dispute this. Ralph Bolton, representing the taxpayers, has brought an injunction against the city to show that the county officials are right.

Pullman Packard the Latest—Luxury in motor travel, together with independence from hotels, has been achieved by U. H. Dandurand, of Montreal, in a Pullman Packard. On a 3-ton Packard truck chassis has been mounted a body whose interior arrangement is similar to that of a private railroad car. Twenty-five persons are easily carried on short trips and for long journeys there are accommodations for the comfort of eleven, including chauffeur and cook. The body is 25 feet, 3 inches over all; 6 feet, 6 inches wide; 9 feet, 6 inches, outside height; 6 feet, 6 inches, inside height. The compartments consist of a stateroom for the driver in front; a women's stateroom with sleeping room for five; a men's stateroom with quarters for four. This section is also the dining and smoking room, with two extension tables and a folding desk. In the rear is a kitchenette, compact and complete from stove to refrigerator. There is a telephone system with four instruments, placing every compartment in touch with the driver. The interior finish is mahogany; the drapings of green silk and plush with gold lace trimmings, with carpets to match. The lighting system consists of a dynamo with two accumulators having a capacity of 160 amperes. The front of the car has six lights, two electric, two gas and two oil;

the rear has a red tail light, an electric dome light and two railway signal lights. Under the body floor are five lockers containing planks to reinforce weak bridges, blocks and tackle, and an entire touring emergency outfit. The body was built by P. Brault, Montreal.

PRIVATE GARAGE ERECTED AT FINDLAY, O.

Now for Southern Motoring—September 1 marked the opening of the real touring season in New Orleans and Louisiana. While motoring as a pleasure continues the year round here, it is more animated from September 1 to May 1, due to the increased number of cars, as many of the northerners who winter in the south have their cars with them. As there generally is much less rain in the fall than at any other season, roads are in better condition and out-of-town trips are more popular.

Berry-Carrying Car—An accompanying illustration gives some idea of how the ordinary touring car may be converted into a very useful truck for carrying light loads such as fruit, etc. The owner of the car, L. A. McClintock, of White Salmon, Wash., had a 16-acre tract of strawberries and during berry season the berries had to be hauled as soon as possible after they were picked to the station, 3½ miles away. This called for a swift but jarless means of transportation. His 40-horsepower Velie solved the problem. By loosening six bolts and a few screws his brother figured out how he could remove the body and substitute it with one more suitable for hauling berries. By so doing he saw that he could drive the car in place of old Dobbin to the station with the berries. The body, which was somewhat crude, though substantial, was made of soft wood at a cost of about $10, the bed of it being 5 by 5½ feet. The car was thus converted into a very serviceable truck and hauled loads up to 2,000 pounds. The illustration shows a load of forty-eight crates each weighing 30 pounds or better than 1,500 pounds in all, and the machine hauled this easily up grade or down. After the berry season the machine took its touring car form again and the truck body laid aside till the next occasion when the machine can be used to a better advantage as a truck than a touring car.

VELIE THAT IS USED FOR BOTH BUSINESS AND PLEASURE

Model Garage in Findlay—One of the prettiest garages ever constructed in Findlay, O., is that just completed by Mrs. E. Wannamaker. The roomy little building holds a Chalmers 36 and Waverley coupe. The building cost something less than $2,000.

Tampico's Progress—In July of 1911 there was not a single motor car in Tampico, Mexico. Today there are seventy-five and a movement for better roads and streets is accomplishing great results, which will mean a rapid increase in the number of cars in the Mexican port, according to the American consul, Clarence A. Miller. Most of the machines now in use in Tampico are second-hand cars which have been shipped from the United States and Mexico City, but with the street and road improvements and due to the general prosperity arising from the development of oil fields in the vicinity of the town, Consul Miller thinks a good market is offered for light cars.

Mississippi Profiting—Slightly in excess of $27,000 has flowed into the coffers of the state of Mississippi due to the recent state tax on motor cars. State Auditor Thompson reports that an additional $10,000 likely will be collected if the law withstands the tests now being made by the suits brought in the supreme court.

Now Roads Are Wanted—Since the advent of the motor car in Colombia there has been a decided increase in the demand for better streets and roads. The American consul at Barranquilla, Isaac A. Manning, is of the opinion that American car manufacturers could do well by submitting prices to dealers at his post. As Puerto Colombia and Cartagena soon are to be connected with Baranquilla by model highways, the consul suggests that the present time is very propitious for the advertising of American motor cars.

Road Work in Nebraska—A meeting of the directors of the Platte Valley Transcontinental route was held in Columbus, Neb., last week, the representatives of fifteen counties being present. It was decided to establish a correspondence bureau, to keep each section in hand. The directors will report monthly to Secretary B. D. Parker, at Julesburg, Colo., the condition of the road in their counties, whether there are any bad spots, and, if so, what is being done to repair them. Each representative will make an effort to enlist county, town and individual aid in improving the road. That part of the highway west of Columbus which was one of the worst places on the route 3 months ago, has been rebuilt into a gumbo sand road which has been approved.

Current Motor Patents

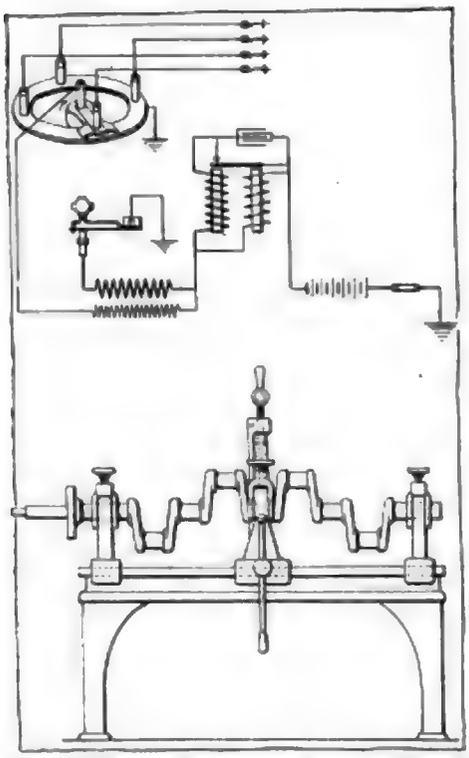


FIG. 1—DELCO IGNITION SYSTEM AND PAINE SHAFT STRAIGHTENER

PATENTS ISSUED SEPTEMBER 3, 1912

1,037,187—Vulcanizing Mold. Alexander Adamson, Akron, Ohio. Filed October 9, 1911. Serial No. 653,068.

1,037,203—Locking Device for Motor Cars. John Bystrom, Chicago, Ill., assignor to John Howard McElroy, Chicago, Ill. Filed December 28, 1911. Serial No. 668,386.

1,037,211—Connecting Rod Coupling. Albert De Dion and Georges Bouton, Puteaux, France. Filed October 6, 1909. Serial No. 521,323.

1,037,222—Traction Engine. William Durran, Percy township, Ontario, Canada. Filed August 14, 1911. Serial No. 643,959.

1,037,229—Resilient Mounting for Wheels. William Lee Foster and George H. Foster, Kansas City, Mo. Filed January 18, 1911. Serial No. 603,770.

1,037,239—Lubricator for Explosion Engines. Earle W. Goodnow, Lansing, Mich., assignor to the New-Way Motor Co., Lansing, Mich. Filed December 6, 1911. Serial No. 664,168.

1,037,250—Process for Making Cores for Manufacturing Tire Shoes. Robert M. Hinman, Akron, Ohio, assignor of one-half to Frank Nolte, Akron, Ohio. Original application filed December 1, 1909. Serial No. 530,876. Divided and this application filed October 30, 1911. Serial No. 657,520.

1,037,301—Shaft Straightening Machine. Timothy J. Paine, deceased, Watertown, Mass., by Julia A. Paine, administratrix, Watertown, Mass. Filed April 10, 1912. Serial No. 691,211.

1,037,307—Spark Plug. Anthony S. Pierrel, Washington, La. Filed August 10, 1911. Serial No. 643,426.

1,037,311—Elastic Tire. Philip W. Pratt, Boston, Mass. Filed June 11, 1910. Serial No. 566,331.

1,037,312—Motor Truck. John Q. Primm, Lincoln, Ill. Filed September 28, 1911. Serial No. 651,880.

1,037,336—Support for Motor Cars. Charles W. Schubert, Cottonwood, Iowa. Filed November 4, 1911. Serial No. 658,608.

1,037,351—Alarm for Motor Cars, Etc. Anthony Sou, Boston, Mass., assignor, by direct and mesne assignments, to Payne Mfg. Co., Boston, Mass., a corporation of Massachusetts. Filed February 17, 1911. Serial No. 609,185.

1,037,354—Steering Wheel Device. Arnold M. Squire, Cleveland, Ohio. Filed August 29, 1911. Serial No. 646,691.

1,037,360—Pneumatic Support for Vehicles. Charles J. Stovel, San Francisco, Cal. Filed January 22, 1912. Serial No. 672,617.

1,037,376—Starter for Internal Combustion Engines. Bernhard Volkmar, New York, N. Y., assignor to Volkmar Auto Starter Co., a corporation of New York. Filed June 17, 1910. Serial No. 567,388.

1,037,378—Cut-out for Mufflers. George C. Ward, St. Louis, Mo. Filed April 25, 1910. Serial No. 557,391.

1,037,383—Lubricating device. Otto H. L. Wernicke, Grand Rapids, Mich. Filed February 12, 1912. Serial No. 677,067.

1,037,386—Illuminated License Number and Signal for Vehicles. Holland R. Wildman, York, Nebr. Filed April 1, 1912. Serial No. 687,927.

1,037,394—Hood for Motor Cars. Clarence S. Wood, Detroit, Mich., assignor to Briscoe Mfg. Co., Detroit, Mich., a corporation of Michigan. Filed June 4, 1909. Serial No. 500,185.

1,037,395—Motor Car Hood. Clarence S. Wood, Detroit, Mich., assignor to Briscoe Mfg. Co., Detroit, Mich., a corporation of Michigan. Filed October 16, 1909. Serial No. 523,035.

1,037,400—Internal Combustion Engine. Albert E. Youngren, Kewanee, Ill. Filed April 11, 1911. Serial No. 620,423.

1,037,401—Timer for Explosion Engines. Albert E. Youngren, Kewanee, Ill. Filed April 11, 1911. Serial No. 620,424.

1,037,404—Shock Absorber. Arsene Zeppelin, Brookline, Mass. Filed November 17, 1911. Serial No. 660,879.

1,037,412—Tire. Harry O. Bartlett, Caldwell, Ohio. Filed October 16, 1911. Serial No. 654,893.

1,037,414—Tire Fastening Device. William Leopold Bauer, Covington, Ky. Filed June 12, 1911. Serial No. 632,608.

1,037,427—Universal Joint. George H. Brush, Chicago Heights, Ill., assignor of one-third to Wesley G. Nichols, Chicago Heights, Ill. Filed April 18, 1911. Serial No. 621,926.

1,037,437—Internal Combustion Engine. Aurin M. Chase, Syracuse, N. Y. Filed September 29, 1910. Serial No. 584,398.

1,037,446—Metallic Resilient Wheel. Thomas H. Coulter, Cleveland, Ohio, assignor of one-half to John T. Schleifenheimer. Filed August 7, 1911. Serial No. 642,686.

1,037,462—Governor-Controlled Igniter. Joseph Fleischmann and Philip Wolf, Marshfield, Wis. Filed April 28, 1911. Serial No. 623,818.

1,037,469—Starter for Explosion Engines and Self-Propelled Vehicles. Delamere B. Gardner, Chicago, Ill. Filed December 4, 1909. Serial No. 531,293.

1,037,477—Motor Vehicle Spring. Allen E. Hall, Merion, Pa. Filed June 28, 1911. Serial No. 635,708.

1,037,478—Internal Combustion Engine. Edgar O. Hayes, Milwaukee, Wis. Filed September 30, 1910. Serial No. 584,609.

1,037,482—Tire Case. Charles F. Hopewell, Newton, Mass. Filed June 21, 1912. Serial No. 704,947.

1,037,485—Electrical Appliance for Gas Engines. John W. Jepson, Depew, N. Y., assignor by mesne assignment, to Gould Coupler Co., a corporation of New York. Filed March 29, 1910. Serial No. 552,191.

1,037,491—Ignition Apparatus for Explosion Motors. Charles F. Kettering, Dayton, Ohio, assignor to the Dayton Engineering Laboratories Co., a corporation of Ohio. Filed September 15, 1909. Serial No. 517,188.

1,037,492—Ignition System. Charles F. Kettering, Dayton, Ohio, assignor to the Dayton Engineering Laboratories Co., a corporation of Ohio. Filed November 2, 1910. Serial No. 590,406.

1,037,510—Split Roller Bearing. John Newmann, Brooklyn, N. Y. Filed September 11, 1911. Serial No. 648,767.

1,037,526—Explosive Engine. Henry J. Podlesak, Chicago, Ill. Filed December 7, 1910. Serial No. 596,062.

1,037,574—Spring Wheel. Dorr Amerman, near Longmont, Colo. Filed September 3, 1910. Serial No. 580,289.

1,037,583—Shock Absorber. Joseph Benny, Newark, N. J. Filed June 25, 1912. Serial No. 705,730.

1,037,593—Antirattler for Motor Car Doors, Etc. Franklin Cole, Pontiac, Mich. Filed December 7, 1911. Serial No. 664,332.

1,037,601—Means for Locking Motor Car Starting Cranks. William J. N. Davis, Chicago, Ill. Filed October 14, 1910. Serial No. 587,007.

1,037,602—Spring Wheel. Progor De Bogory, Cocoanut Grove, Fla. Filed January 26, 1911. Serial No. 604,898.

1,037,604—Wind Shield. Harry A. Douglas, Chicago, Ill., assignor to the Adams & Westlake Co., a corporation of Illinois. Filed November 22, 1909. Serial No. 529,318.

1,037,605—Internal Combustion Engine. John H. Eaton, Rochester, N. Y., assignor of one-third to James F. Eaton, Rochester, N. Y. Filed April 29, 1908. Serial No. 429,835.

1,037,610—Automatic Vehicle Jack. Clyde N. Friz, Baltimore, Md. Filed March 13, 1912. Serial No. 683,561.

1,037,622—Starting Device for Gas Engine. Richard C. Hiller and David W. Wade, Cleveland, Ohio. Filed December 21, 1910. Serial No. 598,571.

1,037,642—Resilient Tire. Charles John Koopman, Middletown, Cal. Filed March 9, 1909. Serial No. 482,294.

1,037,653—Starting Device for Internal Combustion Engines. Raymond H. Muntz, Greenville, Pa., assignor to Geizzler Starting Device Co., New York, N. Y. Filed September 13, 1910. Serial No. 581,855.

1,037,663—Starting Device for Engines. James O. Roberts and John W. Nunn, Granger, Tex. Filed August 21, 1911. Serial No. 645,140.

1,037,667—Explosive Engine. William Alexander Schaffer, Waco, Tex., assignor of one-fourth to John L. Orand, Waco, Tex. Filed September 27, 1910. Serial No. 584,027.

1,037,677—Tire Armor. John Robert Smith, Flagstaff, Ariz. Filed December 7, 1911. Serial No. 664,354.

1,037,686—Tire. Thomas Toomey, Scranton, Pa. Filed March 28, 1911. Serial No. 617,395.

1,037,699—Wheel. John F. Wilmot, Detroit, Mich. Filed February 4, 1909. Serial No. 475,986.

1,037,718—Transmission Gearing. Frank A. Babcock, Syracuse, N. Y., assignor of one-half

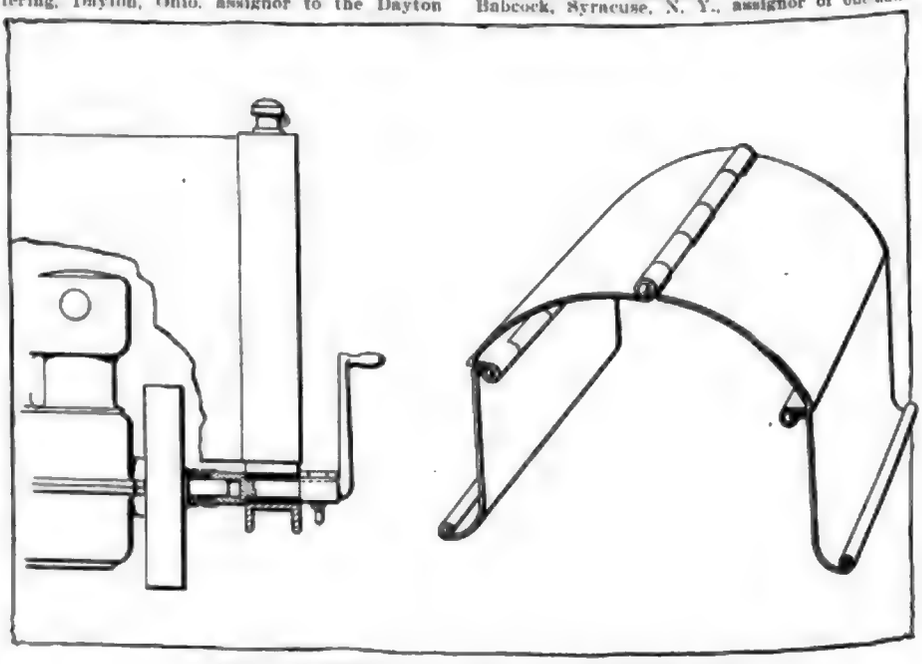


FIG. 2—DAVIS CRANK LOCK AND BRISCOE HOOD

Inventions of the Week

to John E. Maloney, Syracuse, N. Y. Filed September 9, 1911. Serial No. 648,450.

1,037,730—Road Vehicle Suspension Arrangement. Leonard Eugene Cowey, Kew Gardens, England. Filed February 6, 1909. Serial No. 476,551.

1,037,753—Vehicle Wheel Tire. John A. Gerhart, Marietta, Ohio. Filed October 12, 1911. Serial No. 654,382.

1,037,754—Cooler. Raleigh C. Gildersleeve, New York, N. Y., assignor to El Arco Radiator Co., New York, N. Y., a corporation of New York. Filed March 27, 1909. Serial No. 486,065.

1,037,808 — Planetary Gearing. Kenneth Trowbridge, Atlanta, Ga. Filed August 5, 1910. Serial No. 575,681.

1,037,814—Hub Cap. Francis Whitney, Hopkinton, N. Y. Filed March 29, 1911. Serial No. 617,729.

1,037,816—Pilot Lamp Operating Mechanism. Wilford E. Anderson, Emmett, Idaho. Filed October 21, 1911. Serial No. 656,059.

1,037,828—Spark Timing Device. Leland F. Goodspeed, Wilkinsburg, Pa. Filed March 2, 1908. Serial No. 418,731.

1,037,829—Tire for Vehicle Wheels. Clarence B. Howe, Utica, N. Y., assignor of one-half to James H. Goodier, Utica, N. Y. Filed July 5, 1910. Serial No. 570,288.

1,037,833—Automatic Regulation for Carbureters. Edward P. Noyes, Winchester, Mass. Filed October 12, 1911. Serial No. 654,239.

1,037,834—Carbureter. John W. Raymond, Dayton, Ohio, assignor to the Air Friction Carbureter Co., Dayton, Ohio, a corporation of Ohio. Filed October 9, 1911. Serial No. 653,667.

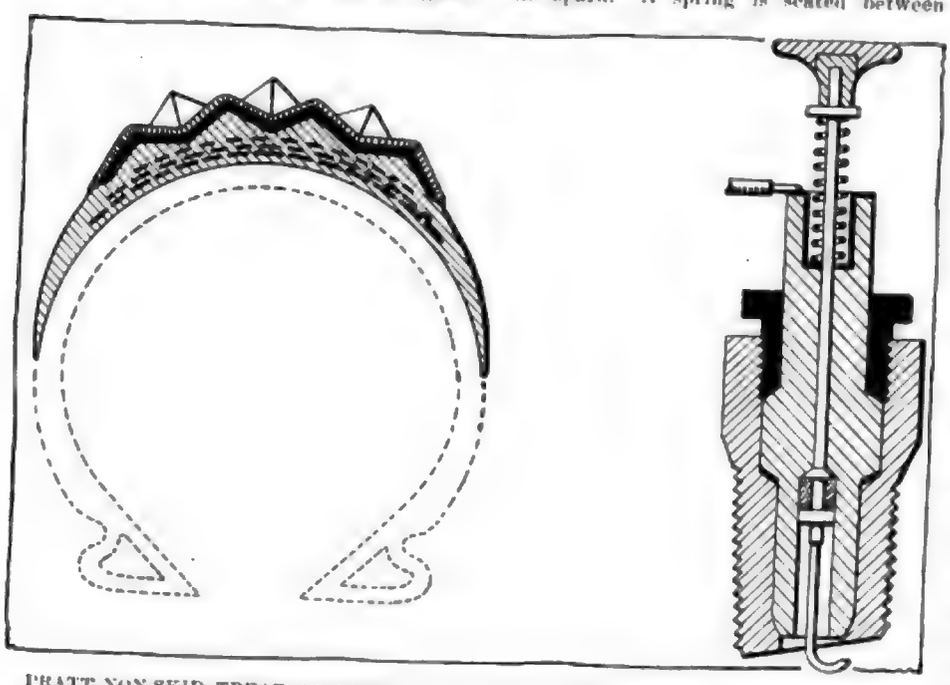
PATENT DESIGNS

42,971—Motor Car Horn. Ray H. Manson, Elyria, Ohio, assignor to the Dean Electric Co., Elyria, Ohio, a corporation of Ohio. Filed March 2, 1911. Serial No. 681,278. Term of patent, 7 years.

42,972—Motor Car Horn. Ray H. Manson, Elyria, Ohio, assignor to the Dean Electric Co., Elyria, Ohio, a corporation of Ohio. Filed April 22, 1912. Serial No. 692,504. Term of patent, 7 years.

LOCK for Motor Car Cranks—No. 1,037,601, to William J. N. Davis, Chicago. Filed Oct. 14, 1910, dated Sept. 3, 1912. With a view to making the theft of a motor car impossible, the design covered by this patent consists of a means of so locking the starting crank of a motor car, that it cannot be used to start the engine. This is accomplished by means of a sleeve which is placed between the shaft and the motor of the starting crankshaft so as to make engagement of the ratchet impossible by preventing the longitudinal movement of the crank. This sleeve is made in two sections, which are locked in position by means of two perforated lugs, through which a padlock is linked. This device would make cranking of the car impossible but would not prevent starting on the spark, nor the theft of the vehicle by towing.

Adjustable-Gap Spark-Plug—No. 1,037,307; to Anthony S. Pierul, Washington, La. Filed Aug. 10, 1911, dated Sept. 3, 1912. This spark plug consists of a steel shell, screwed into the cylinder, with an oblique inside surface. Within this is an insulating element and a retaining ring. Within the insulating element is a core, having a curved electrode extending below the bottom or inside of the plug. This core can be turned or moved up and down, having a guide-collar within a counterbore in the lower portion of the insulating element, and a thumb button at its top. This thumb button, when turned alters the length of the spark gap, because of the angle of the lower face of the spark plug shell, so that by this means, it may be adjusted for a very small gap, or turned away until the gap is greater than the spark will jump. The reciprocating movement is for the purpose of temporarily cutting out one plug by increasing the length of the gap beyond the maximum length of the spark. A spring is seated between the plug body and the thumb nut, to hold the electrode normally in sparking position.



PRATT NON-SKID TREAD AT RIGHT AND PIERUL ADJUSTABLE GAP PLUG AT LEFT

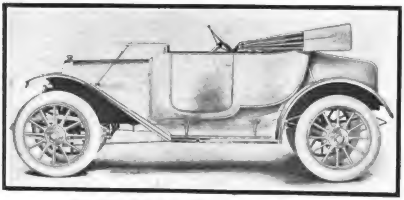
Machine for Straightening Bent Shafts—No. 1,037,301; to Timothy J. Paine, deceased, Watertown, Mass., by Julia A. Paine, administratrix, Watertown, Mass. Filed April 16, 1912, dated Sept. 3, 1912. This device consists of a bed, upon which a central member may slide, and two stationary supports at either end. These supports are provided with V-shaped grooves in their top surfaces, and clamps, for the purpose of clamping cylindrical shafts across them. The central member, also provided with grooved seats, may be locked in any position with relation to the stationary supports, to be clamped to any portion of the shaft. So clamped, the shaft supporting portion may be raised or lowered by means of a screw and nut mechanism, by which any portion of the shaft that is out of true may be bent to its proper shape.

Delco Ignition System—No. 1,037,492; to Charles F. Kettering, Dayton, Ohio, assignor to The Dayton Engineering Laboratories Co., Dayton, Ohio. Filed Nov. 2, 1910, dated Sept. 3, 1912. This system is of the usual high-tension type, differing from standard in that the circuit is normally grounded through a permanently grounded magnetic switch, whose contact with the sparking circuit is broken simultaneously with the making of the contact with each of the spark plug circuits, by the high-tension distributor. The balance of the system comprises a battery, induction coil, vibrator, and condenser, with an auxiliary coil in conjunction with the grounding switch, for the purpose described above.

Brisco Motor Car Hood—No. 1,037,395; to Clarence S. Wood, Detroit, Mich., Assignor to Briscoe Mfg. Co., Detroit, Mich. Filed Oct. 16, 1909, dated Sept. 3, 1912. This patent refers to an improved hinge construction for the usual form of motor car hood. The hinge, which is of the ordinary piano type, is disposed within the hood, invisible externally, producing a neater appearance than an exposed hinge. A more practical advantage of this type of construction, is that the inward extensions of the hinged portions, extending at right angles to these portions, prevent the spreading of the hood parts, keeping the hood snugly against the flanges on the dash and radiator, when in position.

Non-Skid Tire Tread—No. 1,037,311; to Phillip W. Pratt, Boston, Mass. Filed June 11, 1910, dated Sept. 3, 1912. Similar to numerous other non-skid rubber tire treads this form of construction differs in the shape of the raised portions of the tread. These projections are in the form of diamond-shaped pyramids, built up on top of a tread, which with the additional material in the spikes worn off, would still be substantially as thick as a smooth tread tire. The fabric backing extends into the corrugations.

Among the Makers and Dealers



WAVERLEY ELECTRIC SHELTERED ROADSTER, MODEL 90

JOIN Abbott Forces—W. N. Eyster has been appointed service manager of the Abbott Motor Co., of Detroit, with W. A. Reichert as his assistant.

Many Going in St. Louis Show—There are in St. Louis eighty-three motor car manufacturers and dealers and all but two of these will have exhibits at the outdoor show which will be held there at one of the summer gardens, the week of October 7.

Adopts 9-Hour Day—The Aluminum Castings Co.'s two plants in Buffalo, commencing on October 1, will put its entire business on a 9-hour basis. The original intention of the concern, according to Manager Adams, was to put the 9-hour day into effect on May 1, but the strike of the molders and coremakers in the plants prevented this. The company will continue to maintain a strictly open shop.

Tennant Returns to Chicago—W. G. Tennant, well known as head of the Peerless Motor Car Co. of New York city, has resigned. Mr. Tennant's resignation was tendered that he might assume active management of the Tennant Motor Limited, 2447 Michigan avenue, Chicago, distributor of Henderson motor cars. He will be associated with his brothers, J. G. and J. W. R. Tennant.

Atlanta's Show Prospects—At a recent meeting of the Atlanta Automobile and Accessory Association 19,850 square feet of floor space in the Atlanta Automobile show of November 16-23 was engaged and checks for 25 per cent of the amount due were paid in. This means that more space has already been subscribed for than was used last year and that the financial success of the show is assured. The cars which will be shown in the space already subscribed are R. C. H., Locomobile, Cadillac, Premier, Cole, Pope, Velie, Case, Studebaker, Michigan, Marmon, Hudson, Ford, Mitchell, Oakland, Stevens-Duryea, Pierce-Arrow, Apperson, Stearns, Overland, Packard, Firestone-Columbus, Dorris and others.

Car Given Clarkson—The Society of Automobile Engineers has united in formally presenting Secretary and General Manager Coker F. Clarkson of the society with a new 1913 Hudson car. The gift is an appreciation of Mr. Clarkson's efficient service in furthering the cause of standardization in motor car engineering.

Making Good Road to Speedway—In keeping with a promise made the company some time ago, the city of Indianapolis is improving the Crawfordsville road from Indiana avenue to the Emrichsville bridge across Fall Creek, in order to provide a passable highway for the Prest-O-Lite Co. on the way to the company's new plant near the Indianapolis motor speedway. The new plant, nearing completion, will cost approximately $350,000. The city council has appropriated $10,000 and the board of park commissioners $5,000 for building the new road. The Indianapolis and Milwaukee plants and the plant of the Esterline Co., now at Lafayette, are to be combined in the new plant near Speedway.

NEW STEARNS-KNIGHT RADIATOR CAP

Weston-Mott Invades Foreign Field—The Weston-Mott Co. of Flint, Mich., manufacturer of axles, hubs and rims, has established a branch at 136 Longacre, London, W. C., Eng., and the building of a large export trade will be pushed with vigor.

Willman Promoted—G. L. Willman has been promoted to the office of sales manager for the Warren Motor Car Co., Detroit. Mr. Willman succeeds George D. Wilson, the latter having gone to New York city as the eastern representative of the Warren company.

Adding to Plant—The Detroit Pressed Steel Co. will soon commence operations on an addition to its plant, which is to be one story in height and measure 100 by 200 feet. The increased factory space will allow the concern to triple its output, which is said to be necessary, due to the rapidly increasing business.

Harris Oil Co. Changes—Announcement has been made of the incorporation of the A. W. Harris Oil Co., of Providence, R. I. The new corporation will succeed the A. W. Harris Oil Co., which was formerly conducted by the late A. Walter Harris. The incorporators of the new company are Benjamin S. Terry, president; Arthur D. Greene, treasurer, and George F. Heywood, secretary. The capital stock is $75,000. The company is incorporated under the laws of Rhode Island.

Croxton Plant Nearly Ready—The new plant of the Croxton Automobile Co., at Washington, Pa., is almost ready for occupancy. The main building of the new works is 120 by 500 feet, being a three-bay building, each bay being 40 feet wide. It is of steel frame and brick construction and required about 500 tons of structural steel to erect. The foundations and floors are of concrete. As much glass as possible has been used in the sides of the building. The former plant of the company was in Cleveland, O., and these works have been practically dismantled now. Last week six carloads of machinery were shipped to the new plant. The company has been making taxicabs, touring cars and trucks and has built up a large business. Washington and Pittsburgh capitalists are interested in the new venture. The company is capitalized at $300,000. About $40,000 was expended in the erection of the new plant. With the new machinery, to be used in addition to that shipped from Cleveland, the company will be able to manufacture 1,000 cars annually. All the machinery is to be mo-

tor-driven, the power to be furnished by the West Penn Light and Power Co. J. P. Stoltz, of Cleveland, will retain the presidency of the concern.

Hayden Joins Nyberg—The Nyberg Automobile Works has added another to its list of agents, John W. Hayden, who will act as special agent for the Nyberg motor cars in Chicago and immediate vicinity. Mr. Hayden until recently had been manager of the United Motor Indianapolis branch.

Packard Men at Pierce Factory—One hundred and fifty Packard dealers from the Packard factories at Detroit, Mich., inspected every department of the Pierce-Arrow Motor Car Co. in Buffalo. The visitors went to the plant in five sight-seeing motor buses which they boarded at the Buffalo dock whence they came on a lake steamer from Detroit, where they recently concluded their annual convention. After inspecting the Pierce-Arrow plant, the Packard men returned to Detroit.

Will Move to Columbus—The Pharis Tire and Rubber Co., of Columbus, O., which was incorporated recently with a capital of $25,000 to manufacture and sell tires, has been organized. The company takes over a partnership which jobbed and retailed tires on East Gay street. Recently a tire-making plant at Newark, O., was purchased and now plans are being prepared for the removal of the plant to Columbus. The incorporators are Carl Pharis, Roy W. Pharis, Emma W. Pharis, Mabel A. Pharis and Clara Weiler.

New Stearns-Knight Trade Mark—A new trade mark has been adopted by the F. B. Stearns Co., manufacturer of Stearns-Knight cars. It consists of a 3½-inch metal reproduction of an armored knight fastened to the radiator cap of all Stearns-Knight cars. The words "Stearns-Knight" are placed on the pedestal on which the figure of the knight stands, and the emblem as a whole serves to distinguish the car at a glance. The trade mark has been copyrighted and application for registration at the patent office at Washington has been made.

Dahl Broadens Out—Articles of incorporation of the Dahl Punctureless Tire Co. of America, with $6,000,000 capital stock, have been filed in the office of the secretary of state for South Dakota, and this company will at once begin business, with its principal branch office in New York city, 246 West Fifty-ninth street. The business of the new company will be that of manufacturing tires, tire fillers, and selling and dealing in a general line of motor accessories throughout the United States generally. The Dahl Punctureless Tire Co., a Minnesota corporation, has for 3 or 4 years past been engaged in selling the Dahl tire filler and has large selling agencies in Chicago, New York and many other large business centers. The new corporation will take over the patents and the good will of the Minnesota company, and will add to the filler business the manufacture of casings and a full line of motor accessories and will do a general accessory supply business.

Starts Adding to Plant—Plans have been completed and work is to begin at once on the addition to the American-LaFrance Fire Engine Co., Elmira, N. Y. The annex is to be 100 feet long by 25 feet in width, total cost to be $10,000. Orders have been issued to rush work on the building and have it completed in 60 days from date.

New R. C. H. Coupe—The R. C. H. Corporation announces a new coupe. The body, built to accommodate three persons, is very roomy. The standard R. C. H. color scheme, red and black, is continued in the exterior finish, while the interior upholstering is a beautiful dark gray whipcord. Each window is provided with silk shades to match the upholstering. The body is mounted on the regular R. C. H. 110-inch wheelbase chassis as in the touring car and long wheelbase roadster.

Handley Completes Marion Organization—Announcement was made in Indianapolis by President J. I. Handley of the Marion Motor Car Co. of the completion of his new organization. The list of men who will work with Mr. Handley in carrying out the new and extensive policies which he has inaugurated, includes J. B. Myers, vice-president, in charge of production; J. M. Edsall, treasurer; F. G. W. Sudrow, sales manager; M. B. Morgan, chief engineer; W. McK. White, advertising manager.

Omaha Company Pushing Work—The Omaha Motor Car Co., of Omaha, which was delayed for a time by various troubles, is now actively pushing work again on the Omaha car, and expects to have a first installment of twenty-five cars on the market soon, along the same lines as the three models first put out. D. Henry, who was president and manager of the company, still retains the title of president, but no longer is connected with the active management of the company. The other officers are acting in this capacity with L. M. Holthe, from Detroit, Mich., in active charge of operations.

New Canadian Factory—A factory in St. John, N. B., may be turning out motor cars by March 1. The Maritime Car Co. has awarded the contract for the erection of the three large concrete buildings which will comprise this factory at Coldbrook, and the work is to be completed by February 1. One thousand pieces of piling will be driven to form a foundation.

Two Shows for Montreal—That Montreal will see two shows during the coming winter seems now assured, the preliminary arrangements having been completed for the holding of the Montreal motor car and motor truck exhibition in the drill hall January 25 to February 1, 1913, in addition to the one to be run by Wilcox, of Toronto. The last named exhibition is to be conducted by and under the auspices of the local dealers.

Object to Testers—The trustees of Woodlawn cemetery, which is located on Central avenue, Toledo, O., at a recent meeting adopted a resolution declaring that the testing of motor cars in the road to the entrance of the cemetery is dangerous and should be abolished. The matter was referred to the association's attorneys for action. The cars which are now being tested on this street belong to the Willys-Overland Co.

Name Changed—Justice Louis W. Marcus of Buffalo granted an order in special term of supreme court last week allowing the United Motor Buffalo Co. to change its name to the Monroe Motor Car Co. The order was granted on motion of Shire & Jellinek, representing Charles F. Monroe, who purchased the United Motor Buffalo Co. from the United States Motor Co. The motion for change of the firm name was not opposed, as the entire stock was secured by Mr. Monroe, president of the company.

NEW MODEL M 3, STANDARD ELECTRIQUE

Development Briefs

Improvements in Standard Welding Co's. Demountables —New Grinnell Gloves —Resilient Tire

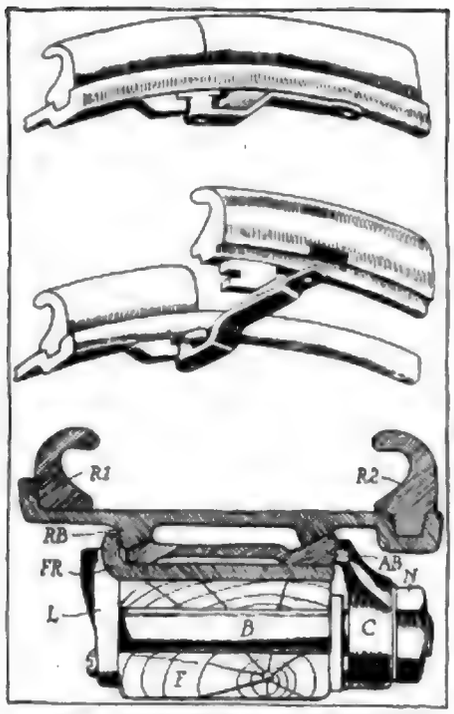


FIG. 1—STANWELD RIM FEATURES

Standard Demountable Rims

COMPRISING demountable, quick-detachable demountable, and plain Q. D. types, the Standard Welding Co., Cleveland, O., has announced a line of rims that embraces many new ideas. The demountable types are, of course, the feature of the line.

The rims are made in three styles of Q. D., non-demountable types, type 50, being an adaptable straight side or clincher type, for those who change their preferences with each change of tires, type 51, for those who are firmly wedded to the straight-sided tire, and type 52, for motorists who stand pat with clinchers. Three styles of demountable rims are made with the same variances in rim base structure, designated types 40, 41 and 42. A light demountable, type 30, is also offered that operates on a different principle from the heavier model.

Fig. 1 shows the type 40, which is the most elaborate rim in the line. It is universal in every particular, being demountable from the wheel, and having a quick detachable rim, adaptable to either clincher or straight-sided tires. The most notable feature in this rim is the method of locking the rim base to the wheel. The adjusting ring is provided with two wedge surfaces, which bear evenly on both sides of the rim base. This construction is exclusive with Standard demountables. The advantages urged by the makers in this manner of retention are many.

Owing to the even expansion of the rim on both sides, less pressure is exerted on the retaining nuts, and on the wheel, than were this pressure on one side only. Tire wear is reduced, over that where the single wedge type is used, due to the elimination of the inevitable distortion attendant to one-sided retention of the rim base; and, because of the uniform pressure at all points of the rim, there is no tendency to wobble, the destructive effect of which is so well known. This construction is claimed to be immune, also, to the effect of rust.

The rim is demounted by unscrewing six retaining nuts, N, and turning the clamps, C, out of the way. This releases the adjusting ring, AB, from its pressure against the rim base, RB, and the two may easily be slipped from the felloe band, FR. But one adjusting ring is necessary to a wheel, as the same one is used with the spare rim as with the rim removed. No tools but a wrench are required for this operation. The detaching feature is simpler yet, requiring but the use of a screw driver to loosen the latch, unlocking the retaining ring and permitting its ready removal.

Type 30 differs from the others in all particulars, being much lighter and simpler. The rim base has its retaining rings integral and is made in both straight-side and clincher form. This base is made in two parts circumferencially locked by means of two spring steel rings secured to one of the sections and slotted to receive protruding lugs on the other section. The demounting feature consists of several wedges operating on bolts extending through the wheel felloe.

Grip-Tite Gloves

Latest among the Grinnell Rist-fit line of motor gloves, the Grip-Tite glove makes its appearance. The Morrison-Ricker Mfg. Co., Grinnell, Ia., is responsible for the new glove, which is designed to afford the wearer a positive grip on the wheel, and to resist an unusual amount of wear. This is accomplished by a double-palm and thumb construction, which is built up in corrugations, which insure a secure grip, with the minimum of effort. Like all Grinnell gloves this one is made of pliable and washable leather, with a perforated back, if desired.

New Spark Plug Proposition

Novel in construction and method of sale, the Sturdy spark plug, manufactured by the Sturdy Mfg. Co., Chicago, illustrated in Fig. 5, presents many departures from the standard. Referring to the drawing, D is the main porcelain, and is protected from breakage by expansion or contraction by the double set of spring washers, F and F1. E is the outer porcelain, which protects the main porcelain, and permits the bushing to be unscrewed from the shell, and in replacing to be drawn to the shoulder, which makes the cracking of the porcelain because of screwing too tight, impossible. The plug is fully protected against leakage by the

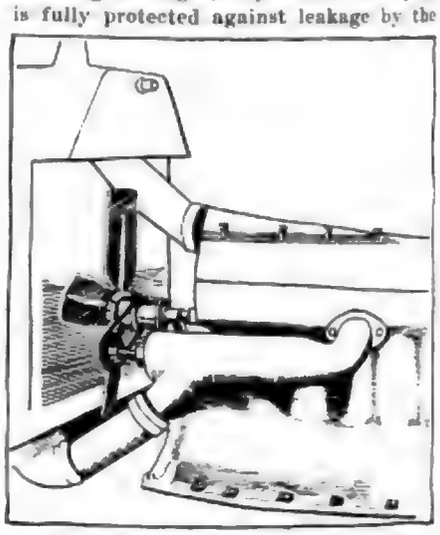


FIG. 2—SCREW PUMP FOR FORDS

counter-sunk copper-asbestos gasket at J. by the annealed copper gasket at H, and by the asbestos gaskets at G and G1. A mica gasket is placed at K, and the points at L are of platinum and irridium.

The plugs are sold in sets of five and seven, for four and six-cylinder engines, the extra plug being put up in a leather case for emergency use. A definite life guarantee is included in each box which covers all failure not due to misuse.

National Spring Tire

With a guaranty of 10,000 miles, the National Spring Tire Co., of New York, is

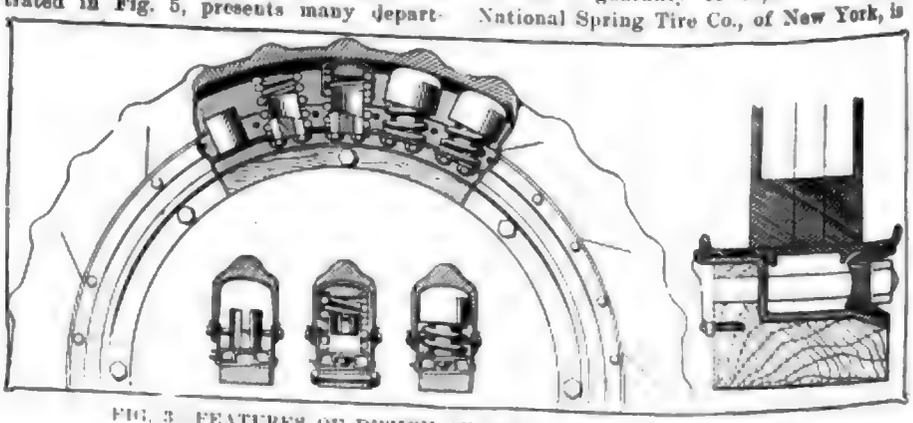


FIG. 3 FEATURES OF DESIGN OF THE NATIONAL SPRING TIRE

Novelties for Motoring

Push-Button Gas Starter—Radiator Cleanser—Spark Plug—Pump for the Ford Model T

marketing the spring tire illustrated in Fig. 3. It consists of a demountable rim of special construction, to which a hollow base of pressed steel is secured. This base is channelled at its middle, and has a series of cylindrical rim plugs, or spring guides, bolted around its periphery, on which are placed heavy coil springs, capped with overlapping compression caps, which bear on an outer fabric or shoe which is removable. A variety of treads will be furnished and various internal variances will obtain. Among these will be side-guys to hold the caps laterally in place, and an annular independently-working metal ring to take the place of guys. The tires will be made double and triple decked—one within one—and with and without outer covering, using instead, cork, pulp or rubber-shod caps. The rims will also vary in construction. The tire will not vary greatly in appearance from the pneumatic, and will fit ordinary wheels. Knobs are placed in the tread over each spring cap to prevent skidding.

Water Pump for Fords

In line with the numerous accessories specially designed for Ford cars, the Fulton McCutchan Co., of Chicago, has just brought out a water circulator, which with very little change may be applied to the thermo-syphon system of a Ford motor. The device consists of a water screw, mounted within an aluminum trunk, and operated by means of a spring belt and split pulley from the fan shaft. It is applied on the left side of the motor in the place of the regular inlet connection, being held on by the same screws. A short length of hose, furnished with the outfit is clamped to the radiator connection, the split pulley is clamped to the fan shaft, and the device is ready for use. It is of cast aluminum, and weighs but 3 pounds. Everything necessary to its application is included for installation as shown in Fig. 2.

Apex Radiator Cleanser

To clean out radiator incrustations is the purpose of Apex radiator cleanser, manufactured by the United States Compound Co., of Buffalo, N. Y.

It is claimed that it is absolutely non-injurious to the radiator, as it contains no alkali, caustic soda, acid, mercury, or other harmful ingredients, being made of harmless vegetable oils. It is mixed with the water in proportions of 1 ounce to a gallon, and the water is drained off after a week's time, bringing with it the scale, sediment and rust.

Simple Gas Starter

Simplicity is the keynote to the Rekar automatic self-starter, which is the product of the Rekar Automatic Starter Co., San Francisco, Calif. It consists of but one main part, with suitable piping. This part is the distributor, which is screwed to the front of the dash, an operating button projecting through an ornamental plate on the front of the dash.

The body of the distributor consists of a plunger valve, having two annular grooves, and connected by a central port to radial ports, with leads to the cylinder pet cocks. One end of the plunger projects through the dash, passing through a stuffing box, the other end being provided with a lead valve head, normally held against its seat by a spring, which is seated in the hollow screw plug of the gas chamber. A supply pipe leads from this chamber to the gas tank. To start the engine, the foot is pressed against the plunger button on the dash, which causes the valve to unseat, admitting a supply of gas to the distributor chamber, the annular groove registering successively with each of the discharge ports. This admits a charge of acetylene gas to each cylinder, at which time the foot pressure is released, and the supply valve is closed by the spring. The engine is then started on the spark. For cold countries an extra port is provided for admission of gas to the manifold, which permits the engine to run on gas until warm, or in case the fuel supply has been exhausted, in which case the button is held as long as a supply of gas is required. The Rekar starter is sold in two-cylinder, four-cylinder, six-cylinder, and eight-cylinder models, and may be applied to any car. As shown in Fig. 4, its installation involves no mechanical changes.

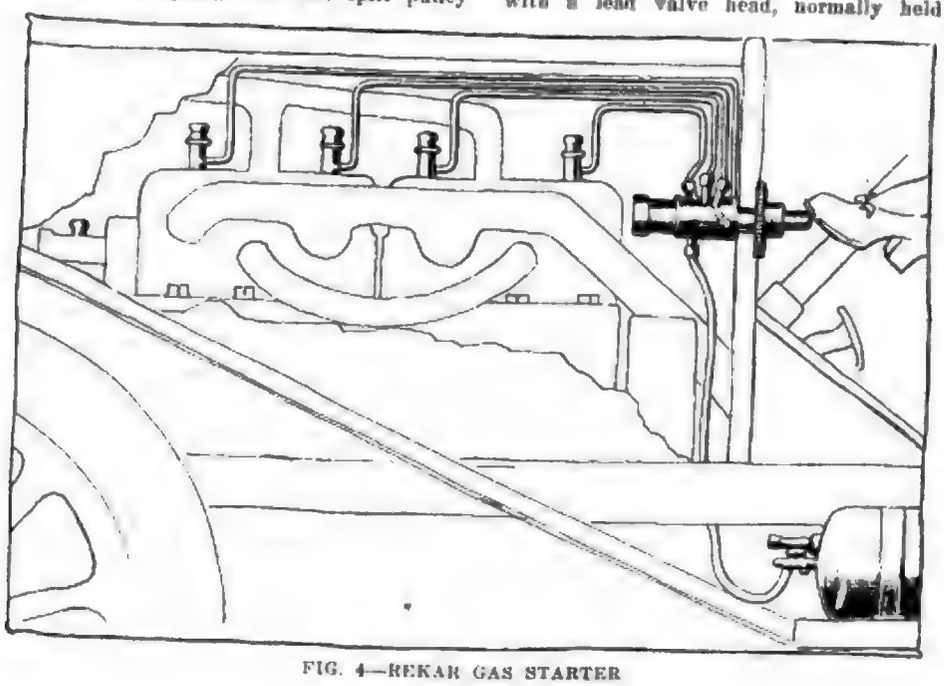


FIG. 4—REKAR GAS STARTER

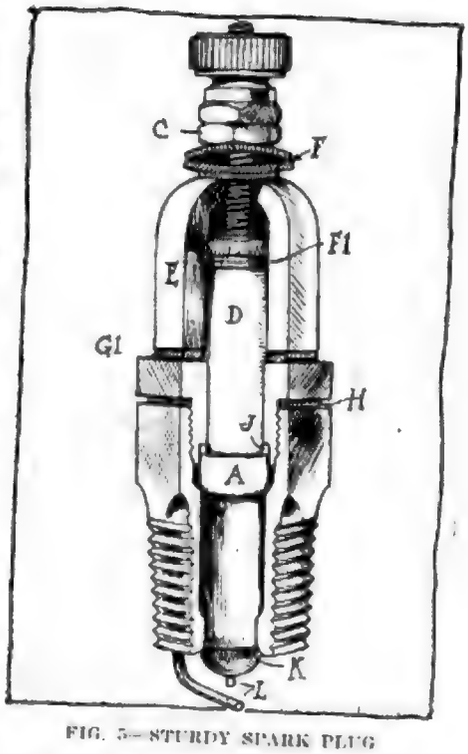


FIG. 5—STURDY SPARK PLUG

Fowler Howler Whistle

Designed to be attached to the exhaust by means of a suitable cut-out valve, the Fowler howler whistle is manufactured by the Fowler Lamp and Mfg. Co. of Chicago. It is substantially an exhaust siren, its peculiar sound being produced by a revolving disk fan within a cylinder perforated at its end. The gas in passing through the vanes of the disk causes it to rotate violently breaking up the gases as they escape through the apertures at the end of the howler. It is claimed that its note, while distinct, is not unmelodious, and that, due to the motion of the revolving disk, it is impossible for it to become clogged.

Brief Business Announcements

Recent Agencies Appointed by Pleasure Car Manufacturers

Towns—	Agent	Car
Akron, O.	Akron Auto Garage Co.	R. C. H.
Albany, N. Y.	Preston Garage	Jackson
Atlanta, Ga.	E. D. Crane & Co.	Pullman
Boston, Mass.	Boston Motor Co.	Pullman
Chicago	R. S. Mattoon Motor Co.	Ohio
Charlotte, N. C.	Piedmont Motor Car Co.	R. C. H.
Colborne, Ont.	Canadian Ohio Motor Car Co.	Ohio
Cincinnati, O.	R. W. Pagels	Pullman
Grand Rapids, Mich.	Stratton & Woodcock Automobile Co	Franklin
Havana, Cuba	American Vulcanizing Co.	Pullman
Hamilton, Ont.	Smith, Stacker & Feeder Co.	Regal
Kankakee, Ill.	Lincoln Garage & Repair Shop	R. C. H.
Lancaster, Pa.	B. F. Futer	Pullman
Lebanon, Pa.	Commercial Garage	R. C. H.
LaSalle, Ill.	F. W. Koenig	R. C. H.
Louisville, Ky.	Younger Auto Co.	Franklin

Town	Agent	Make
Leamington, Ont.	R. H. Ellis	Cadillac
Marshall, Ind.	Thompson and Walther	R. C. H.
Menominie, Wis.	Menominie Auto Co.	R. C. H.
Nashville, Tenn.	Cumberland Motor Car Co.	Franklin
New York	Knickerbocker Motor Car Sales Co.	Havers
Newark, N. J.	Van Denab & Wainwright	Pullman
Newman, Ill.	Henley Eversole	R. C. H.
Penn Yan, N. Y.	A. H. Wagner	Rambler
Pittsfield, Mass.	Arthur LaMott	Pullman
Quebec, Can.	J. E. Paulin	Pullman
Rochester, N. Y.	Crosby Garage	Velie
Rochester, N. Y.	Knipper-Kipp Co.	Henderson
Rochester, N. Y.	Mathias R. Kondolf	National
Slatersville, W. Va.	Tyler Motor Co.	Pullman
Salem, O.	H. L. Slagle & Co.	Krit
Wilmington, Del.	Wilmington Automobile Co.	Lozier
Wilmington, Del.	Wilmington Automobile Co.	Buick

NEW YORK—The Halcomb Steel Co. has opened a sales office at 95 Liberty street.

Troy, N. Y.—A company has been formed at Troy, to handle the R. C. H. in this city. Daniel Conway, Jr., and James N. Bussey are in the partnership.

Syracuse, N. Y.—The Jefferson Garage Co. has secured the agencies for the National, Alco, and Hupmobile. This new concern is at 428-434 East Jefferson street.

Toronto, Ont.—The King Motor Car Co. has appointed the Matheson Automobile Co., 170 Victoria street, Toronto, Canada, as its dealers to cover a large part of the province of Quebec.

Rochester, N. Y.—The Cutting Auto Sales Co., 37 East avenue, has completed specifications for a large garage having a row of stalls for cars with iron grating doors in which owners of motor vehicles may leave their cars and keep the keys.

Dallas, Tex.—A recent addition to the list of dealers in Dallas is the organization of the Sacksteder-Potter Co. The new firm is composed of M. A. Sacksteder, C. H. Potter and Jesse Illingsworth, all of Dallas. This city will be made headquarters for the distribution of American and Marion cars. Branch houses are to be established in different cities of Texas.

Minneapolis, Minn.—The Colby Motor Co., factory branch at 1100 Hennepin avenue, is building a branch house at 1521 Hennepin avenue, to be two stories, 50 by 150 feet on the ground. It will be completed in 3 months. Manager J. V. Campbell will be sales manager at the factory, Mason City, Iowa, and his place here will be taken by Henry Walch, Albert Walch and LeRoy Werges of Monona, Iowa. They will divide the management of the outside and the city sales among them. The Colby garage at Monona will be continued by Joseph Walch. The territory of the branch is Minnesota, North and South Dakota, Montana, Canada and northern Wisconsin.

Saskatoon, Sask.—Richiss & Paterson have commenced the manufacture of tops here.

Skaneateles, N. Y.—The Skaneateles Garage Co., capital $6,000, has been incorporated, the directors being George D. Cuddeback, Edward J. Scott, Florence K. Scott.

Richmond Hill, N. Y.—The Dillman-Helin Motor Co., has been organized here, the directors being William C. Dillman, Richard A. Dillman, Bero W. Holin, W. J. Bissell, Fred J. Hoerlein.

Montreal—The Montreal Automobile Carriage Co. has been formed for the purpose of building all sorts of cars. The Vinot Car Co. of Canada has contracted for all the Vinot cars to be built by the carriage company and a small army of skilled mechanics is on its way from the Vinot factories in France. The chassis and body will be built in its entirety in Montreal.

Montreal—The Begg Motor Co., local agent for the Cadillac, has taken possession of its new garage and salesroom which represents an expenditure of over $200,000, and is situated at the corner of Georgia and Thurlow streets, having also an advantage of an entrance on Alberni street. It has a frontage of 66 feet on Georgia street, with a depth of 132 feet, while enough of the block of land has been retained so that the frontage can be doubled. It is three stories in height and so constructed of reinforced concrete that it will carry three additional stories. It is faced with cement brick and is thoroughly fireproof throughout. The offices and showrooms of the company cover 5,500 square feet of floor space and is finished in white tile. The garage itself provides accommodation for at least 200 cars, and will contain every modern facility for handling motors, including two 5-ton freight elevators, and one large passenger elevator.

Plattsburg, N. Y.—The Pepin & Mouso Co. has formally opened its new garage in Plattsburg, N. Y.

Winnipeg, Man.—The Electric Motor and Sales and Repair Co. is the name of a new company recently incorporated to do business in this city.

Minneapolis, Minn.—The Moline Automobile Co., factory branch, has made a 2-year lease of the building at 1401 Hennepin avenue. W. J. Lawrence is manager.

Montreal—The Bellerive Garage and Auto Co., Ltd., has been incorporated to do business here as agent for motor cars, commercial trucks, and doing a general repair business with a capitalization of $90,000.

Cleveland, O.—Harry S. Moore has been appointed special factory representative and general manager of the Stutz Motor Car Co., the new local sales agency for Stutz cars. Temporary quarters have been established at 1761 Crawford road.

Montreal—Drednot Motor Trucks, Ltd., with a capital of $50,000, is building 1-ton motor trucks for the Canadian market. The directors are: W. L. Haskell, president; H. S. Ross, K. C., John S. Rigby, vice-president and managing director; V. S. Ross; L. C. Haskell, secretary-treasurer; J. E. Merritt and D. S. Whittall.

Minneapolis, Minn.—The Minnesota Cartercar Co. has been organized with A. R. Workman, formerly of Ainsworth, Neb., as president. It will manage a factory branch of the Cartercar company with Minnesota, Montana, the Dakotas and northern Wisconsin as the distributing territory. A service department will be maintained at 1027 Hennepin avenue. S. W. Kamm, vice-president and sales manager, was recently manager at Omaha for Fuller & Johnson, manufacturers of gaso-

line engines. Secretary A. D. Hunter was formerly with the Buick.

Gilbertsville, N. Y.—The Meyers garage and repair shop has formally opened a large garage in Gilbertsville..

Rochester, N. Y.—The Knipper-Kipp Co. has opened its new garage, known as the Kondolf, at the Monroe avenue bridge. The new garage is one of the largest in Rochester.

Winnipeg, Man.—The Peerless Punctureless Tire Co. has opened offices on Main street, and also has completed arrangements for a factory where this make of tire will be manufactured for the trade in Canada.

Brooklyn, N. Y.—The Braender Rubber and Tire Co., New York city, with a factory at Rutherford, N. J., has established a branch office and salesrooms at 1211 Bedford avenue, Brooklyn. C. W. Smith is manager. This company has a New York store at 1987 Broadway, between Sixty-seventh and Sixty-eighth streets.

San Francisco, Cal.—The distribution of the Michigan cars for 1913 in California, Nevada, the Hawaiian islands and the Orient will be made by the Michigan Motor Car Co., California branch, a $1,000,000 corporation just organized. The following officers have been elected: President, V. L. Palmer; first vice-president, F. B. Lay, Jr.; second vice-president; W. H. Cameron, third vice-president, Geo. H. Daugherty; treasurer and general manager, C. P. Kiel; secretary, C. C. Bobb. The above, with H. L. Kiel, son of C. P. Kiel, constitute the board of directors.

Rochester, N. Y.—The firm of F. R. Luescher, Inc., will formally open its new home, 191-195 East avenue, Rochester, October 1.

Winnipeg, Man.—The Breen Motor Co., Ltd., of this city, has been appointed sole distributor for the Cole car in the provinces of Manitoba, Saskatchewan, Alberta, British Columbia.

Detroit, Mich.—Russel A. Shields, who has been associated with the Studebaker corporation in the capacity of testing engineer, has resigned to accept a position in the sales department of the Chalmers Motor Co., with headquarters at Detroit.

Tilbury, Ont.—Residents of Tilbury carried a by-law last week to grant a loan of $5,000 to the Imperial Rubber Co. for immediate construction of its factory in which to manufacture rubberized cloth for motor cars. The loan is repayable in 10 years without interest.

Buffalo, N. Y.—The A. W. Haile Motor Co. has been incorporated to handle retail Studebaker sales in Buffalo, N. Y. Arthur W. Haile is president and general manager, and Bradley H. Phillips, secretary-treasurer. The firm has rented the centrally located salesroom of the Studebaker Corporation of America, 1015-1017 Main street. In addition to Buffalo, the Haile Motor Co. will handle retail Studebaker sales in Erie and Niagara counties. The Studebakers' Buffalo wholesale branch remains at its former location in charge of B. F. Kinsman, and is unaffected by the change.

Rochester, N. Y.—John Meiser, superintendent of the Selden Motor Car Co., has resigned to become connected with the Knipper-Kipp Co. in the Kondolf garage, Monroe avenue.

Fargeville, N. Y.—P. W. Devendorf, proprietor of a large garage at La Fargeville, has secured the Arsenal street garage at Watertown, N. Y. He will conduct both establishments.

New York—It is announced that C. S. Henshaw has resigned as manager of the Thomas Motor Co., of New York, to take effect in the near future. It is not known at the present time what course Mr. Henshaw is to follow. His permanent residence is Belmont, Mass.

Dolgeville, N. Y.—The rapidly increasing business of the Smith Brothers garage has necessitated the enlargement of the modern fire-proof building on Slawson street, in which it is located. A contract has been let for the building of a 40 by 40 addition which will be completed this year.

Minneapolis, Minn.—Amund N. Dahl, Frank H. Lewis, and Freling H. Stevens of Minneapolis have incorporated the Dahl Punctureproof Tire Co. with a capital of $6,000,000, at Pierre, S. D. Business offices are to be in New York. Other incorporators are I. Seery, Wausau, Wis.; Russell N. Stewart, New York; Homer St. Denehy, Buffalo; Thomas A. Callahan, Boston, and Tom C. McNamee, Pierre.

Recent Incorporations

Boston, Mass.—Berkeley Motor Car Co., capital stock, $1,000; directors, F. H. Freeman, E. Staunton, H. A. Wentworth.

Boston, Mass.—F. A. Dutton Motor Co., capital stock, $25,000; directors, F. A. Dutton, C. H. Farnsworth, J. C. Smith.

Boston, Mass.—Standard Auto Supply Co., capital stock, $100,000; directors, E. W. Shepherd, M. F. Culliney, E. A. Farren.

Boston, Mass.—Tyler Brothers Corp., capital stock, $100,000; general motor car business; directors, F. J. Tyler, L. S. Tyler, J. W. Gibbs.

Boston, Mass.—B. & P. Sales Co., capital stock, $50,000; general motor car business; directors, R. B. Skinner, G. B. Bowman, L. A. Brimmer.

Boston, Mass.—W. H. Webster Jones Co., capital stock, $15,000; to deal in power vehicles; directors, W. H. Jones, Webster Jones, G. L. Ellsworth.

Boston, Mass.—E. C. Andrews Co., capital stock, $10,000, to manufacture motor car tops, etc., incorporators, E. C. Andrews, N. Russell Lynn, Z. A. Hall.

Buffalo, N. Y.—Continental Motors Corp., capital stock, $100,000; incorporators, G. F. Matthews, F. V. Whyland, A. E. Choate.

Buffalo, N. Y.—A. W. Haile Motor Co., capital stock, $25,000; incorporators, A. W. Haile, B. H. Phillips, E. C. Scheneker.

Buffalo, N. Y.—A. W. Haile Motor Co., capital stock, $25,000; to deal in motor cars; incorporators, A. W. Haile, B. H. Phillips, E. C. Schlenker.

Daytona, Fla.—Pneu Tire Filler Co.; incorporators, V. G. Collins, E. Oliver, E. F. Oates, H. C. Thompson.

Dunkirk, N. Y.—Dunkirk Specialty Co., capital stock, $5,000; to sell supplies; incorporators, B. C. Candee, S. B. Culver, J. M. Henderson.

Durham, N. C.—R. B. Lyon Motor Car Co., capital stock, $50,000; incorporators, E. B. Lyon, J. M. Black, J. E. Johnson.

Ft. Wayne, O.—Drage Harris Motor Truck Sales Co., capital stock, $10,000; directors, F. A. Drage, D. H. Harris, H. L. Somers.

Highland Park, N. J.—Walter Williamson Automobile Co., capital stock, $10,000; to deal in motor cars; incorporators, W. M. Williamson, W. Whittlesey, V. J. Miller.

La Crosse, Wis.—Hoff Motor Cor Co., capital stock, $500,000; incorporators, J. E. Hoffwever, A. J. Hoffwever.

Manhattan, N. Y.—Fiat Motor Sales Co., capital stock, $300,000; to manufacture and deal in motors, engines, etc.

Milbridge, Me.—Milbridge Motor Co., capital stock, $10,000; directors, J. W. Sawyer, J. S. Wyman, A. A. Wallace.

New York—Gasosava Co., capital stock, $50,000; incorporators, J. J. Smart, G. T. Keen, E. Cable.

New York—Globe Taxicab Co., capital stock, $2,000; incorporators, M. Cox, Charles Aaronson, John Lambert.

New York—Whyle S. Merritt Co., capital stock, $10,000; incorporators, Paul Thamm, S. W. Merritt, C. V. Morse.

New York—United Tire Sales Co., capital stock, $500; incorporators, A. G. Thaanum, J. T. Weed, Max Greenberg.

New York.—Fiat Motor Sales Co., capital stock, $300,000; incorporators, Charles Whitney, W. Scanlon, J. N. Blair.

New York—North River garage, capital stock, $20,000; incorporators, W. E. Lockwood, L. E. Jelly, R. E. Shaw.

New York—Viking Mfg. Co., capital stock, $25,000; to make motor cars, etc., directors, A. R. Bangs, R. Condon, A. O. Briggs.

New York.—Viking Mfg. Co., capital stock, $25,000; to manufacture motor trucks; incorporators, A. R. Bangs, R. Condon, A. O. Briggs.

New York—New York Electric Vehicle Association, capital stock, $50,000; incorporators, G. Tierman, F. H. Parcello, R. G. Redlefsen.

New York—Salvini Electrical Horn Mfg. Co., capital stock, $50,000, to manufacture horns and supplies; incorporators, E. Salomon, G. S. Salomon, S. Salvini.

New York—Ideal Automobile & Garage Co., capital stock, $10,000; to handle supplies for motor vehicles; incorporators, J. W. Collopy, Jr., R. H. Smith, A. P. Morewood.

New York—Gassova Co., capital stock, $50,000; to deal in patent articles for operating and repairing motor vehicles; incorporators, J. L. Smart, G. T. Keen, E. Cable.

New York—Roulements E. Debois Ball Bearing Co., capital stock, $25,000 to manufacture ball bearings; incorporators, J. S. Sherman, W. W. Sherman, H. T. Sherman.

Pierre, S. D. Dahl Punctureproof Tire Co., capital stock, $6,000,000; directors, A. N. Dahl, F. H. Lewis, F. H. Stevens.

Port Chester, N. Y.—Lowden and Flint's City Garage, capital stock, $3,000; incorporators, C. H. Flint, G. M. Flint, A. B. Lowden.

Providence, R. I.—A. W. Harris Oil Co., capital stock, $75,000; to deal in lubricating oils, etc.; directors, B. S. Terry, A. D. Green, G. F. Heywood.

Springfield, Mass.—Harley Co., capital stock, $50,000; motor car business; directors L. J. Harley, Jr., L. J. Harley, T. B. Purves, Jr.

Stillwater, Minn.—Republic Motor Co., capital stock, $10,000; to manufacture motor vehicles; incorporators, G. H. Sullivan, L. L. Manwaring, P. H. Guilford.

Troy, N. Y.—Troy Motor Co., capital stock, $10,000; to deal in motor cars, incorporators, F. S. Snyder, F. A. Snyder, J. B. Wood, J. A. Wendell, R. G. Thormeyer, H. P. Schoenmaker, C. R. Kilmer.

Wellsburg, W. Va.—Brooke Auto Co., capital stock, $10,000; incorporators, J. H. Scott, W. H. Scott, C. M. Magee, F. A. Chapman, E. A. Fegan.

Wilmington, Del.—Auto Service & Supply Co., capital stock, $15,000; to manufacture and deal in motor cars.

Wilmington, Del.—Salisbury Ball Bearing Mfg. Co., capital stock, $100,000; incorporator, H. Ralph Ewart.

Wilmington, Del.—Automobile Tire Filling Sales Co., capital stock, $1,000,000, incorporators, C. G. Stiegler, O. W. Stiegler, W. O'Keefe.

Wilmington, Del.—Automobile Tire Filling Sales Co., capital stock, $1,000,000; incorporators, C. G. Stiegler, O. W. Stiegler, W. F. O'Keefe.

Worcester, Mass.—Morgan Motor Truck Co., capital stock, $300,000; directors, C. B. Foster, E. F. Jones, C. H. Derby.

The Motor Car Repair Shop

FIG. 1—COMBINED STOPPER AND SWAB FOR SHELLACING GASKETS

Making Shellac Gaskets

EVERY motor car repairman is familiar with the use of shellac for making an oiltight joint, and probably no substance is more commonly used for this purpose when joints are to be made between the sections of a crankcase of a motor, or the gearcases of change-speed or rear axle mechanisms. It also is a well-known fact that shellac is a dirty, sticky substance to handle owing to the fact that it usually gets on the hands where it dries quickly and is difficult to remove. But means can be provided with little trouble by which it may be employed without this disagreeable feature.

If a bottle or can of shellac is to be prevented from drying up, the receptacle in which it is kept must be corked up when not in use. If a brush is employed in its application, it must be adjustably mounted in the stopper, or removed and carefully cleaned with alcohol or varnish remover immediately after its use. Otherwise the shellac will dry upon it and render it about as useful as a stick. A stick, by the way, is the most common means of applying shellac in the motor car repair shop.

There is a better method, though, which may be employed with improved results. It consists of an egg-shaped wooden stopper with a handle, as shown in Fig. 1. When a workman wishes to spread a coat of shellac upon a gearcase cover or a gasket, he has but to invert the bottle with the stopper in place, then remove the stopper and roll the large end over the surface to be coated and a coat of shellac is left in its wake.

Making Gaskets

One of the first lessons a young repairman is taught when he commences his career in the shop is that of making gaskets. The gaskets between the bases of the cylinders and the crankcase generally are made by stretching drawing paper or wrapping paper over the mouth or base of the cylinder, and then, while holding the paper firmly in place with one hand, operating the ball peen hammer as shown in Fig. 2. The round end of a light hammer should be employed in this process, and the gasket is cut out by lightly tapping the sharp edges of the cylinder base through the paper. This method is often employed in making gaskets for aluminum parts but results in damage to the casting. Aluminum is very soft and the edge is broken down, generally after the first gasket is made, the paper does not cut so easily, more hammering is required, the area of contact surface is reduced and the joint is thus more difficult to render oil-tight.

To make a gasket for an aluminum case, the paper should be pressed over the bolt holes and edges of the case so that an impression is made that can be seen easily; the gasket then can be cut out readily with a pair of scissors or a knife in much less time than would be required to do it with a hammer. Lead, copper and asbestos gaskets for flange connections of the water and gas manifolds can be made easily with a peening hammer as paper gaskets are made, but rubber gaskets are more easily cut with a knife. In making gaskets from wire asbestos sheet packing, the hammer canot be used to advantage, and it is better to cut them out with a pair of tin snips or an old pair of shears.

Speedometer Repairs

There seems to be a prevailing disposition on the part of many owners and amateur repairmen when the general overhauling of a car is in progress to overlook or neglect those outside fittings which under ordinary circumstances give very little trouble. In this category the speedometer comes in for no small share of neglect. When the car goes into the shop, this instrument is disconnected usually, and carefully laid away with other fittings until the time comes for their replacement, and that is often all the care that instrument receives.

On the other hand, if the owner has been having trouble with the speedometer, he reports the matter to the repairman and then it too receives attention. The repairman, however, very properly, never attempts to repair the internal mechanism of the speedometer, but sends it to the nearest speedometer agent. It is folly for the repairman, driver or owner not entirely familiar with the construction of the speed indicator to run the risk of injuring the instrument just to satisfy his curiosity or to fix something—he knows not what—without the ability or special tools required to do it.

All reputable manufacturers of these instruments have agents in the larger cities throughout the country who are equipped for repairing these instruments and have in their employ skilled mechanics who do nothing else but install, overhaul and regulate them. The troubles to which the speedometer are subject are comparatively few and usually of such a nature as to be quickly remedied under proper treatment, but the necessary repairs and adjustments are difficult and perhaps impossible without the special tools and devices. With the knowledge of the expert and the aid of special appliances 5 or 10 minutes is all the time usually required to locate and learn the cause of the trouble and in most cases the most extensive repair requires only a comparatively short time.

What is more, no charge is made for the services of these workmen, as it is the desire of the manufacturers and dealers to keep their instruments in the best possible condition. The speedometer is on the job whenever the car is in motion and it, as well as the car, requires the attention of an expert about once a year. It is valuable and practicable to take advantage of the free services of the manufacturers' representative when the instrument is in need of repair or adjustment. The location of the nearest repair station can be learned by writing to the maker and the instrument sent by express for adjustment. The express charges will be less than the cost of the generally inefficient repair of the local repairman and a satisfactory job is assured. The liability to damage of the instrument in the hands of an inexperienced workman is great.

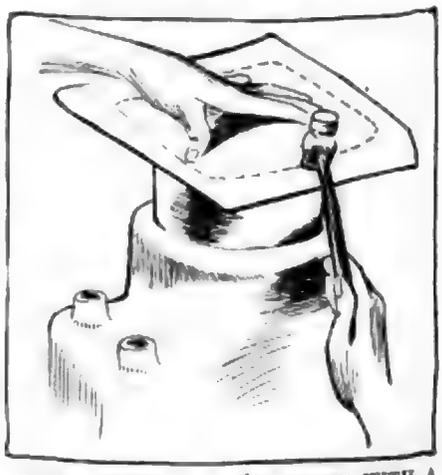


FIG. 2—CUTTING OUT GASKETS WITH A MACHINIST'S HAMMER

FOR SALE AT ALL NEWS STANDS TEN CENTS A COP

MOTOR AGE

VOLUME XXII CHICAGO, SEPTEMBER 19, 1912 NUMBER 12

Mighty Sensible Advice

Car Owner (To Salesman)

"I've just had my car insured, as you can see, and I find in the policy a printed rider, which strongly advises me to equip my tires with Weed Chains. What about it?

Salesman

"It means that insurance companies have made a special investigation and they have found that nine-tenths of all automobile accidents are caused by skidding—that ***skidding accidents are practically eliminated*** by the use of tire chains, and if they could persuade all their policy holders to carry Weed Chains and put them on when the roads are wet and slippery, ***they would materially reduce their risk.*** Can you imagine a stronger endorsement? They have taken this action after a careful consideration of the evidence presented through the most crucial test upon all manner of city pavements and upon country roads—under all conditions. They have found that ***Weed Chains are an absolute safeguard.***"

Car Owner

"I am convinced now that my car should be equipped with Weed Chains: fix me up right away. ***If I had known how necessary Weed Chains really are, at the time my car was delivered I would have insisted that they be included as part of its standard equipment.***"

Salesman

"Now you're wise—let me tell you something: I have driven an automobile for years. At first I thought I could get along without tire chains, but now I would no more think of starting on a trip without them than without gasoline. I keep my car insured, of course, but I want ***safety insurance,*** besides—the kind that ***prevents*** accidents; that ***keeps me out of trouble*** and gives me more absolute confidence that ***my life is being safeguarded.*** That's why I always carry Weed Chains with me.

Don't stick them into the tool box and leave them there. That doesn't do any good. ***Put them on and use them*** when it starts to rain, or when the roads are slippery and uncertain."

WEED ANTI-SKID CHAINS

Real Life Insurance—the Kind That Saves Lives

Has your own experience or that of others taught you no lesson? Are you still taking your life in your hands by neglecting to take the necessary precaution against skidding? Are you still unwisely depending on rubber alone for the safety of yourself, the occupants of your car and other road users?

There is only one way to be sure of perfect control and safe, comfortable driving through deep mud, treacherous sand or on slippery pavements, and that is—equip all four wheels of your car with Weed Chains. On the rear wheels they insure traction and ***prevent skidding,*** on the front wheels they make steering easy and sure.

Weed Chains do not injure tires because they are free to creep. They are not anchored, but continually shift their position on the shoe with every revolution of the wheel. Manufacturers will not guarantee their tires unless the chains used on them are free to creep. Are put on in a jiffy without the use of a jack or other tools.

If you haven't a set of Weed Chains, or if you have a pair for the rear wheels only, get a full equipment now. Stop at your dealer's the next time you are out in your car and provide yourself with **the kind of life insurance that saves lives.**

Weed Chain Tire Grip Company, 28 Moore Street, New York City

MOTOR AGE

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Contents

DEPARTMENTS

VOL. XXII, NO. 12 CHICAGO, SEPTEMBER 19, 1912 $3.00 PER YEAR

MOTOR AGE

Milwaukee's Dreams All Coming True

Story of How the Badgers Conceived Idea of Promoting Big Road Races and How They Made Good

By L. E. Meyer

MILWAUKEE, Wis., Sept. 17—One cold night way back in February, as members of the Milwaukee Automobile Dealers' Association were wending their weary way down seven flights of stairs in the Sentinel building, after spending hours in closing up the last accounts incurred in the conduct of the highly successful motor show of the month before, Bart Ruddle, assistant secretary and manager of the association, grabbed the last few stragglers by their arms and said quietly, "Now we ought to go after the Vanderbilt cup and grand prix races for Milwaukee next fall." There was a general chuckle, for the simple statement seemed more of a joke than anything else.

With characteristic persistence, Ruddle delved into the proposition, striking deep at every angle of a task colossal, which he knew and believed could be swung

"THE FINANCE COMMITTEE WAS WORKING NIGHT AND DAY TO RAISE THE $50,000 FUND"

if gone after in the proper manner. Within a month's time he had been at Savannah and New York on secret missions. Three days after the monthly meeting of the association in April, the public was astounded by the actual announcement that the Vanderbilt cup and grand prix would be run at Milwaukee in September.

Milwaukee Astonished

There is a great difference between saying "the races will be run" and doing it. No one realized it better than the members of the M. A. D. A. Milwaukee people simply laughed at the monumental nerve of a body of twenty-two men in trying to promote an undertaking which was regarded as possible of accomplishment only by the millionaire sportsmen of New York or Savannah, but Ruddle and his cohorts gritted their teeth and went at it.

Even while the Automobile Club of America, the Motor Cups Holding Co., the Savannah Automobile Club and others directly interested in the running of previous contests for the Vanderbilt and grand prix, were thinking over the request of the Milwaukeeans to be permitted to undertake the proposition, the racing committee of the M. A. D. A., with A. A. Jonas as chairman, and Manager Ruddle went out to scout for possible road race courses in the vicinity of Milwaukee. A dozen courses were laid out on the maps of Milwaukee, Waukesha and Racine counties. In the mud and slush of late spring the committeemen went out in their cars to visit town chairmen and resident farmers along the prospective courses. Most of them shook their heads sadly and said, "You fellows must be crazy." The rest listened courteously but declined firmly to be a party to any undertaking so obviously ridiculous. For there was then a well defined feeling against motorists in general because of the acts of a few who burned up the country roads in their travels for business or pleasure, mostly pleasure.

The outlook was gloomy, but just then word came from New York that the races had been awarded to the M. A. D. A. for 1912. The M. A. D. A.'s were jubilant and out they went again to look for a course. This time they found a friendly feeling right in Milwaukee county, in Greenfield township, the home of a number of wealthy retired farmers and capitalists who not only possessed a certain amount of sporting blood, but realized at once what immense value the international road racing proposition, if successfully carried out, would be to Milwaukee and Milwaukee county.

Fred Wagner was brought out from New York, ostensibly to look over prospective course, but actually to talk over the matter and say if he would throw his strength back of the thing. A big banquet was given in his honor and then he was bundled into a big car and taken over the Greenfield course. He inspected it minutely and said, "Fine."

Raising Guaranty Fund

Then came the command to put up a guaranty fund and give concrete assurance to the governing bodies that the races would not only be high class events, that it be properly policed, and a hundred and one other details. While the finance committee was working night and day to get subscriptions to a $50,000 fund, the racing board was working with the town board of Greenfield to get the consent of property-owners to run motor races over their public highways, lease their frontages, or that part needed for grandstands, bleechers, training camps, supply stations, scoreboards, etc.

Both committees were not quite wholly successful, and the M. A. D. A. members dug down into their jeans and financed the things themselves, while the matter of a course was left in abeyance because at just this stage of the game there was a sudden inspiration in the minds of the chairman and members of the town board of Wauwatosa, Milwaukee county that the proposed racing carnival was something they could not overlook.

Wauwatosa Makes Offer

Then came the offer of Joe Guenther, town chairman, of a course of suitable length and all the rights and privileges of acreage, frontage, public highway racing rights and everything else, for and in consideration of having built without cost to the town board, approximately 8 miles of the most modern highway in America. It was too good to be true, but another condition of the offer was that everything must be kept secret until the town board had obtained the signatures of every property-owner or resident tenant of farms lying along those parts of the public roads which would be included in the race course. The pledge of secrecy was given.

It was a most fortunate affair, coming at a most propitious time. Here was provided the foundation, at least, of a road racing course, without any cost excepting the expense of reconstructing the public highways. The town board put the proposition up to the farmers in this way: "We want you to sign over all the desired rights and privileges and in return you get 8 miles of the finest roads in the country." There were a few murmurings, of course, and demands for cash for giving up rights, but the majority was so overwhelming that the squealers were crushed down and out. A few have since got their little bit, but not for their consent—it was for actual damage done to their property by reason of the cutting away of land for improving turns, or the destruction of crops to make room for grandstands, bleachers, and other similar requirements. But this expense is a trifle, for by good fortune in selecting places for these structures, it was necessary to destroy only

eighteen rows of corn on the site of the judges' stand, press stand and executive offices, while the grandstands and pits are standing on a wide expanse of bare field, from which the last crop of hay was cut before the first plank was laid for the stands.

Pabst Supports the Meet

Even before a course had been definitely settled upon or the undertaking was well under way, the M. A. D. A. went to Colonel Gustav Pabst, the millionaire brewer of Milwaukee and asked him what he would do for the good of the cause. "What do you want?" asked the colonel in his customary liberal spirit when the good of Milwaukee is concerned. They told him they had picked him out as the man who would donate a loving cup to be the chief prize in a third competition to be run at the time of the Vanderbilt and grand prix, a trophy representative of Milwaukee as the Savannah challenge cup was of Savannah. Turning to his private secretary, the colonel wrote out an order to that effect—and this was the birth of the Pabst Blue Ribbon trophy.

Then the need of a fourth trophy, for the light cars, to round out a full program of events, was filled by the favorable response to a request directed to Charles H. John, president, and A. F. Milbrath, secretary and treasurer of the Wisconsin Motor Mfg Co., of Milwaukee. The Wisconsin Challenge trophy is the official title of this cup.

The only obstacle encountered by the M. A. D. A. through it all was the failure of the road construction contractors to complete the job in time. This caused the postponement on last Thursday night, September 12, of the grand prix competition from Tuesday, September 17, to Monday, September 23. It was a sad-faced gathering of promoters which finally admitted to itself that it was up against it on the course proposition and that postponement was inevitable. The contractor was fired on the spot and new brains put at the head and the course is ready on schedule time under the rearrangement of dates.

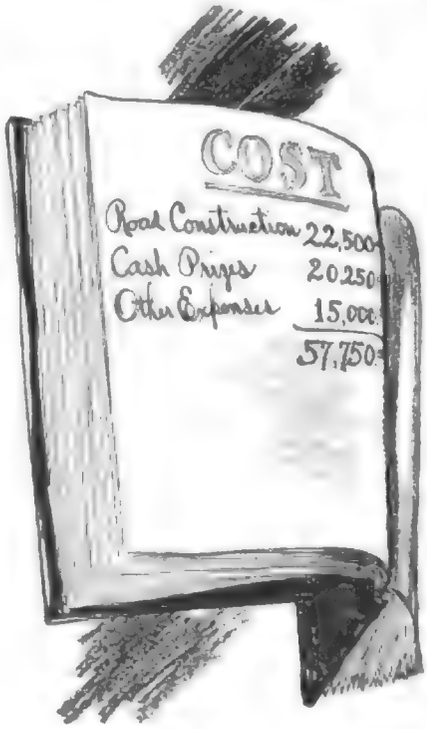
Good Location of Course

Although ½ mile of the course runs along the limits of the city of Milwaukee and occupies the frontage of a public park, the only legislative mill the M. A. D. A. was obliged to go through was the town board of Wauwatosa—and these estimable gentlemen signed the resolution giving the right to race on public highways the minute it was drawn up. In fact, the offer to give the dealers' association a course was, for all practical purposes, the necessary legislation to this end. The rest of it was easy—to furnish a bond of $50,000 to the township of Wauwatosa to cover all liability for damages from any source whatsoever.

A few obstinate farmers were encountered when the parking space plan was laid down. In getting the consent of

"MANY COURSES WERE CONSIDERED"

the property-holders for the use of their acreages for the purpose of the races, the association stipulated certain reservations of rights, principally that the owner may accommodate a liberal number of relatives and friends on his road frontage, but all moneys accuring from the sale of parking space thereon go to the association.



THE COST OF IT ALL

The road construction will cost approximately $22,500. The association has hung up cash purses totalling $20,250. The other expense will figure up at least $15,000, a total expense of approximately $60,000.

This will be offset by the entry fees; sale of general admission at $1 each, sale of grandstand seats at from $1.50 to $1; bleachers, 50 cents; parking spaces from $40 down to $10 per car.

As compared with the system at Elgin, the M. A. D. A. is fortunate indeed in that it nets the entire gross receipts and is not required to split with the farmers owning property fronting on the roads used for the Milwaukee course. The farmers sold their consent simply "in recognition of the benefits which I will derive as a property owner or residing tenant on the particular road in the town of Wauwatosa from the valuable improvements which your association is proposing to make." The contract is as follows:

Contract With the Farmers

Town of Wauwatosa, Wisconsin, ... 1912. Milwaukee Automobile Dealers' Association, Milwaukee, Wis. Gentlemen—In recognition of the benefits which I will derive as a (property owner) (residing tenant) on the ..... road in the town of Wauwatosa from the valuable improvements which your association is proposing to make upon the Fond du Lac avenue road, the town line road, South Fond du Lac avenue road and Burleigh street, in the town of Wauwatosa, for the purpose of putting the said roads in condition to run thereon the automobile races known as the grand prix, Vanderbilt cup, Pabst Blue Ribbon trophy and Wisconsin Motor trophy races next September, I hereby join with other property owners and residents in this town in a petition to the town board of the town of Wauwatosa to grant a permit to your association for the use of said highways, and in further evidence of my personal approval of the holding of said races upon the highways above indicated, I hereby agree to cooperate in every way with the race committee of your association and to assist your committee in protecting life and limb of spectators on the premises abutting on any of said highways belonging to me or under my control, and to conform in all respects to the rules of your said committee, and to cheerfully recognize and obey such regulations for the use of said course as may by your committee be made.

I further agree under no circumstances to permit any special buildings or structures, such as grandstands, bleacher stands, advertising display boards, or other buildings of any kind whatsoever for the accommodation of spectators of said races, or for the display of advertising, or the sale of intoxicating liquors, refreshments, or for any other purposes whatsoever, to be erected or placed upon any lands or premises owned or controlled by me and abutting on any portion of said course, without the written consent and approval of your racing committee.

I further agree to permit your committee to establish and maintain on any premises owned or controlled by me all necessary signal stations, telephone stations, scoreboards, camps, supply depots for the racing cars, and emergency hospitals, for the proper and safe conduct of said races, without charge, and to place telegraph and telephone poles temporarily inside the fence line on any of the said premises, and to remove any trees or shrubbery from any of said highways which grow or are so situated as to endanger the life or limb of the contestants in said races or interfere with the same; provided, however, that no such signal station, scoreboard, camp or poles shall be so situated as to unreasonably inconvenience the usual occupations carried on on my said property; and provided that the cost of the removal of any telegraph or telephone poles, trees, brush, etc., shall be paid for by your association; and on the further condition of your agreeing to remove any apparatus, tents, poles, boards, buildings and structures which may be placed upon my property within forty-eight hours following said races. This letter may be considered as constituting an agreement when accepted by you.

All Set for Milwaukee Speed Carnival

Failure to Complete Course in Time Causes Postponement of Grand Prix to Monday, September 23—Meet to Open With Small-Car Races, With Vanderbilt on Saturday—Good Fields to Compete in Each of Four Events

MILWAUKEE, Wis., Sept. 16—Milwaukee's big road racing carnival will open on Friday noon with the first running of the races for the Pabst Blue Ribbon trophy and the Wisconsin Challenge trophy, the big event scheduled as the curtain-raiser, the fourth contest for the grand prix of the Automobile Club of America having been changed to the wind-up, which will take place on Monday, September 23, following the Vanderbilt on Saturday, September 21. It would have been possible to run the grand prix as scheduled on Tuesday, September 17, but this would have meant that the cars and drivers would have taken the course without a minute's practice, for the roads were not completed until late Monday night. No driver but one bent on suicide could have considered such a thing.

The necessity of a change in the program so that the first events would be set back to give the Milwaukee Automobile Dealers' Association the better part of an additional week to get its course in shape was anticipated by the inner circle for some days in advance of Thursday, September 12, when Starter Fred J. Wagner arrived from New York to begin his work. Mr. Wagner took a run around the loop Thursday noon and at the finish shook his head and began to figure out a new scheme. Thursday evening the association was called together to hear a plain-spoken word by Wagner and at the conclusion of the meeting it was announced that the grand prix would be postponed from Tuesday until the following Monday, and the other events run as scheduled.

Forced to Change Date

The action temporarily staggered the promoters, but all realized the absolute necessity of the change, and then started out to make good. The road construction contractor and his assistants were fired on the spot and some new and fresh blood infused into the thing. Friday morning the dealers cast off their blue spectacles when they saw a half-dozen gangs of workmen driven at top speed by the new bosses, actually accomplishing something worth while. The course fairly grew while one looked and the fast work was carried on throughout the night by the light of torches and head-lights focused to the best advantage. Monday night the last drop of oil was on the roads and the final coating of sand was being applied. Starter Wagner announced that official practice would positively start at 11 o'clock Tuesday morning—which, by the way, is the hour at which the grand prix was to have been started on that day.

The new arrangement gives the light-car drivers 2 full days of practice; the Vanderbilt contestants 4 days, and the competitors in the grand prix 6 days in which to tune up their cars and make that close acquaintance with the roads which is so necessary to make the best speed possible.

Entry List Reopened

The change in the program carried over the closing of entries for the grand prix to Wednesday night. Twelve cars already have been nominated, and it is possible that two or three more will come in, as it is planned to give any entrant in the other three events a chance to be booked for the final race up to Sunday morning. A few of the Vanderbilters have held off because they desire to get through the Saturday race before taking a chance on the Monday race.

The Pabst and Wisconsin Challenge races show only a fair-sized entry list, but both will bring out classy fields. In the Pabst, for 231 to 300 cubic inch cars, there are three Mercers, one Mason, two Falcars and a Case. Judging from past performances, the caliber of the men behind the wheels should make this a most interesting race, for Hughes and Spencer Wishart will pit themselves against Mortimer Roberts, Hastings and Trussel, Ed Pullen of their own camp, and Joe Jagersberger, who intends to come back after being out of the speed game for nearly a year, and with one good leg, at that. The other limb he lost at Columbia, S. C., last November in a bad spill on a dirt track only a short time before the international races at Savannah. If the Flying Dutchman cannot stand the 220-mile gaff, Louis Disbrow or Joe Nikrent will help him out, with Bill Endicott as a third substitute in case of emergency.

The Wisconsin Challenge, a 173-mile contest for the little fellows of 161 to 300 cubic inches, will be a three-cornered fight involving the Ford, E-M-F and Mason. It is likely this event will be a duel between Frank Kulick and Harry Endicott, as the other three drivers, Cramer and Roy Snyder of the Mason team and John Heber of the E-M-F, are lesser lights. Heber is a Milwaukee man and will drive a Milwaukee-owned car, an E-M-F of the type used by Frank Witt in all of his races, the property of Dr. Irving M. Fowle of Milwaukee. The doctor bought the car only a few days ago and after looking high and low for a competent driver, he found Heber, who has done a lot of track work in Buicks, but is now on the road.

Lineup of the Vanderbilt

The line-up in the Vanderbilt will be similar to that in the Elgin trophy, although there will be seen at Milwaukee such stars as Teddy Tetzlaff, holder of the world's road racing record for average speed, and Louis Disbrow of the Case racing outfit. The list includes de Palma, Mulford, Hughes, Wishart, Merz, Anderson, Clark, Trussel and Hastings. In addition there is a newcomer in the big road racing game, Harry Nelson of Milwaukee, who will drive the big blue Lozier of Richard H. Knowles of Milwaukee, a wealthy sportsman who tore up a fine touring car

NORTH FOND DU LAC LEG OF MILWAUKEE COURSE AFTER OILING

Milwaukee Race Entries

VANDERBILT CUP

298.5 miles, or 38 laps

No.	Car	Driver	Bore	Stroke
21	Mercer	Pullen	4.39	5
22	Mercedes	De Palma	5.2	7.07
23	Mercer	Hughes	4⅜	5
24	Knox six	Mulford	4¾	5½
25	Lozier six	Nelson	4⅝	5½
26	Mercer	Wishart	4.39	5
27	Stutz	Anderson	4¾	5½
28	Mercedes	Clark	5⅛	7½
29	Fiat 70	Tetzlaff	5⅞	7½

PABST BLUE RIBBON TROPHY

220.6 miles, or 28 laps

No.	Car	Driver	Bore	Stroke
11	Case	Nikrent	4⅝	5
12	Bergdoll	Rooney	..	..
14	Mercer	Wishart	4.39	5
15	Falcar	not named	4⅛	5¼
16	Mason	M. Roberts	3⅞	5
17	Mercer	Pullen	4⅜	5
18	Falcar	Not named	4⅛	5¼
19	Mercer	Hughes	4⅜	5

GRAND PRIX

409.86 miles or 52 laps

No.	Car	Driver	Bore	Stroke
31	Benz	Burman	..	..
32	Lozier	Nelson	4⅝	5½
33	Fiat	Tetzlaff	5⅞	7½
34	Mercer	Hughes	4⅜	5
35	Mercedes	De Palma	5.2	7.06
36	Mercedes	Wishart	5.2	7.06
37	Fiat	Bruce-Brown	5.9	7.87
38	Knox six	Mulford	4¾	5½
39	Mercedes	Clark	5.2	7.06
40	Benz	Bergdoll	6.2	6.3
41	Fiat	Bragg	5⅛	7½
42	Benz	Horan	..	..

WISCONSIN CHALLENGE TROPHY

173.4 miles, or 22 laps

No.	Car	Driver	Bore	Stroke
1	Ford	Kulick	3¾	4
2	Mason	R. Snyder	3⅞	5
3	Mason	G. Mason	3⅞	5
4	E. M. F.	J. Heber	4	4½
5	Mason	H. Endicott	3 13-16	5

to make a mount that would give the Cream City at least one representative in the races. Nelson has been in the racing game on a more or less local scale for 5 or 6 years, but looks as if he had the goods and may surprise the dopesters.

First Practice on Course

Milwaukee, Wis., Sept. 17—After an all-night rain and under skies still murky and threatening, the contestants in the four international road races were given the word to take the 7.882 mile course in the town of Wauwatosa at 11 o'clock this morning. No one excepting the indomitable de Palma attempted anything like record speed, as the roads were pretty well soaked up by the rainfalls of Saturday night and Monday night. There remained to be oiled on Saturday night a stretch of about ½ mile on the North Fondy road and the entire home stretch on Burleigh street, and the rain precluded all possibility of putting on the grease before the surface has dried out to a considerable extent.

The timer was not in working order until the practice hours were nearly over, and only a few of the cars were officially timed by the electrical device. In fact, the de Palma lap of 7:15 is the only real official time given out.

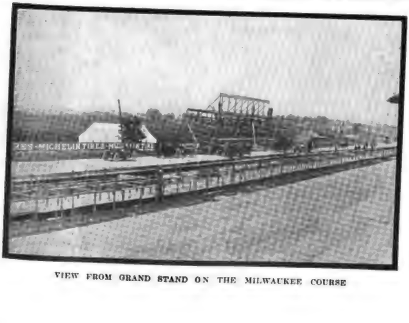
It was announced today that Joe Nikrent would pilot the Case entry in the Pabst instead of Joe Jagersberger. The Case officials fear that the Dutchman will not be able to stand the pace, as he has not competed in a race since losing his right leg at Columbia, S. C., a year ago, and is not in the best of physical condition.

Joe Horan will drive the third Benz in the grand prix instead of Joe Dawson, who it was thought would be reinstated by the A. A. A. contest board in time to compete at Milwaukee. The chances are so slim that he will be put in good standing that the Benz people nominated Horan.

Starter Wagner announced to the drivers today that hereafter they would be given double time for practice. The scheduled hours were from 11 to 1 o'clock daily, one hour being given the little fellows and another hour to the grand prix and Vanderbilt cars. Beginning Wednesday, the practice time will start at 11 o'clock and end at 3 o'clock.

GETTING READY FOR DESERT RACE

Phoenix, Ariz., Sept. 16—Two cars, a Cadillac and a National, already are entered in the fifth Los Angeles-Phœnix road race, which is to start from the Hollenbeck hotel, Los Angeles, at 12 o'clock on the night of October 26. It is expected that fifteen or sixteen will take part this year. Reports are in circulation that a Simplex, a Fiat, an Isotta-Fraschini and several other high-powered machines will engage in the long desert struggle.



VIEW FROM GRAND STAND ON THE MILWAUKEE COURSE

SPEED SHOWN IN OSTEND MEET

Ostend, Sept. 6—Christiaens, driving the 4.3 by 6.2 inch six-cylinder grand prix racer made the fastest time at the annual Ostend meeting. His average time for the flying kilometer run in two directions was 22 seconds, being at the rate of 101.8 miles an hour. The faster of the two runs was made in 20 seconds, being equal to 111.8 miles an hour. In the 20 kilometers race, Christiaens' time was 9 minutes 25⅖ seconds, being equal to a pace of about 78 miles an hour.

The second best time on the 20 kilometers—12.4 miles-course was put up by the amateur driver, Lacon, in a Gregoire of 3.1 by 6.2 inches bore and stroke, time, 11:26⅕. He was followed by Hautvast in a Sava in 12:05⅕, and by a Hispano-Suiza in 12:14⅗. After the big Excelsior Lacon's Gregoire was the fastest on the flying kilometer, its average for the two runs being :31; Berger on Sava occupied :35⅖, and Hautvast in same make :37⅕. Lacon's Gregoire covered the kilometer with a standing start in :45⅘ on the outward run and :45⅗ on the return trip. This year's meeting brought out fewer competitors than on previous occasions.

NEW 12-HOUR CLASS RECORD

London, Sept. 7—On Brooklands track a 15.9-horsepower Star, with a 3.14-inch bore and 5.9-inch stroke, covered 801 miles 1,513 yards in 12 hours, which is a record for its class. During the trial the car made three stops, totaling 5 minutes 27 seconds, for gasoline and oil. The front tires went through without change, while the rears were changed once as a precautionary measure. Following the speed trial, the car, carrying a 1,000-pound load, climbed the test hill at Brooklands from a standing start, the hill having a gradient of 1 in 4.

PEUGEOTS AND SUNBEAMS ENTER

Paris, Sept. 6—Six cars are at present entered for the French grand prix race to be held about the end of June, 1913. The firms are the Peugeot company with three cars and the Sunbeam Motor Car Co., of Wolverhampton, also with three models. Entries for this race close on the last day of October, when a minimum of forty cars must have been enrolled for the event to be held.

OLDFIELD TURNS FAST MILE

Cleveland, O., Sept. 14—Racing on the dirt track at North Randall today, Barney Oldfield in the Christie came within a hair of beating Bob Burman's Brighton Beach mile record of :47.85. In his first trial Oldfield cut the local track mark from :53⅗ to :49.93. Then Disbrow cut this to :49.35. Following this Oldfield made the circuit in :47.91.

Developments in United Motors' Case

Two Courses Open to Company—First One Is Reorganization, Taking Care of Creditors and Keeping Enough Capital With Which to Work—Other Is Sale of Plants

NEW YORK, Sept. 17—The situation of the United States Motor Co., which was put into the receivers' hands last Wednesday, so far as reorganization is concerned is developing slowly. There are two classes of creditors and each class is susceptible to division into several subordinate headings. The real question of reorganization undoubtedly will turn on the agreement or disagreement of the creditors as to participation. Summarized, the liabilities of the company may be divided as follows: Due to banks, $4,200,000; due to merchants, $2,000,000; due on debentures, $6,000,000; total, $12,200,000.

The total indebtedness is divided into two classes, the first of which is represented by commercial paper bearing two endorsements. The other class has paper with only one endorsement. As an instance, it may be cited that the debentures bear only the signature of the parent company. Another example of the one-signature paper is where one of the constituent companies of United States Motor Co. issued a note to secure payment for money advanced or goods purchased for its use.

The two-signature paper consists of notes issued by the parent company and endorsed by one of the constituent units, or that issued by the constituent company and endorsed by the parent organization. Practically all of the claims of the merchandise creditors are more or less of the one-signature paper.

In case agreement among the interested parties cannot be reached as to the status of the different grades of paper, the matter undoubtedly will come within the view of the court for definite construction of the claims of each side. At present the single major question that must be settled is with regard to agreement among the creditors themselves.

Two Courses Are Open

Under the receivership action there are two courses open to the company. The first is reorganization under some plan that will take care of the creditors and allow the company sufficient working capital to manufacture and sell its product. The other is a sale under order of the court.

Regarding the first course it may be said that the company requires about $5,000,000 additional capital with which to satisfy the claims and to furnish working capital. This may be raised in two ways, the one by assessment of the present stock and the other by the sale of additional securities either to the present creditors in payment of their claims or on the open market. In the latter case the proceeds could be used to take up the paper.

Committee Working on Plans

The committee which is formulating plans for reorganization has not finished its draughting of the proposed plan. Anything that has been said so far about the amount of the assessment or the method proposed for levying it, is branded as premature by the committee. Nevertheless, the report has been circulated throughout the industry and in the financial district that the favored plan is for an assessment of from $20 to $25.

According to recent statements coming from the United States Motor Co. and the brokers who have made a specialty of handling its stock issues in the market, fully half of the stock of the company is alleged to be held by the following list of stockholders: Anthony N. Brady, James C. Brady, J. S. Bache, Caroline W. Astor, Benjamin Briscoe, Samuel P. Colt, Frank Briscoe, H. Holbrook Curtis, Eugene Meyers, Jr., Thomas F. Ryan, Herbert L. Satterlee, Harry Payne Whitney, Richard Irvin, John Jacob Astor's estate and Charles G. Stoddard.

If the holdings of this group represent half the outstanding stock, they would be required to put up $2,300,000 on a basis of $20 a share. The complete amount that could be raised would be about $4,600,000. If the rate of assessment was $25 a share the total proceeds would be $5,750,000. The latter amount would be sufficient, in the opinion of those most intimately connected with the company, to place it on a sound footing. Naturally, there may be some difficulty in executing such a plan as was prematurely announced.

The alternative proposition of issuing new securities for sale on the market or in payment of creditors, involves a court adjustment as a condition precedent, or a continuance of the company as at present, depending upon the terms of agreement.

The holders of the two-signature paper feel they have some claim to seniority, but that claim is sharply at issue with the position taken by the holders of the one-signature paper. They insist that if there is to be another stock issue that a certain proportion of cash shall be paid to them. The smaller faction among the creditors are unwilling to take that view of the situation unless the same terms apply to them as well.

If no agreement is reached before the court sale, there are still several plans that may be followed to reach a reorganization. The assets may be bid in by a purchaser at auction; composition of the debts might be accomplished on a variety of bases, or in the last analysis the individual assets of the company might be disposed of on the block. Nobody in the trade looks for the dissolution of the company piecemeal as the result of the present action.

Some form of reorganization is the only result that is seriously considered, but what it will be depends on a multitude of factors.

W. F. S. Strong and Roberts Walker, who were named receivers for the United States Motor Co., also have been named as ancillary receivers in each of the states where the company operated manufacturing plants. There are about forty selling companies, located in various cities and states, all of which belong to the parent company by stock ownership or otherwise, and the question of ancillary receivership in all those states is being considered at present.

Providence Engine Co. Involved

The Providence Engine Co., manufacturer of steam engines and motor car parts—specifically running gears, crank shafts and machined parts—has been petitioned in involuntary bankruptcy on behalf of local creditors at Providence. The company is owned through its stock issues by the United States Motor Co. The preliminary hearing of the matter is set for Wednesday in the United States district court at Providence, and if the matter takes its usual course, Messrs. Strong and Walker will be named as receivers.

As an individual corporation, the Providence company is said to be in excellent financial shape.

At the time Judge Charles M. Hough received the bill of complaint filed on behalf of the Brown & Sharpe Mfg. Co., which resulted in the receivership, he noted the fact that the main questions involved in the bankruptcy action would require the utmost care in unraveling.

The court commented on the fact that the problems presented in the bill of complaint were exceedingly complex, and charged the receivers to use great pains in reaching the exact facts. Hence, all the official statements made to the public have been couched in what might be termed glittering generalities.

No schedules of assets and liabilities have been filed so far, but work is being done on their preparation. The banking debts of the embarrassed company amount to about $4,200,000, and, as is well-known, the Central Trust Co. figures as the heaviest creditor. But the mere fact that it heads the list with claims of about $1,400,000 does not mean that it stands to lose that amount, because each

of the aggregate amounts owing to the various creditors may represent a large proportion of paper bearing two signatures, worth approximately its face value. Thus the lists of creditors that have been published fail to tell the real story because they do not show the equities applying to any case.

In the specific case of the Central Trust Co., the proportion of two-signature paper involved is very high, and the same might be said for other banking creditors who required the endorsement of one of the solvent constituent companies on the paper of the parent company, or vice versa, before entertaining it as a discount proposition.

Plants Continue Operations

The largest merchandise creditors also adopted this precaution to a considerable extent, and while the concerns that head the list appear to be involved for material sums, the actual fact is that they are protected almost as well as the bankers.

Except the Brush Runabout Co., all the manufacturing plants of the United States Motor Co. continue in operation to about the extent that they have for the past 90 days. The receivers obtained an order of court to advance money for the payrolls of the various plants from the general funds of the company and to make provision for administration.

There is little activity, however, in any of the plants, and there has been much less since the last of the 1912 product was completed and marketed.

In last week's issue a citation from the report made by Percy Martin on the various companies stated that, in Mr. Martin's opinion, the greatest necessity prevailed for active operation of the plants, so that their organizations might be retained and preserved. Now it is stated by those most closely allied with the project of reorganization that the arrangements will have to be made with the utmost speed in order to protect all the interests.

TWO CONCERNS CHANGE NAME

Detroit, Mich., Sept. 18—In the ever-changing motor car industry two changes of name were recorded last week. The Everitt Motor Car Co., of Detroit, maker of the Everitt cars, was made the Flanders Motor Co., and henceforth the product of the factory will be known as Flanders cars. It was only about 3 months ago that the name of Everitt was given to the concern, which originally was known as the Metzger Motor Car Co.

A consistent change also is reported from Jackson, in that the Clarke-Carter Automobile Co. has announced that henceforth it will be known as the Cutting Motor Car Co. It will continue to make cars under the trade name of Cutting.

Thomas One of the United Motors' Units

Mystery as to Real Ownership of Concern Cleared Up by Statement Big Holding Company Secretly Acquired Nearly All Stock in Buffalo Plant—No Reorganization Plans

NEW YORK, Sept. 17—The relations of the United States Motor Co. with the E. R. Thomas Motor Co. of Buffalo have been shrouded in more or less mystery for over a year. The facts in the case are that the United States Motor Co. acquired practically the whole of the Thomas stock about a year ago, exchanging its own securities for the certificates of the Buffalo company and furnishing some other consideration. The ownership of the Thomas company was kept a sort of state secret and officially it was denied repeatedly by officers of the United States Motor Co. during the past year.

The Thomas company went into the hands of a receiver last month after F. R. Humpage, president at that time, failed to exercise an option to purchase the company from the United States Motor Co. The reason for the failure of Mr. Humpage to take over the Thomas was that he was unable to float his new securities in the condition of the money market or could not obtain the services of an underwriting house to handle the transaction.

The capitalization of the Thomas company is $2,400,000, of which $400,000 is 7 per cent cumulative preferred. The remainder is common. There is no bonded debt. It is understood that Mr. Humpage succeeded in getting all the support required except $400,000.

As the Thomas company is now in bankruptcy court, the matter of considering it as in any way affecting the affairs of the United States Motor Co. has not been pressed.

E. R. Thomas, founder of the company, is a creditor to a material amount. Summed up in a few words, the United States Motor Co. affairs appear about as follows: No plan of reorganization has been formulated and adopted so far. Until such plan is agreed upon, there will be nothing to present to any underwriter. The terms of the agreement will be arranged as quickly as possible, as all the factors in the problem read so that if anything is to be done it must be done without undue loss of time.

NYBERG MAY MOVE PLANT

Indianapolis, Ind., Sept. 16—Henry Nyberg, president of the Nyberg Motor Works, Anderson, has confirmed a report that the company is negotiating for a factory site in this city, with a view to moving its manufacturing plant to Indianapolis. The company manufactures the Nyberg line of pleasure and commercial cars.

Since locating in Anderson some time ago, the company has found the need for expansion, not possible in its present location. For several days negotiations have been under way for a site here. It is understood several prospective sites have been visited and are under consideration. It is thought the company may locate in Speedway, the horseless city.

MARQUETTE CAR DISCONTINUED

Detroit, Mich., Sept. 17—The manufacture of Marquette motor cars has been discontinued, the factory of the Marquette company at Saginaw, Mich., which is a subsidiary to the General Motors Co., having been closed down. As yet no disposition of the machinery and stock at Saginaw has been made, and it has not been definitely decided just what will be done with it. The factory, however, will make up spare parts enough for 5 years ahead, so owners of Marquettes will not be hampered in getting replacements.

The Marquette interests are to be merged with those of the Olds Motor Works at Lansing, and as most of the Marquette cars which were on hand have been sold, there will be no trouble in making the change.

OAKLAND ENTERTAINS AGENTS

Detroit, Mich., Sept. 17—The Oakland Motor Car Co. entertained 125 branch managers, distributors and representatives at the factory last week. A banquet was tendered the visitors on Saturday evening at the Pontchartrain, while in the afternoon the factory was inspected and plans for the coming season were discussed.

OAKLAND FACTORY MANAGER KILLED

Detroit, Mich., Sept. 16—T. W. Wilson, factory manager of the Oakland Motor Car Co., was killed early Sunday morning on the White Lake road 2 miles west of Pontiac, Mich., when the car which he was driving turned turtle, pinning him underneath and suffocating him from the gasoline fumes. Mr. Wilson, who was accompanied by his brother-in-law, who was seriously injured, and his nephew, who was unhurt, was returning to his cottage at Watkins Lake after the banquet which the Oakland company tendered its visiting dealers and agents at the Pontchartrain hotel in Detroit.

TREGO GOES WITH PACKARD

Buffalo, N. Y., Sept. 16—Frank H. Trego, who resigned on September 1, as chief engineer of the E. R. Thomas Motor Car Co., has accepted the position of manager of the research engineering department of the Packard Motor Car Co., Detroit.

Abstract. Ecologists have long been interested in the relationship between species richness and ecosystem function, but most research has focused on the effects of species richness per se, rather than on the effects of species identity. Recent research has shown that species identity can have strong effects on ecosystem function, but it remains unclear how species identity effects are related to species richness effects. We used a meta-analysis to compare the effects of species richness and species identity on ecosystem function in terrestrial plant communities. We found that species identity effects were generally stronger than species richness effects, but that species richness effects were more consistent than species identity effects. We also found that species identity effects were more variable when species richness was low, and that species richness effects were more variable when species identity was low. These results suggest that species identity effects are more important than species richness effects in determining ecosystem function, but that species richness effects are more consistent than species identity effects. We discuss the implications of these results for the study of biodiversity and ecosystem function.

Key words: biodiversity; ecosystem function; meta-analysis; species identity; species richness.

Introduction

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Illinois Ready for Good Roads Rally

BLOOMINGTON, Ill., Sept. 17.—Eugene D. Funk, of Bloomington, will lead a large delegation from this city and vicinity to the first annual convention of the Illinois Highway Improvement Association which opens at Peoria on Friday, September 27. The gathering will discuss the proper course of action in inducing the state legislature to favor the construction of a series of state highways or trunk lines of hard roads, using the money which has accumulated from the sale of motor car licenses. Strong pressure will be brought upon the general assembly to divide this money among the counties of the state, giving each township the pitiful sum of $300. As there as 1,600 townships in the state, the equable distribution of the fund would give each an insignificant allotment, absolutely useless for the purpose intended. The association has been advised, however, that the rural sentiment is strongly in favor of such an absurd distribution and it will require hard work to educate the legislature and the public generally concerning the views of the trunk line promoters.

The leading spirits in the improvement association also realize that the rivalry between the various sections of the state in securing these proposed state roads, may lead to ill feeling and jealousy. As it is impossible to construct all of these trunk lines at the same time, each section naturally is anxious to be the first to receive attention. Those unsuccessful may seriously menace the plans affecting the other locations and it is important to secure harmony and co-operation.

The plan now proposed and which will probably meet with favor, provides for a drawing. After the engineers make a report upon the most desirable routes between Chicago and St. Louis; between Freeport and Cairo; between Danville and Quincy, and other cross states lines thought feasible, it is proposed that the five or six roads be selected by lot, the one drawn first to be given attention first, and the others started after the first has been finished. This would be fair to all and would probably have the effect of dissipating any sectional rivalry or feeling.

The association will recommend that when the first road to be built has been selected, that the legislature appropriate all of the money in the license fund for the construction of this particular road, and appropriate an equal sum from the state treasury to apply upon the same improvement. When the first trunk line is completed, it is proposed to draw by lot for the second, and when chosen, repeat the performance. It may require 10 to 15 years to complete the chain of state roads but when finished, they will be of a quality to reflect credit upon the commonwealth.

Peoria Meeting Will Discuss How to Spend Registration Money

The convention of next week in Peoria will afford the means for such public expression. Representative men and women will discuss the subject from all standpoints.

TO SUBSIDIZE GUATEMALA ROADS

Guatemala City, Sept. 13—Action on the part of the federal government offering generous subsidies to any of the state or district authorities for the construction of roads will have a decided effect on motor imports. No roads to be subsidized are to be built until the plans are approved by government engineers and no plan will be approved unless the roadway is to be constructed sufficiently well to permit the use of motor cars. The successful use of motor cars in several sections of the republic has proven that great stimulus can be given many industries by the extension of such lines. This is especially true in the coffee districts where this method of haulage has proven most efficient. There are many isolated sections of the country not producing sufficient tonnage to justify the building of railroads but as the cost of ordinary roadways is so much less and they can be kept up with little expense the districts can be developed by the use of motor trucks.

Coming Motor Events

September 14-21—Annual fall show; Chicago Automobile Trade Association.
*September 20—Wisconsin challenge and Pabst Trophy races; Milwaukee, Wis.
*September 21—Vanderbilt road race; Milwaukee, Wis.
September 23—Grand Prix; Milwaukee, Wis.
September 17-20—Fire engineers' convention; International Association Fire Engineers, Denver, Colo.
September 25-October 6—Agricultural Exhibition and Plowing Matches, Bourges.
September 30-October 5—American Road Congress; Atlantic City.
September—Track meet; Universal Exposition Co., St. Louis, Mo.
October 4-5—Track meet; Sioux City Auto Club, Sioux City, Iowa.
October 5—Fifth annual run of St. Louis Automobile Club; St. Louis, Mo.
October 6—Gallion hill climb.
*October 7—National tour Detroit to New Orleans; American Automobile Association.
October 8—National convention of Electric Vehicle Association of America; Boston Mass.
October 12—Track meet; Rockingham park, Salem, N. H.
October 21—Chicago Motor Club reliability.
October 26—Los Angeles to Phoenix Road Race.
November 2-3—Splash guard competition; Versailles.
November 6—Track meet; Shreveport Automobile Club, Shreveport, La.

*Sanctioned by A. A. A.

SHOWS.

September 23-Oct. 3—Rubber show, Grand Central palace, New York.
September 26-Oct. 6—Exposition agricultural motor cars, Bourges, France.
October 2-12—Fire show, Madison Square Garden, New York.
October 7-12—St. Louis show.
November 8-16—Olympic show; overflow November 22-30 Agricultural Hall.
December 7-22—Paris salon.
January 6-11, 1913—Cleveland show.
January 4-11—Montreal show.
January 11-18—New York pleasure car show; Automobile Board of Trade; Madison Square Garden and Grand Central Palace.
January 11-22—Brussels, Belgium, show, Centenary Palace.
January 20-26—New York truck show; Automobile Board of Trade; Grand Central Palace and Madison Square Garden.
January 20-25—Philadelphia show.
January 25-February 1—Montreal, Canada, show.
January 27-February 1—Detroit show.
February 1-8—Chicago show.
February 10-15—Chicago Truck show.
February 10-15—Minneapolis show.
February 17-22—Kansas City show.
February 24-March 1—Show at Omaha, Neb.
March 3-8—Pittsburgh show.
March 8-15—Boston pleasure car show.
March 17-22—Buffalo show.
March 19-29—Boston truck show.
March 24-29—Indianapolis show.

RECOMMENDATIONS FOR CHICAGO

Chicago, Sept. 16—That Chicago is far behind the times in the matter of fire-fighting equipment for a city of its size is admitted, particularly as regards the method of propelling the apparatus. The need for a more extended motorization of equipment is emphasized by the recommendations of the National Board of Fire Underwriters, embodied in the recent report o fthe committees on fire prevention of that body.

This report is the result of a thorough investigation of the fire-fighting facilities of the city from March to June of this year, and the suggestions for the betterment of the service are quite comprehensive. Among those upon which most stress is laid are the recommendations for more extensive use of motor equipment to replace the horse-drawn apparatus in the city of Chicago.

The report of the National Board of Fire Underwriters urges that the chemical service be improved by the installation of additional motor-driven combination hose wagons or ladder trucks, so that two pieces of apparatus carrying large chemical tanks will be included in the first alarm assignments, and the use of separate horse-drawn chemical engines be discontinued; the motorized combination hose wagons to have divided bodies, with a capacity of at least 1,000 feet of hose, the speed of 30 miles per hour.

It is further urged that when the proposed high-pressure systems are installed, at least two-thirds of the engine companies in and close to the districts covered by such systems be equipped with motor-driven hose wagons carrying 2,000 feet of hose and a turret pipe; specifications for motor-driven fire engines to require pumps to deliver 700 gallons per minute at 120 pounds' net water pressure. The report is interesting.

Only Two Cars Perfect in Buffalo Run

Field a Small One But Contest Proves to Be Interesting

MAXWELL WHICH FINISHED BUFFALO RELIABILITY WITH PERFECT SCORE
WARREN-DETROIT THAT TIED MAXWELL IN BUFFALO RUN

BUFFALO, N. Y., Sept. 16—In the third annual 800-mile reliability tour of the Automobile Club of Buffalo which finished Saturday night at 6 o'clock, two cars completed the 4 days' grind with clean scores, the Warren-Detroit car entered by the Poppenberg Motor Car Co., of Buffalo, and the No. 25 Maxwell, driven by A. G. Schoenthal.

The winner of division 2 was the No. 25 Maxwell, runabout class, with No. 16 Paige-Detroit, second, and No. 9 Kirt, third. In division 3, runabout class, the No. 19 Warren-Detroit was the winner with the No. 7 Maxwell, second. The winner in division 2, touring car class, was the No. 8 Hupmobile, with No. 22 R. C. H., second.

Charles F. Monroe of the Monroe Motor Car Co., which concern entered the No. 25 Maxwell, and the Poppenberg Motor Co., which entered the No. 19 Warren, have filed a protest with Referee Kreinheder in the matter of who is entitled to the Laurens Enos and Vars trophies. Before rendering his decision Referee Kreinheder will communicate with the contest board of the American Automobile Association at New York city and he expects to announce the winners of the trophies on Friday night.

The run just completed covered 838 miles and was filled with thrilling incidents. The contesting cars, nine in number, headed by the pilot car, a Studebaker 30, with George Crist, driver, the pacemaker and referee's car, Premier, Ray MacNamara, driver, and the chairman's car, Pierce-Arrow, with Charles A. Pond at the wheel, started at 5:30 o'clock on Wednesday morning from the city of Buffalo.

The rules of the contest were to the effect that penalties would be imposed for taking on gasoline, oil or water short of 100 miles of travel; for late arrivals at noon controls, and for all repairing done on the machines. No penalties were to be imposed on work done on tires with the motor in operation but time consumed on tire repairing was to be added to running time of cars.

The contestants covered 210 miles on the first day and the performances of the various cars was highly creditable, although heavy rains were encountered all the way to Smethport, Pa., which was the noon control.

A slight accident marred the second day's run, when the McFarlan six overturned between Ripley and Findlay Lake, a distance of 75 miles from Buffalo. Although the occupants of the car including the driver, Winfield Graham, escaped with slight bruises, for a time it looked as if the car was out of the contest for the balance of the day, but the car was righted and the motor resumed operation in about 1 minute and the car finished the run only 10 points being chalked against it for the accident.

The second day's run was marked by fine weather and considerable beautiful scenery and the roads were fine.

On the third day the chairman's car containing driver, Charles Pond, and Orson E. Yeager, chairman, had a narrow escape from plunging through a bridge. The driver observed several loose planks on the bridge but it was impossible to stop the car in time and the driver had one alternative, either to crash into the bridge or apply the brakes and go into the stream. Luckily he chose the latter course. The car splashed into a creek but fortunately it had a substantial foundation. However, the occupants were badly shaken up, but no one was injured save receiving minor bruises. It was decided to make the best

RESULTS IN RELIABILITY RUN OF AUTOMOBILE CLUB OF BUFFALO

No.	Car	Driver	Division	Hour	1st Day		2d Day		3d Day		4th Day				Total Penalties
					Time	Work	Time	Work	Time	Work	Time	Work	Time	Work	
7	Maxwell	G. M. Wolf	3	18	0	4	0	0	0	0	0	0	0	4	4
8	Hupmobile	C. Almondinger	2	18	0	6	0	0	0	0	0	0	0	6	6
9	Krit	R. Langham	2	18	0	0	0	0	0	0	0	37	0	37	37
10	McFarlan six	W. Graham	5	20	0	0	0	10	0	16	52	98	52	124	176
16	Paige-Detroit	B. Malcolm	2	18	0	0	0	3	0	0	0	0	0	3	3
19	Warren-Detroit	H. Holcombe	3	18	0	0	0	0	0	0	0	0	0	0	0
22	R. C. H.	W. Schroeder	2	18	0	3	0	3	0	3	0	0	0	9	9
25	Maxwell	A. Schoenthal	2	18	0	0	0	0	0	0	0	0	0	0	0
31	Amplex	Barclay-Stains	7	20	0	0	0	0	0	0	Withdrawn				

Maxwell and Warren-Detroit in the Tie

New York Affair a 4-Day Run Over All Sorts of Roads

of the situation and the stream was forded. All contesting cars splashed through the stream and reached the noon control at Canandaigua on schedule time.

On the concluding day of the tour 198 miles were made among steep winding hills and long stretches of rough dirt roads. In climbing Clarksburg hill, which elevation has twelve short deep turns in a mile and a quarter, great difficulty was experienced owing to depressions and soft earth The pilot Studebaker lost 20 minutes in making this climb and the soft earth in the narrow road pressed into a rut made climbing of the hill dangerous. The noon control at North Java was reached on schedule owing to there being no broken bridges or railroad crossings. The return trip was made over bad roads, making progress slow.

PICTURESQUE SCENE ON BUFFALO RELIABILITY—PAIGE-DETROIT CROSSING RUSTIC BRIDGE IN VICINITY OF BUFFALO

CHICAGO PATHFINDERS ON TRAIL

Chicago, Sept. 16—John G. De Long is out in a pathfinding Velie blazing a trail for the Chicago Motor Club's sensational reliability run around Lake Michigan which is scheduled for starting October 21. It is figured that the total distance will be something like 1,050 miles, with the night stops at Oshkosh, Escanaba, St. Ignace, Traverse City and Grand Rapids. Enthusiasm over the contest runs high and already there are entered a Chalmers, two Velies, two Stutzes, a Falcar and a Briggs-Detroiter.

COLORING NEW YORK ROUTES

Albany, N. Y., Sept. 16—Acting upon the recent suggestion of Frank D. Lyon, secretary of the New York State Automobile Association, Superintendent Reel, highway department, officially designated on Saturday the main highway routes of the Empire state by colors for convenience of motorists.

Five routes have been designated—red, blue, yellow, green, brown. Coloring of the routes will begin at once. Fences and approaches along the routes will be painted by the highway department and telegraph poles will be banded in colors by local motor clubs. Colored disks will designate routes through towns, and maps will be prepared showing the color scheme. These colors will be used on following routes:

Blue—New York to Buffalo via Poughkeepsie, Albany, Schenectady, Utica, Syracuse, thence by two branches, one through Rochester, the other through Auburn and Geneva to LeRoy, to Buffalo.

Red—New York to Jamestown, to be known as overland trail as blazed by the A. A. A. to the west along the southern tier. It will go through Nyack, Goshen, Middletown, Binghamton, Elmira, Hornell, Olean, Salamanca, and Jamestown and thence west.

Yellow—New York to Canadian border and return, skirting the Adirondack mountains. This route goes northward through Mount Vernon, White Plains, Dover Plains, Chatham, Valatie, Troy, Eagle Bridge, Salem, Middle Granville, Ticonderoga, Westport, Elizabethtown, Lake Placid, Saranac Lake, Paul Smiths, to Malone, thence to Ogdensburg, Alexandria Bay, Watertown, Copenhagen, Boonville, Utica, Mohawk, Cooperstown, Colliers, Stamford, Arkville, Kingston, Newburgh, Nyack, and New York.

Green—Binghamton via Albany and Rouse's Point to Niagara Falls, routed through Oneonta, Albany, Saratoga Springs, Lake George, Chestertown, Schroon Lake, Elizabethtown, Keeseville, Plattsburg, Rouse's Point, Malone, Potsdam, Canton, Antwerp, Watertown, Pulaski, Oswego, Rochester, Lockport and Niagara Falls.

Brown—Oswego to Binghamton via Syracuse and Cortland.

REASONS FOR THE BUFFALO PENALIZATIONS

No. 7, Maxwell—First day, replaced terminal wire, 4 points

No. 8, Hupmobile—First day, gasoline twice, 6 points

No. 9, Krit—Fourth day, work, 37 points

No. 10, McFarlan—Second day, work, 10; third day, work, 16; fourth day, late, 52; work, 98

No. 16, Paige-Detroit—Second day, work, 3

No. 22, R. C. H.—First day, water, 3; second day, work, 3; third day, water, 3

DAMAGES GIVEN AGENT

Elmira, N. Y., Sept. 16—In the action of the Foreman Brothers Electric Co., Paducah, Ky., which concern recently went into bankruptcy, against the American Motor Sales Co. of Elmira, N. Y. for $25,000 damages for alleged breach of contract in that the Elmira motor concern refused to allow the Kentucky company to handle its cars after the insolvent condition of the latter firm was ascertained, Judge John R. Hazel, in the United States district court convening in Canandaigua, N. Y., last Saturday, directed the jury to return a verdict of $1,250 for the Kentucky corporation which amount was deposited at the time the arrangement was made. The Elmira firm consented that judgment against it be made for the amount of the deposit.

Makers Take Kindly to Carl Fisher's Idea

NEW YORK, Sept. 16—By the motor car manufacturers of Indianapolis, Ind., agreeing to subscribe in one evening last week $330,000 to the project of buying crushed rock for a transcontinental highway from New York to San Francisco, the movement for practical road construction by the motor industry has advanced one step further into the realm of the practical.

The plan of securing from each car or accessory manufacturer one-third of 1 per cent of his gross business for 3 successive years gives promise of becoming feasible. This has been demonstrated by the attitude of Indianapolis and the motor interests of that city have agreed that there is another $150,000 coming. In the first meeting all but three of the car concerns agreed to the proposition and signed the documents. The three not ready to sign are heartily in favor of the movement, but due to the holiday season could not close the matter.

Others Interested Also

The movement in the Hoosier capital has not been confined solely to manufacturers of gasoline machines, electric machines and accessories. One sporting goods house agreed to give its percentage on the sporting department of its business. Another enterprise was one department only devoted to the motor trade signed the original document. Many of the dealers were particularly anxious to enter into the proposition and become one of the many working for practical good roads.

Towards the end of last week the field of activities was centered in Detroit, where the matter was before the consideration of S. D. Waldon, R. D. Chapin and James Couzens, who are the good roads leaders of the Detroit motor industry. A meeting is scheduled for the end of this week, when it is expected something definite on Detroit's attitude will be announced. Much of the ultimate success of the movement is dependent on the attitude of Detroit, Cleveland and Buffalo, and should these three centers act in unity on the proposition there is no doubt but that America's first great road across the country will be assured.

Once the manufacturers have subscribed the necessary $10,000,000 to furnish road-building material, there is not a question but that the good roads movement will have injected into it a spirit of the practical that has up to the present been unknown in the good roads field. This action should serve as a precipitation in the entire movement, the value of which will not be confined to one transcontinental highway, but to all transcontinental highways and to highways linking the north with the south, and others in various parts of the country.

Detroit Expected to Back Up the Hoosiers in Road Scheme

S. D. Waldon, of the Packard company, recently returned from a 6,000-mile motoring trip in the western states, was wonderfully impressed with the spirit of road movement in Nevada and Wyoming, in each of which states much practical work has been done during the last year.

"There are only 100 miles of what might be designated real bad roads in the transcontinental trip west of Denver," said Mr. Walden. "There is a 20-mile stretch at Fallon in southwestern Nevada, extending from 16 miles before reaching this village and 4 miles beyond; there also is an 80-mile stretch in the region of Montello. Generally speaking, Nevada has good gravel for road construction, and while it is 340 miles across the state by the transcontinental trails, there really are but 50 miles of this bad road, this 50 being made up of the district at Fallon and a portion of that at Montello, the major part of the Montello stretch being in the state of Utah. Two-thirds of the way across Wyoming it is possible to travel at 30 or 40 miles per hour, although in parts of this state the roads are bad. The mud flats of Utah are very bad and will call for considerable energy. The garage men along the line of transcontinental highways are already wide awake to the possibilities of developing their business and today there are better garages along the transcontinental routes in these states than along many of the routes of Massachusetts. To those who have not traveled west it is almost impossible to picture the beauties of the landscape, and if the public was aware of the advantages of touring through this section on improved highways there would not be any difficulty in securing the funds for building such a roadway."

Some Favor Brick or Cement

Although the original plan of this motor highway was a stone road, many manufacturers are already talking in favor of brick or cement. The sentiment is general that a highway of this nature should be free from maintenance costs for at least 10 years, and the only road materials considered in this class would be cement and brick. It is not known exactly what materials of this nature would cost, but it is undoubtedly true that both the brick and cement interests would be quick to revise their price schedules when the opportunity for such an enormous national undertaking presented itself.

The practical spirit of do-something voiced in this latest road movement has struck a responsive chord practically from one side of the country to the other. This practical aspect of road-building stands out strongly in relief as compared with the oratorical methods so generally used up to the present. The roads movement has gone through a long educational campaign, and everybody is watching for a precipitation of the practical regime. The people owning cars today have a desire to tour over the western states before they are too old to enjoy it, and there is only one way to accomplish this and that is by some precipitation planned such as the present one.

FIRE CHIEFS MEET IN DENVER

Denver, Colo., Sept. 18—That the gasoline or electric motor has almost entirely supplanted the horse as a means of propulsion for fire-fighting equipment is emphasized more strongly than ever at the fortieth annual convention of the International Association of Fire Engineers which opened here yesterday.

For the first time in the history of fire apparatus exhibitions held in connection with these conventions there is not a single piece of horse-drawn apparatus shown at the exhibits at the Auditorium. The motor equipment has crowded out the horse.

Of $100,000 worth of motor apparatus on exhibit, the most interest among 500 fire chiefs was created by the monster Graham pump shown by the Seagrave company. It is claimed it delivers 1,000 gallons per minute at 120-pound pump pressure. It is a multiple stage centrifugal turbine pump with a 165-horsepower six cylinder motor. The needs of fire apparatus are considered by tire makers, who are showing special tires in the exhibits of Swinehart, Firestone, Republic, Goodyear, Goodrich and Fisk.

Other parts and accessories makers paying attention to needs of fire equipment are illustrated by the special axle construction of the Sheldon Axle Co. and the special Bowser storage tanks for fuel and oil in stations.

The convention opened yesterday. The chiefs were welcomed and offered the freedom of the city by Mayor Arnold. At a meeting in the afternoon a paper on the triple combination hose wagon, chemical and pumping engine by Chief Connery, New Castle, Pa., aroused great discussion, but the general opinion seemed to be that this new combination, possible only with motor drive, was valuable for smaller cities and outlying districts because almost all the equipment needed at a fire was on this one unit.

Today tests of motor pumps by the chiefs and the National Board of Fire Underwriters are in progress. Yesterday wives and families of chiefs were taken to the foothills in motor cars as guests of the Denver Motor Club.

Peugeot Makes Good Its Speed Claims

Aftermath of the Sarthe Road Races Reflects Glory on French Concern

PARIS, Sept. 9—As announced by cable in Motor Age, Jules Goux won the Sarthe grand prix 402 miles race in a Peugeot identical with the car with which his team mate, Georges Boillot, captured the grand prix at Dieppe. He averaged 73 miles an hour. The performance broke all European records for this distance and finally classed the Peugeot as the fastest long-distance racing car France has ever produced.

Incidentally, this was one of the cars which should have been sent to the American races at Elgin and Milwaukee, but at the last moment was kept back to race at Le Mans, owing to misunderstanding between the American backers and the French firm. It was fortunate that the Peugeots were kept at home, for without them the free-for-all class at Le Mans would have been a hollow event. Wagner's Fiat, which was to have been driven by an amateur, failed to turn up; Christiaens had not applied for insurance in time and could not start his Excelsior; De Lange's 4-year-old Darracq was unaccounted for. This left the two Peugeots, belonging to Goux and Boillot, a Crespelle with long-stroke single-cylinder de Dion motor and practically a stripped touring model Spa, driven by Leduc. As the Peugeots could walk around their rivals, there was an entire absence of competition in this class; nevertheless, in view of their reputation, they were in honor bound to maintain a fast pace, and they maintained it.

Boillot Makes Race a Joke

Boillot, who had started last, came in at the end of his first round for a tire. He took a spare and went away with a grin—a sure sign that it was not a real race so far as he was concerned. At Dieppe it was too serious to admit of even a suspicion of a smile. At the end of a second round he pulled in for another tire. After a third round he took a wheel in place of one that had shed its tire. After the fourth round he stopped again, crawled under his car to look at the universal housing, peeped at his motor, and went on. On the fifth he made the record of the race—35.55 miles in 25 minutes 9 seconds, including a stop for a tire—being equal to 79.9 miles an hour. Making a deduction for the stop the average speed for the round was about 85 miles an hour.

Later he was brought in by Duray's Alcyon, still wearing the happy smile, which at once destroyed the report that he had killed a spectator and confirmed the impression that the race was not of supreme importance so far as he was concerned. His accident was not altogether unexpected and was irreparable. One of the bolts holding the exhaust manifold had broken; a repair was effected at the last minute, but as the bolt went through the waterjacket a leak was feared. It was after the fast round that the water began to get away, finding a passage into the crankchamber and the oil reservoir and suddenly causing the complete seizure of the engine.

With Boillot out ,it remained for Goux to maintain the Peugeot fame. He did it by covering the twelve rounds with nothing more than three punctures and a stop at half time to fill his tanks. His fastest round was his third, covered in 25:16. Leduc's Spa, obviously no match for the Peugeot, ran around at a creditable speed without any incident of note, coming in 80 minutes after the winner. The 3-year-old Crespelle had a series of little troubles which succeeded in putting it out of the running at three-quarter distance.

Course Slower Than Dieppe

In the opinion of all the drivers this course was not as fast as that at Dieppe. It was practically flat, or with long straight gradients of about ¼ per cent on which it was impossible to get up the highest speeds. At Dieppe, on the other hand, there were some exceptionally long switchback sweeps giving maximums of 125 miles an hour.

The competition lacking in the big class was provided in the 3-liter section. The two sets of cars were run together, the small ones going away first at intervals of 1 minute and the big ones after. Lion-Peugeot, Alcyon, Schneider, Vinot-Deguingand, Hispano-Suiza, Crespelle, Cote, Picker and Koecklin were the firms represented. Thomas, in a Lion Peugeot, set a fast pace, coming round to the stands before Boillot had got away, and maintaining an average of 70 miles an hour, a really fine performance for a car of 3.07 by 6.14 inches bore and stroke.

After his fast initial round Thomas disappeared; Zuccarelli took his place, with Barriaux and Duray, both in Alcyons, hard after him, and the two Vinots pressing the Alcyons close. The Schneiders were further down the list, but going well. After three rounds Zuccarelli with the small Lion-Peugeot had got ahead of Boillot with the big Peugeot and had a lead of more than 4 minutes on Barriaux, the nearest rival in his own class. Champoiseau of the Schneider firm had pulled in ahead of the Vinots and Croquet, another Schneider man, was just to the rear of the Vinots.

At half distance six cars were closely bunched, the intervals between them varying from a few seconds to 6 minutes. On the seventh round Duray began to have trouble with the valve springs of his Alcyon and realizing that the race was finished as far as he was concerned, stopped to bring Boillot home on his car.

At this time the greatest excitement of the race was felt. Zuccarelli was being dangerously pressed by Barriaux in the Alcyon; the Vinots were running the Alcyons close and Champoiseau and Croquet, of the Schneider team, had a personal jealousy in addition to their desire to beat the others. Guyot, after his long delay, had got into the running in excellent style, although obviously unable to wipe out the initial handicap of 2 hours.

On his seventh round, after making second best time, Guyot pulled in for gas. He filled the dashboard tank from a big can without the use of a funnel, and in doing so allowed a considerable amount of gasoline to run over the car. Just as he was pulling away there was a pop at the carburetor and at the same instant flames appeared around the filler cap. Guyot and his mechanic jumped out and instinctively backed away from the car, while the grandstand spectators began to run at the fear of an explosion of the tank. But no explosion came, and after a few seconds of panic rags were thrown in to stifle the flames and in 5 minutes the fire was extinguished. Having replaced his burned out ignition wires, Guyot continued, put up a couple of fast rounds, but was unable to finish in the time limits.

Finish Is Exciting

Towards the end Zuccarelli and Barriaux were fighting for first place, with Champoiseau in a Schneider and Molon in a Vinot struggling for the following positions. The final result was doubtful when, with only 20 miles to run ,a ball bearing broke in the steering gear of the Alcyon car, making an easy win for Zuccarelli's Lion-Peugeot, putting Champoiseau's Schneider second with Molon's Vinot a very close third and Croquet's Schneider fourth. Duray had been held back by valve spring troubles. The two Cotes were regular without being particularly fast, and Riviere's Hispano-Suiza, a 4-year-old model of 2.5 by 7.8 inches bore and stroke, did not show itself equal to the modern cars. Summary:

BIG CARS

	Time
Goux, Peugeot	5:31:54
Leduc, S. P. A.	6:55:18
Boillot, Peugeot (out 7th lap); seized engine	
Crespelle, Crespelle (out 10th lap); broken valves	

SMALL-CAR RACE

Zuccarelli, Lion-Peugeot	6:12:22
Champoiseau, Schneider	6:30:36
Leon Molon, Vinot	6:31:31
Croquet, Schneider	7:00:33
Lucien Molon, Vinot	7:16:13
Nicodemi, Schneider	7:17:36
De Vere, Cote	7:41:35
Riviere, Hispano-Suiza	7:50:06
Duray, Alcyon	8:12:10
Ollier, Cote (out 10th lap).	
Barriaux, Alcyon (out 12th lap).	
Guyot, Picker-Guyot (out 9th lap).	
Jaubert, Schneider (out 8th lap).	
Koecklin, Koecklin (out 3d lap).	
Thomas, Lion-Peugeot (out 2d lap).	

To Give Gliddenites a Royal Send-Off

Detroit Will Entertain Tourists Before Start—Details of Route to New Orleans Announced—Description of Trophy Hung Up by American Automobile Association

DETROIT, MICH., Sept. 16—Preparations on a most elaborate scale are being made by Detroit motorists for the start of the annual national endurance run of the American Automobile Association from this city to New Orleans on October 7. The national tour committee has made arrangements with members of the Wolverine Automobile Club to furnish cars to carry the tourists around the city, before the start, passing all the big motor plants. On Saturday, October 5, the tourists are to be escorted to a special ferry and taken to Walkerville, Ont., where they will be entertained by the Walkers themselves. That same evening there is to be given a ball in honor of the women who are going on the tour, while following that there will be a midnight smoker for the men. On Sunday the visitors will be taken for an all-day trip on a large lake steamer.

The route as laid out calls for a journey of 1,670.3 miles along the following trail:

October 7—From Detroit to Fort Wayne, Ind., 170.5 miles—Through Ypsilanti, Clinton, Tecumseh, Adrian, Wauseon, noon stop; Archbold, Bryan, Hicksville.

October 8—From Fort Wayne to Indianapolis, 137.6 miles—Through Bluffton, Ind., Petroleum, Muncie, noon stop; Anderson, Noblesville and Pendleton.

October 9—From Indianapolis to Louisville, Ky., 135.8 miles—Through Franklin, Edinburg, Columbus, Seymour, noon stop; Brownstown, Kossuth, Salem, Perkin, and New Albany.

October 10—From Louisville to Mammoth Cave, 116.9 miles—Through Bardstown, New Haven, Buffalo, noon stop, and Horse Cave.

October 11—From Mammoth Cave to Nashville, Tenn., 107 miles—Through Cave City, Bristow, Bowling Green, noon stop; Franklin, and Goodlettsville.

October 12—From Nashville to Sheffield, Ala., 125.6 miles—Through Franklin, Tenn., Columbia, Mt. Pleasant, Summertown, Lawrenceville and Florence.

October 13—From Sheffield to Rogers Springs, Tenn., 98.8 miles—Through Tuscumbia, Cherokee, Iuka and Corinth.

October 14—From Rogers Springs to Memphis, 69.5 miles—Through Grand Junction, Moscow and Collierville.

October 15—From Memphis to Greenwood, Miss., 175.3 miles—Through Lynchburg, Tunica, Lula, Clarksdale, Tutwiler, Glendora and Schlater.

October 16—From Greenwood to Jackson, Miss., 170.7 miles—Through Skion, Lexington, Pickens and Canton.

October 17—From Jackson to Magnolia, Miss., 155.5 miles—Through Terry, Hazlehurst, Brookhaven and Johnston.

October 18—From Magnolia, to Baton Rouge, La., 87 miles—Through Kentwood and Dennis Mills.

October 19—From Baton Rouge to New Orleans, La., 116.7 miles—Through Kenner and Darrow.

The A. A. A. trophy, which is to be awarded to the entrant of a touring car which makes the lowest score, will be placed on exhibition at national headquarters during the coming week. The trophy is in the form of a cup, about 24 inches in diameter and 25 inches high, symbolic of the national character of the annual motoring event; the handles are formed by two eagles, beneath which are conventionalized motor car wheels. Around the top of the cup is a border, depicting touring in the Yellowstone park, semi-tropic scenes from California, Mount Washington and the sunny south. In the center of the front is a cartouche, in which appears the emblem of the A. A. A. This is the well known interlaced wheels with the letters A. A. A. of gold in high relief. On either side of the cartouche are figures symbolizing endurance and speed, the figure on the right expressing transmission of power.

Around the base of the cup is placed a border of ivy, entwined with ribbons, bearing the names of the state associations affiliated with the national body. The reverse of the trophy will bear the emblem of victory, a laurel wreath, within which will appear the inscription. The weight of the trophy is over 300 ounces, and, contrary to usual custom, the eagles surmounting it are solid. It rests upon an ebony base, the top of which forms a turn-table, so that the cup may be viewed from all sides without lifting.

BLOW FOR GOOD ROADS CAUSE

Columbus, O., Sept. 16—Official returns from eighty-eight counties in Ohio show that the proposed amendment to the Ohio constitution voted upon at a special election September 3, providing for the issuing of $50,000,000 bonds for the construction of a system of inter-county highways, was defeated by a vote of 272,560 for and 274,587 against, which is a majority of 2,027. It is a great disappointment to the good roads people of the Buckeye state as it was believed the measure was sure of passage. The most of the opposition came from counties which had improved highways and the people did not want to be taxed for the construction of roads in other counties where they had not been improved.

MEXICO WANTS ARMY CARS

City of Mexico, Mexico, Sept. 14—It is probable that congress at its present session will make an appropriation for the purchase of a large number of motor cars for use in the army. The purchase of several motor trucks also will be recommended by the war department.

The use of motor cars by army officers during the campaign which is being waged against the rebels in different parts of the republic has proved so satisfactory that it is planned that they shall, to a large extent, take the place of cavalry horses. The cars that are now in use by army officers are privately owned, but if it is deemed proper by the government they will form a part of the army equipment in the future.

General Victoriano Huerta has used an American seven-passenger Packard motor car all through his campaign against General Pascual Orozco and his rebel force in northern Mexico. He has found it a great advantage to him in traveling from place to place and in reaching points on short notice. Ordinarily on his trips General Huerta is accompanied by several members of his staff including a guide and engineer.

It is not known as yet how many motor cars the government contemplates providing for the officers of the army, but it is expected that all generals of divisions and colonels and lieutenant-colonels of regiments will be thus equipped at government expense. The motor trucks will be used chiefly for transporting ammunition and supplies.

TRUCKS FOR FRENCH AVIATORS

Paris, Sept. 6—Military aviation developments are profitable to the motor car business, for it is recognized that aerial scouts cannot do effective work in their own element unless adequately seconded by motor vehicles below. An example of this is shown by the recent delivery of sixty-three special trucks to the French army, all these trucks to operate with the aerial corps participating in the annual fall maneuvers to be held in a few days. The firms having received the commands are Panhard-Levassor, de Dion-Bouton, Delahaye, Aries, Brasier, Berliet, and Clement-Bayard. Each firm has delivered three trucks for carrying and housing an aeroplane and six wagonettes for the transport of mechanics and the usual aeroplane spares.

Trucks have very little that is distinctive, being the ordinary army type of motor wagon having a platform body with extensible canvas top. This top is mounted on telescoping hoops, making it possible to increase the height sufficiently to house a complete aeroplane with the wings folded against the fuselage. The vehicles will serve not only for carrying the aeroplanes from one headquarters to another when it is undesirable that they should cover the distance by flying, but they also provide protective cover for camping out. One of these trucks is attached to each aeroplane in the field.

The wagonettes have carrying capacity for ten persons, including the driver, two of the men being in front and eight within the rear entrance open body, sitting face to face. The wagon hauls a two-wheel trailer having a single shaft, at the end of which is a coupling for rapid connection to the rear of the wagonette. On this trailer are carried such common aeroplane spares as propellers, wires, skids,

wheels, and a few of the ordinary engine parts. The duty of these vehicles is to render first aid to aeroplanes, the men carrying out such repairs as can be accomplished without a workshop equipment.

In addition to these sixty-three vehicles orders have also been placed with de Dion-Bouton and with Delahaye for traveling motor car workshops. They consist of a 5-ton chassis mounted on rubber-shod wheels with a special closed body containing a lathe, drilling machine, band saw, forge, etc., all of them driven electrically and the entire workshop lighted by electricity. Each side of the truck body is hinged to open the lower of the two sections forming an extension of the floor space, and the upper portion giving protection against sun and rain. One of these traveling workshops is attached to each aerial escadrille—an escadrille comprizing six aeroplanes, generally of one make and type. They are so equipped that any repair to either the aeroplane or its engine can be carried out on the field. The repair wagon remaining near the headquarters staff has a low rate of travel.

SHOW AT MILWAUKEE FAIR

Milwaukee, Wis., Sept. 16—The most pretentious exhibit of motor cars ever made in Milwaukee, outside of the annual indoors show in the Auditorium, was the display made by Milwaukee dealers and state agents at the annual Wisconsin state fair, September 10 to 14. Machinery hall, an absolutely fireproof structure of solid concrete, was devoted entirely to motor car and accessory exhibits, the value of which was enhanced by the fact that demonstrators were permitted to operate motors and mechanisms while under roof. Exhibitors report good results, the rural visitors taking a deep interest which was by no means lacking of development into actual sales.

State agents are particularly pleased with the results obtained, having closed many contracts for local representation.

ANOTHER CHICAGO TEAM MATCH

Chicago, Sept. 16—The fall team match between the Chicago Athletic Association and the Chicago Automobile Club has been set for Saturday, October 5, when the two rivals will line up for a one-day run to George Ade's Hazelden farm at Brook, Ind., and back, with the Allen Ray and Carleton White trophies as the bone of contention. The novelist has extended an invitation to his fellow club men to pay him a two-hour visit and he will entertain them as he did the Chicago Motor Club reliability last fall. The finish of the match is to be at the South Shore Country Club, where the losers will pay for the dinners for all parties concerned.

Chicago Dealers Hold Fall Festival

Annual Display of New Cars Opened With Motor Truck Parade Participatedin by 700 Machines, Biggest Turnout of Commercial Vehicles Windy City Ever Has Had

CHICAGO, Sept. 14—Ushered in by a parade of 700 motor trucks in a procession 10 miles long, moving at the rate of 10 miles per hour, and taking 1 hour 10 minutes to pass a given point, the Chicago Automobile Trade Association heralded the second annual fall opening tonight. The occasion is the formal introduction of the 1913 models to the public, and the signal inauguration of the fall buying season, the new year of the motor calendar. Chicago's motor row boulevard, which is 3 miles long, has been garlanded with autumn decorations, and at night is lighted by the brilliant illumination of the showrooms and, as in last year's pageant, by electrically-lighted columns, extending along both sides of the street in a classic colonnade of imitation marble and leaded glass, strung with webs of electric lights.

The truck parade was made up of machines privately owned and exhibited, being entered in fleets by the dealers in the respective makes, who recruited cars, pairs, triplets and squadrons from among their customers. Several individual entries were made, notable among which was the Fair, whose division represented ten different makes in all types and capacities. This entry totaled thirty-eight cars.

On Monday night the fire and police department will do the honors. This demonstration will take place both afternoon and evening, and will include a parade and drill of the motor corps of the fire department. On Tuesday electric broughams will parade; Wednesday will be old car day, the veterans parading in the evening; Thursday will be Chicago Motor Club day, a pleasure car parade taking place in the evening; Friday, old and new car day, will also be closed by a parade of cars of all ages in the evening, and the close on Saturday will be celebrated by a tire-rolling contest, the tire companies entering teams of four men to roll the tires of their respective makes in relays, on a course three miles long. Saturday evening there will be a general get-together meeting and supper of the officials and members of the Chicago Automobile Trade Association at the Hotel Metropole.

The large number of entrants in the motor truck parade was unexpected, and proved a big surprise to everyone. Plans had been made for 500 trucks, a course 8½ miles long being laid out. This course proved too short, as the leaders had run the full course and returned to the starting point before many of the other trucks had started.

Perhaps the most notable feature of the exhibition was the silence of the large majority of the cars. This applied not only to the shaft-driven and pneumatically-tired gasoline machines and electrics, but to the prevalent type of solid-tired chain-driven trucks. Many trucks carried full loads, a 5-ton lumber truck being loaded with a large load of lumber, and a truck owned by a cooperage concern being piles high with barrels, a good advertisement of the business.

Of the 700 machines in line fifty-seven were electrics. The prevailing type among the gasoline cars was from 1 to 2 tons capacity, chain-driven, with the motor under the seat, and solid tires. A large contingent, however, were of radically different type, as 115 were shaft-driven, and 201 were of the so-called European type, with the motor under the hood, as in pleasure car practice, this type being prevalent in the very small and the largest classes. One hundred and six of the total number were under 1 ton capacity, a large number of high-wheeled wagons being shown. Very few of the big fellows appeared, but seven 5-tonners and eight of greater than that capacity were entered.

Of especial significance is the growth of the left-hand steer idea, fully 25 per cent of the trucks being so equipped. Most of these, however, had the levers on the left, although a few were noticed with center control, in both right and left hand steer types. Block or sectional tires were not much in evidence, even in the larger sizes, the wide tread dual types seeming to have the preference. Fully a hundred of the machines were equipped with pneumatics.

Some idea of the magnitude of the parade may be had from the fact that the cars were lined up from Fifty-eighth street to Twenty-eighth street on Wabash avenue, a distance of nearly 4 miles, before the start. The line of march, which was 8½ miles in length led from Twenty-eighth street and Michigan avenue to Monroe street and Michigan avenue, 3½ miles north, and from thence through the business section, emerging on Michigan avenue again at Jackson street, and running south from thence to Thirteenth street to the Metropole hotel, the headquarters of the C. A. T. A., where the parade of the trucks disbanded.

The triumphal march through the motor car market to which Michigan avenue from Thirty-fifth street to Twelfth street, a distance of 3 miles, is almost entirely given over, was through a blaze of light and was watched by big crowds.

Routes and Touring Information

SNAKE-LIKE ROAD WINDING UPWARD TO THE RESERVOIR AT SMILEY HEIGHTS

CALIFORNIA motorists are rejoicing at the opening of Smiley Heights, at Redlands, to motor cars, for this famous driveway and pleasure park is one of the finest show places in the state, yet until this year it was open to horse-drawn vehicles only. The reason for the opposition to motor cars on the part of the owner, A. K. Smiley, was that the roads are very narrow, winding and in some places have a rather heavy grade, and he believed that accidents might result from the admission of motor cars. Mr. Smiley is well advanced in years and tenacious in holding to what he considers a well-founded objection, but recently he became the owner of a fine car and his views on the safety of motors underwent a change.

The Automobile Club of Southern California agreed to mark the road, and has done so, warning against a sp miles an hour. This is as fast as any car sh winding road, not alone for safety but becaus orange groves and villas, with the snow-capp altogether too fine to hurry past. Traffic is dir as the road is too narrow in some places for veniently. Its surface is perfect, however, fre and it follows a winding course along ridges b ing eucalyptus trees and set out with rare flo miles of this private park road, and as it opens road, a public way known as Sunset drive, th in store for motorists who visit California this

TO DES MOINES, IOWA

ROCHESTER, Minn.—Editor Motor Age—Please give me the best route between here and Des Moines, Ia.—Fred Young.

Head west to Owatonna through Byron, Kasson, Dodge Center and Eden. The distance is 44 miles and after reaching Byron over rather rolling country with one or two rough spots, it will be level going and quite good.

The main traveled road to Mason City lies through Geneva, Albert Lea, Glenville, Northwood, Kensett and Manley, and is 73 miles; Marshalltown is reached by way of Rockwell, Sheffield, Hampton, Iowa Falls, Eldora, Gifford, Union, Liscomb, Albion and Marshalltown. Two routes are offered you to Des Moines, one through Laurel, Newton, Colfax, Mitchellville, Altoona and Des Moines being 69 miles; and the other over the Iowa transcontinental to State Center, Colo, Nevada and Ames, 39 miles, then south 32 miles through Hukley and Ankeny. Complete running directions are in volume 5 of the Blue Book.

TRIUMPH, MINN.—PORTAL, N. D.

Triumph, Minn.—Editor Motor Age—I should like to have the best route from Triumph to Portal, N. D.—B. R. Pope.

Passing through St. James, Butterfield, and Sanborn you reach the main traveled road to Brookings, S. D., which runs through the towns of Lamberton, Revere, Walnut Grove, Tracy, Balaton, Lake Benton, Elkton, Aurora, Brookings.

The Meridian road n Toronto, Clear Lake, A Milbank, Big Stone Cit ton, Graceville, Collis, White Rock, Blackmer, Wahpeton, Dwight, Al tine, Hickson, Wild Ri Fargo, being 213 miles tinues 96 miles to Gra through Mapleton, Hill nolds, Thompson, Merr Forks.

It is not advisable to c further west than Dev there are one or two c you travel mile after m thing in sight and it i should there be a break

if you have a Blue Book volume 5 which has the running directions from Lamberton, Minn., to Minot, N. D., it makes it a trifle better.

Grand Forks to Devil's Lake, 100 miles, is Larimore, McCanna, Petersburg, Michigan, Mapes, Lakota, Bartlett, Crary; then to Minot, which is 138 miles, the towns are Grand Harbor, Churches Ferry, Leeds, Knox, Pleasant Lake, Fero, Turnbridge, Towner, Denbeigh, Granville, Surrey. Inquiry should be made at Minot before leaving for Portal.

INDIANA TO PENNSYLVANIA

Lafayette, Ind.—Editor Motor Age—I would like to know the best route from Lafayette to Pittsburgh, Pa. What are the road conditions and distances? Is it necessary to secure a license in any other state?—J. C. Schuessler.

A direct route would be to motor via Lima and Canton, the entire distance being approximately 416 miles. There is a good gravel road from Lafayette to Lima, O., 164.9 miles through Edna Mills, Sedalia, Middlefork, Burlington, Kokomo, Sycamore, Marion, Montpelier, Keystone, Domestic, Mercer, Mendon, Monticello, Spencerville, Lima.

Leaving Lima with Canton, O., 153 miles, your next objective point on this route, you pass through Ada, Forest, Upper Sandusky, Bucyrus, Galion, to Mansfield over good road; from this point through Mifflin, Hayesville, Jeromesville, Reedsburg, to Wooster you will have some hills to negotiate; thence through Dalton, Greenville, Massillon, Canton.

It is but 98 miles to Pittsburgh from Canton, O., the intermediate points being Louisville, Harrisburg, Alliance, Salem, Columbiana, Unity, O., Darlington, Pa., Beaver Falls, Rochester, Freedom, Economy, Ambridge, Sewickley, Pittsburgh.

An optional route is Industry, Magnolia, New Harrisburg, Carrolltown, Harlem, Amsterdam, Richmond, Wintersville, Steubenville, Paris, Florence, Santiago, Remalton, and Grafton.

Your own state license will suffice, but it must be displayed while touring through the state. The 1912 edition of volume 4, Blue Book, gives complete running directions.

ST. JOE, MO.—KANSAS CITY, MO.

Denver, Colo.—Editor Motor Age—What is the best route to St. Joseph and Kansas City, Mo.? Is it wiser to travel 72 miles to Colorado Springs from Denver and then to Limon, rather than start due east from Denver to Limon?

2—There are to be two women in the party, and I would like to kn
divide off each day's travel so
easy running.

3—Are the roads in such co
to justify amateurs making the
reasonably pleasant circumstan
the road difficulties too great t
the trip being enjoyable?—C. H.

It is probably best to rout
of Colorado Springs to Lim
through Littleton, Sedalia, Pe
Palmer Lake, Breed, Colorado
Falcon, Calhan, Limon and is
the stop for your first night.
day's run is 149 miles to Colb
routing through Genoa, Bovina
Flagler, Seibert, Vona, Stratton,
Burlington, Kanorado, Kans.,
Goodland and Levant.

The third day you will have
rough going to Mingo and Oa
from there on good natural roads
nate through Campus, Grinnell, G
Quinter, Collyer, Ogallah, Hays,
Walker, Gorham, Russell, Dorra
Wilson, being 168 miles; or if g
is made it would be a good thing
to continue to Ellsworth, Kanopo
neiro, Brookville and Salina, ma
mileage 225.

Salina to Topeka is 132 miles, th

THE ROAD FOLLOWS A WINDING COURSE ALONG THE RIDGE OVER REDLANDS

TALL EUCALYPTUS TREES LINE THE ROAD TO SMILEY HEIGHTS AT REDLANDS

being Solomon, Abilene, Detroit, Chapman, Junction City, Fort Riley, Ogden, Manhattan, Wamego, St. Mary, Rossville, Topeka.

You can reach St. Joseph the next day as it is 162 miles from Topeka, the road running through Grantville, Perry, Buck Creek, Midland, Lawrence, Endora, De Sota, Bonner Springs, Muncie, Kansas City, Piper, Wallula, Leavenworth, Lowemont, Atchison, Russville, St. Joseph.

You will notice the longest day's run is 225 miles and this should be made for the reason of better hotel accomodations. Faster time can be made on this stretch of road than through the next day's itinerary if you start right after a rain. If you have never done any traveling outside of macadam boulevards you will of course think some stretches are frightful, but with careful driving upon such occasions there is no reason why you should not have a thoroughly enjoyable trip.

It is advisable to provide yourself with a Blue Book Volume 5, which contains running directions of the entire journey.

DUBUQUE, IA.—MENOMINEE, MICH.

Manchester, Ia.—Editor Motor Age—Please publish the shortest route from Dubuque, Ia., to Menominee, Mich.—J. J. Welterlen.

Dubuque to Madison, Wis., is 103 miles through a hilly country but with excellent views routing through Fairplay, Cuba, Elm, Platteville, Calamine, Mineral Point, Dodgeville, Ridgeway, Barneveld, Blue Mounds, Pine Bluff. Fond du Lac is reached over mostly gravel roads and is 73 miles distant through Sun Prairie, Columbus, Beaver Dam, Waupun.

The direct road to Oshkosh is through Van Dyne and is 19 miles, but if you have plenty of time a pleasant detour of 71 miles is Rosedale, Ripon, Green Lake, Berlin, Waukan, and Zion to Oshkosh.

Oshkosh to Green Bay is 55 miles and you will find macadam or gravel roads through Neenah, Menasha, Appleton, Kaukauna, Wrightstown, and De Pere. A 58 mile jaunt over stone or gravel roads leads through Big Suamico, Little Suamico, Brookside, Collardsville, Oconto, Peshtigo, and Marinette. The Blue Book No. 4 will give you running directions with maps and road conditions.

LAMAR, MO.—ROUNDHOUSE, ILL.

Joplin, Mo.—Editor Motor Age—Please give the route from Lamar, Mo., to Roundhouse, Ill.—J. M. Sheets.

Your routing north to Kansas City lies through Irwin, Sheldon, Nevada, Wales, Horton, Arthur, Rich Hill, Athol, Butler, Adrian, Archie, Lonetree, Harrisonville, Belton, Grandview and Kansas City. Crossing Missouri the traveled thoroughfare leads through Independence, Blue Springs, Grain Valley, Oak Grove, Odessa, Mayview, Higginsville, Corder, Blackburn, Mt. Leonard, Marshall, Slater, Glasgow, Armstrong, Huntsville, Moberly, Renick, Clarke, Mexico, Laddonia, Vandalia, Curryville, Bowling Green, and Louisiana. Ferry across the river at Louisiana and continue to Pittsfield, Winchester and Roundhouse.

AN ILLINOIS-IOWA ROUTE

Watseka, Ill.—Editor Motor Age—Please route from Watseka to Shelbyville, Ill., also from Watseka to Webster City, Ia.—W. E. Herrick.

First go to Gilman, then 53 miles to Champaign by way of Onarga, Buckley, Loda, Paxton, Rantoul. The best road to Shelbyville is 86.5 miles through Savoy, Monticello, Maroa, Decatur, as against about 65 miles from Champaign through Tuscola, Arcola, Mattoon and Shelbyville.

Routing to Webster City from Gilman to Kankakee is 29 miles through Ashkum and Clifton; then heading west to Goodrich, Dwight and Streator, north to Grand Ridge and Ottawa and west to Utica, La Salle, Leru, Seatonville, Hollowayville, Princeton, Wyanet, Sheffield, Mineral, Anawan, Geneseo, Briar Bluff, Moline and Davenport, Ia., being 174 miles.

Maysville, New Liberty, Bennett and Clarence will find you on the Iowa transcontinental road which you will follow through Stanwood, Mechanicsville, Lisbon, Mt. Vernon, Marion, Cedar Rapids, Belle Plaine, Chelsea, Gladstone, Tama, Montour, Le Grand, Marshalltown, State Center, Colo, Nevada, Ames, Jordan, Boone, and is 211 miles. Webster City is 33 miles north of Boone.

Running directions from Gilman to Davenport can be found in the Blue Book, No. 4, while the balance of the route is outlined in the volume 5.

QUINCY, ILL.-SEDALIA, MO.

Quincy, Ill.—Editor Motor Age—I would like to know the best route from Quincy, Ill., to Sedalia, Mo.—F. J. Hendrickson.

The best way for you to reach Sedalia is to go by the way of Mexico, Mo., and Marshall, the itinerary for such a route being as follows: Quincy to Hannibal, 22 miles, through Seehorn and Sheperd, and 62 miles further to Mexico, through Oakwood, New London, Center, Hutchinson, Laddonia, Mexico.

Covering a distance of 97 miles over clay and dirt roads, from Mexico to Marshall, you pass through Thompson Station, Clark, Renick, Moberly, Huntsville, Armstrong, Glasgow, Slater, Marshall.

From Marshall go east 38 miles to Boonville, through Arrow Rock and Lamine; from Boonville follow the M., K. & T. railroad to Sedalia.

The Blue Book No. 5 covers the trip, with running directions as far as Boonville.

JOLIET, ILL.-MADISON, IND.

Lafayette, Ind.—Editor Motor Age—Kindly outline the best route from Joliet, Ill., to Madison, Ind., more particularly that portion from Indianapolis to Madison. What kind of roads will I find and what is the total mileage?—Woodside.

Leaving Joliet, go directly east through Cherry Hill, Gaugers, New Lenox, Frankfort, Richton, Chicago Heights, to Dyer; thence through Schererville, St. Johns, Crown Point, Orchard Grove, Thayer, Roseland, Fair Oaks, Aix, Rensselaer, Remington, Wolcott, Montmorenci, to Lafayette, a distance of approximately 140 miles.

From Lafayette to Indianapolis, a route via Frankfort and Kirklin, Ind., follows a good gravel or macadam road the entire distance of 68 miles, through Dayton, Mulberry, Frankfort, Cyclone, Kirklin, Rossston, Augusta, Indianapolis.

Going directly south over fine gravel road from Indianapolis to Seymour, Ind., 63 miles, the intermediate towns are Southport, Whiteland, Franklin, Amity, Taylorville, Columbus, Walesboro, Waynesville, Jonesboro, Seymour. Go east from Seymour about 16 miles to Vernon, from which point it is but a short distance to Madison through Dupont.

This route, with the exception of that portion from Vernon to Madison, is completely covered with running directions in volume 4 of the Blue Book.

SEEKS A MISSOURI ROUTE

Larimore, Mo.—Editor Motor Age—I would like the best route between St. Louis and Kansas City, via Columbia and Boonville, Mo.—Julius O. Trampe.

The route requested follows practically the historic trails of Missouri, that portion from St. Louis to Boonville being over the old Boon's Lick road, and the remainder of the route into Kansas City passing over the first part of the Santa Fe trail. This trip can easily be made in two days, your night stop being at Columbia, Mo., a distance of 141 miles. Leaving St. Louis, the towns en route are: Wellston, St. Charles, Harvester, Colterville, Dardenne, Foristell, Wright City, Warrenton, Jonesburg, Danville, Mineola, Calwood, Fulton, Millersburg, Columbia.

From Columbia it is approximately 160 miles to Kansas City, going through Rocheport, New Franklin, where you take the ferry over the Missouri river, continuing west through Boonville, Arrow Rock, Marshall, Waverly, Dover, Lexington, Wellington, Levasy, Buckner, Independence, Kansas City. Blue Book, volume 5, gives complete running directions.

RIDGEWAY, PA.—TULSA, OKLA.

Tulsa, Okla.—Editor Motor Age—I am going to drive my car from Ridgeway, Pa., to Tulsa, and would like a routing via Cleveland, O., and Kansas City. I know the route to Cleveland.—E. D. Avery.

You can route to Columbus which is 171.5 miles, the best road lying through Rocky River, Oberlin, Kipton, Wakeman, Townsend, Norwalk, Monroeville, Bellevue, Republic, Bloomville, Lykens, Brokensward, Bucyrus, Marion, Norton, Waldo, Delaware, Lewis Center, Columbus.

Columbus to Indianapolis, Ind., is 171.6

miles passing through Vienna, Lafayette, Summerford, Brighton, Vienna, Harmony, Springfield, Donnelsville, Brandt, Fountaine, Tadmore, Vandalia, Englewood, Arlington, Lewisburgh, Gettysburg, Richmond, Centerville, Germantown, Cambridge City, Dunreith, Ogden, Knightstown, Charlottesville, Greenfield, Cumberland, Indianapolis. To reach Terre Haute travel 70 miles further on the National Pike and go through Bridgeport, Plainfield, Belleville, Stilesville, Mt. Meridian, Coatsville, Manhattan, Reelsville, Harmony, Brazil and Seeleyville.

The stretch from Terre Haute to St. Louis is 173 miles by following the main traveled road through Cohn, Marshall, Clarks, Martinsville, Oakleaf, Casey, Greenup, Jewett, Woodbury, Montrose, Teutopolis, Effingham, Dexter, Altamont, Vandalia, Hagerstown, Mulberry, Greenville, Stubblefield, Pocahontas, Highland, Collinsville, and St. Louis.

A very good road is the following: At Bucyrus, head west for Lima by way of Osceola, Upper Sandusky, Forest, Dunkirk, Ada, being 65 miles. A good gravel road lies 165 miles through Spencerville, Domestic, Petroleum, Montpelier, Marion, Swazee, Sycamore, Kokomo, Burlington, Middlefork, Lafayette.

Routing to Springfield, Ill., takes in Odell, Attica, Rob Roy, Stone Bluff, Covington, Danville, Urbana, Champaign, Savoy, Monticello, Maroa, Decatur, Niantic, Lanesville, New Buffalo, Springfield, and is 196 miles.

It is 109 miles to St. Louis over natural dirt roads through the towns of Cotton Hill, Glenarm, Litchfield, Mt. Olive, Staunton, Worden, Carpenter, Edwardsville, Marysville and Collinsville.

Across Missouri the route is Wellston, Lyndhurst, Pattonville, Harvester, Colterville, Dardenne, Wentzville, Foristell, Wright City, Warrenton, Jonesburg, Danville, Mineola, Williamsburg, Calwood, Fulton, Millersburg, Columbia, Rocheport, New Franklin, Boonville, Arrow Rock, Waverly, Dover, Lexington, Myrick, Wellington, Levasy, Buckner, Independence, Kansas City. To Columbia it is 141 miles and to Kansas City it is 159.

Garnet, Olathe, Ottawa, Chanute, Cherryvale, Coffeyville, Oologah, Okla., Collinsville and Tulsa, is the finishing stretch.

HARVEL, ILL.—TABLEROCK, NEB.

Harvel, Ill.—Editor Motor Age—How can I obtain a route map or plan showing the best roads between Harvel, Ill., and Tablerock, Neb.? Would September or October be a good time to make such a trip?—C. M. Forrester.

The route for you to follow lies toward St. Louis through Litchfield, Mt. Olive, Staunton, Worden, Carpenter, Edwardsville, Marysville, Troy and Collinsville. Follow the Boon's Lick road through Wellston, Lyndhurst, Pattonville, Harvester, Colterville, Dardenne, Wentzville, Foristell, Wright City, Warrenton, Jonesburg, Danville, Mineola, Calwood, Fulton, Millersburg, Columbia, Rocheport and New Franklin, 171 miles. Ferry across the Missouri river and go straight into Boonville, and on to Arrow Rock, Marshall, Waverly, Dover, Lexington, Myrick, Wellington, Levasy, Independence and Kansas City.

Go north through Kansas, touching Piper, Leavenworth, Lowemont, Atchison, Lancaster, Huron, Pierce, Everts, Hiawatha, Falls City and is 118 miles. Tablerock is in the next county.

For running directions, maps, etc., the Blue Book No. 4 will give you such information as far as St. Louis, and the No. 5 from St. Louis to Falls City, Neb. Each volume sells for $2.50 and is published by the Blue Book Publishing Co., Chicago.

Blue Book Road Reports

THE Blue Book car has sent in the following reports on road conditions on routes which it has covered during the past week:

A new route is Portsmouth to Maysville, Ky., via West Union. The Blue Book crew, before attempting this trip, knew that conditions were anything but good for tourist travel and they were not disappointed, as they found the road, although a hard one most of the way, to be very rough and through a hilly country a considerable part of the distance.

Maysville to Lexington via Paris was found to be an agreeable change to most of those gone over in southern Ohio. The road is excellent macadam all the way and although quite winding it is direct with some picturesque scenery.

Lexington to Richmond is a short route over good macadam through a beautiful country in the heart of the Blue Grass section.

Richmond to Danville is over macadam road although not quite so good as the previous route.

A new route is from Danville to Louisville. The first part of this trip follows quite closely the Kentucky river valley, which is famous as one of the most beautiful sections in any of the central states. Instead of going to Harrodsburg it is direct to the old shaker settlement at Shakertown, which is only a mile from High bridge, then across Kentucky river at Brooklyn bridge. About a mile north of Brooklyn bridge the route swings westward through Troy into Versailles and Frankfort, where the regular Blue Book route is followed to Louisville.

Louisville to Mammoth Cave via Bardstown and Buffalo. The first part of this route to Bardstown is over excellent stone road and although the remainder is nowhere near so good it is not bad and considerable improvement is constantly being made. Lincoln farm is only 2½ miles from Buffalo and the Blue Book car made this detour to get the directions in order that tourists may easily visit this historic point with a minimum amount of trouble. From Bear Wallow the route goes to Cave City and Mammoth Cave. While in this section data was taken on a cutoff which makes it unnecessary for tourists to go back to Bear Wallow in order to pick up the through route.

Mammoth Cave to Nashville. This route continued southward through Scottsville, Gallitan and Green River. Road conditions on this part of the route are about as bad as they have been pictured to various tourists. Although the worst part of the route is over a comparatively short distance, conditions are so bad that it spoils the whole trip. The worst section is between Magnolia and Green River, conditions ranging from deep sand to large boulders and cobble stones. Although this latter will make a very fine foundation for good roads nothing has been done to improve conditions for a good many years. From local information it is understood that for next year a detour will be completed around this bad part.

Curtis Hill, state engineer of Missouri, reports that due to bridge work and grading which is going on in Howard, Boone and Callaway counties it is advisable for tourists making the trip in either direction between St. Louis and Kansas City to avoid the route through these counties which lie between Boonville and Marshall. People going west from St. Louis should use route 621 instead of route 628 and at Rennick they should leave route 622 going north through Moberly and west through Huntsville, then south again, meeting the regular route at Armstrong. Coming east from Kansas City it is advisable to follow route 710 from Marshall and at Armstrong go north to Huntsville and then east through Moberly and south again, meeting the route at Rennick.

September and October are excellent months in which to tour. Many motor car club runs are held off until these months. An example might be given of a Chicago club starting on a tour around Lake Michigan October 21.

CHICAGO—MANSFIELD, O.

Chicago—Editor Motor Age—Please publish the most direct route from Chicago to Mansfield, O.—H. G. S.

Follow the South Bend route as far as La Porte through South Chicago, Whiting, Grasselli, Gibson, Hessville, Highlands, Schererville, Merrillville, Ainsworth, Deep River, Valparaiso, Westville, Pinhook, La Porte, then route to Fort Wayne through Kingsbury, Union Center, Hamlet, Donaldson, Plymouth, Bourbon, Etna Green, Atwood, Warsaw, Pierceton, Larwell, Columbia City, Fort Wayne, being 173 miles so far.

This can be shortened by leaving the South Bend road at Valparaiso and routing through Wanatah, Hanna, Hamlet and Donaldson to Plymouth, but there is about 20 miles of rather poor road with some sand just beyond Valparaiso.

You can just as well go from La Porte to New Carlisle and South Bend, making this at noon the first day, then to Mishawaka, Osceola, Goshen, Benton, Ligonier, Kimmell, Wolf Lake, Churubusco and Fort Wayne. This makes the distance from La Porte to Fort Wayne 95 miles with the roads from South Bend all good gravel.

Fort Wayne to Mansfield, O., is 155 miles and the towns are New Haven, Van Wert, Delphos, Elida, Lima, Ada, Forest, Upper Sandusky, Bucyrus, Galion and Ontario.

MICHIGAN TO WISCONSIN

Chicago—Editor Motor Age—Kindly inform me of the best route from Grand Rapids, Mich., to Baraboo, Wis., and Stevens Point.—R. J. Schlesinger.

Grand Rapids to South Bend, Ind., is 118 miles and routes through Cutlerville, Moline, Wayland, Martin, Bradley, Plainwell, Kalamazoo, Almena, Paw Paw, Decatur, Dowagiac, Pokagon, Sumnerville, Niles, South Bend.

South Bend to Chicago can be made in a half a day and the towns are Plainfield, New Carlisle, Rolling Prairie, La Porte, Westville, Valparaiso, Merrillville, Schererville, Highlands, Hessville, Grasselli, Whiting, South Chicago and Bryn Mawr. The Lake Geneva road is through Niles, Wheeling, Half Day, Libertyville, Greys Lake, Volo, McHenry, Richmond, Genoa Junction, and is 68 miles.

To Madison and Baraboo is Delavan, Emerald Grove, Janesville, Edgerton, Staunton, McFarland, Madison, Ashton, Sauk City, Prairie du Sac and Baraboo. There is some sand on the way to Portage, but it is not as bad as from Kilbourn to Portage. Fox Lake Waupun, Brandon, Ripon, Pickett, Oshkosh, Dale, Redfield, Fremont, Weyauwega, Waupaca, Amherst, Stevens Point.

The Readers

Difference in Radiating Efficiency of Cooler Types—Acute Accelleration Produces Pound—Insufficient Data to Give Horsepower Rating—Some Racing Queries

Efficiency of Radiators

Cooling Efficiency of Cellular and Tubular Types of Water Coolers Compared

CHICAGO, ILL.—Editor Motor Age—I have noticed that in spite of the claims of manufacturers of honeycomb radiators, the tubular types still prevail. What is their relative efficiency, and if one type is more efficient than the other, why is the other type of radiator used on high class cars?—H. W. P.

The cellular or honeycomb type is generally accredited with being superior in actual efficiency to those of the tubular type. Three factors enter into the efficiency of radiators of types of equal volume, these being radiating area of both air and water, thickness of the walls, and the radiating properties of materials used in construction. Of two radiators, one of the tubular type and the other of the cellular type, having equal volumes, occupying the same amount of the front area of the car, made of equal thickness of wall, of the same quality of copper or bronze and possessing the same amount of external radiating area, the cellular, if of the standard type, would prove more efficient than the tubular form, because the shape of the water stream is that of a thin wide sheet, practically the entire volume being in contact with the interior radiating surfaces, Fig 1, while in the tubular form, it is in the form of a cylindrical column a smaller proportion of which volume is in contact with the walls of the radiator, although the external radiating surface may be even greater than that of the cellular type.

It is thus seen that all other things being equal, a radiator's efficiency is measured by the extent of its internal or water radiating surface. The efficiency of radiators of different types is usually determined by practical tests and experiments, always considering the correlated factors to efficiency, of manufacturing cost and durability.

The tublar type, if properly designed and adapted, will cool the motor car engine with thorough satisfaction, and as its manufacturing cost is less than that of the cellular, and radiators of this type are less susceptible to damage from objects striking them, they are preferred by many makers to the higher efficiency but more fragile cellular type.

ACCELERATION CAUSES KNOCK

Joplin, Mo.—Editor Motor Age—If, while jogging along a level road, I suddenly open the throttle wide, my motor does not pick up well and develops a sharp spark knock. It is necessary to fully retard the spark until car has gained considerable speed in order to stop the knock. Cylinders are practically clear of carbon and I have gradually opened the air valve on carbureter to the limit without results. Motor is 1910 Rutenber, 4½ by 5; Schebler F carbureter and Bosch magneto.—Subscriber.

This behavior on the part of your motor, if it is peculiar to the conditions you specify, is nothing abnormal, as any motor if too suddenly accelerated will choke up, and with an advanced spark, pound a little. Such a pound is a spark knock and, provided the motor is otherwise performing properly, is to be regarded as a good sign. In regard to your tampering with the air-valve adjustment in an attempt to remedy an inherent and perfectly normal development, you are making a grave mistake. Adjust your carbureter for the best running at all speeds, and leave it alone until you are sure that it has been thrown out of adjustment by tampering, vibration, or a radical change in conditions, atmospheric or operating, that manifests itself in imperfect running of the motor due to imperfect carburetion. Always open your throttle steadily and evenly, avoiding erratic acceleration or throttling. The brilliant get-aways and choke-offs indulged in by some drivers are pleasing to watch, but are a useless strain on the entire mechanism. They are accomplished usually with the spark and throttle in conjunction, and require skill, at the best.

MANY HORSEPOWER QUERIES

Chicago, Ill.—Editor Motor Age—Give the actual horsepower of a 4¾ by 5½ motor at the following speeds: 15, 25, 35, 40, 50, and 60 m.p.h. The gear ratio on the high is 3.5 to 1.

2—Give the crankshaft speed at the above mentioned miles per hour.

3—Which is the highest average speed, Tetzlaff's at Santa Monica or Dawson's at Indianapolis.

4—Give the speed claimed, the weight, and the average fuel mileage of the Stutz coupe.

5—Give the weight, size of motor, and the gear ratio of the special Ford which won the 1912 Algonquin Hill climb.

6—What make of car is Disbrow's Jay Eye-See?

7—Is Disbrow's Simplex Zip the same car that de Palma drove at the Hawthorne meet in 1911 or is it just another car of the same model?

8—Is there an ordinance in Chicago giving the right hand vehicle the right-of way when two vehicles meet at right angles at a crossing?—Fleming H. Sherlau

1—Actual horsepower cannot be computed theoretically, but must be determined by brake, dynamometer or similar tests. The rated horsepower cannot be computed by the aid of the above data, without the number of cylinders and the wheel sizes being given. To enable you to figure this out, when you have all of the data before you, we quote the modified S. A. E. formula, which was published in Motor Age, in the issues of July 25th and August 1st.

$$H.P. = \frac{D^2 N S R}{15{,}000}$$

Where

D=Bore in inches
S=Stroke in inches
R=Revolutions of crankshaft per minute
N=Number of cylinders

2—To determine the revolutions per minute of your motor when travelling at

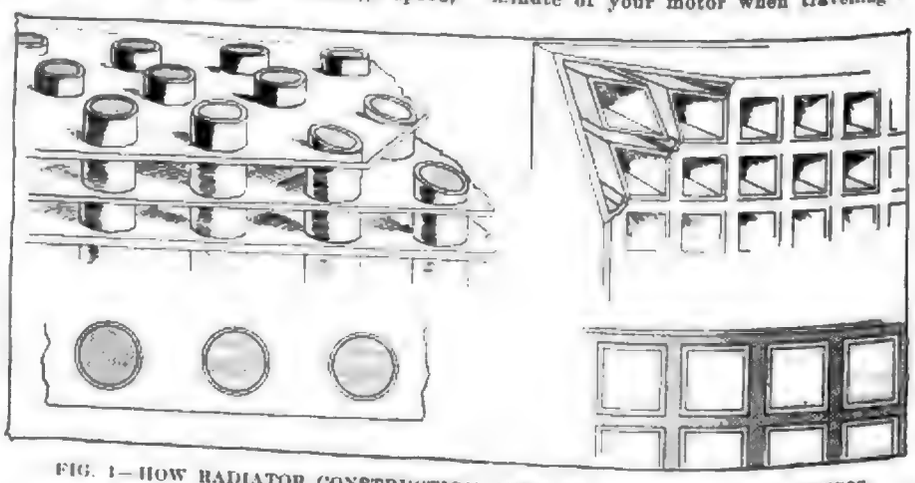


FIG. 1—HOW RADIATOR CONSTRUCTION AFFECTS COOLING EFFECTIVENESS

Clearing House

Dressing Down Viabrator Contacts the Cure for Cylinder Miss —Economy of British Cars Compared with the Home Product—Lighting Dynamo of Cole Car Dissected

certain speeds, with a certain wheel size, and with a gear ratio of 3.5 to 1, reference may be made to the chart on page 49 of Motor Age, issue of May 16. In case you have not this number on file, the following formula will give the same results:

$$R.P.M. = \frac{5{,}280\ C\ S}{R}$$

Where

R.P.M.=Revolutions per minute
C =Circumference of wheel
S =Speed of car
R =Gear ratio

The constant 5,280 is the number of feet in a mile.

C is found by multiplying the wheel diameter by 3.1416.

3—The average speeds of both drivers in their respective races were 78.7 miles per hour.

4—The Stutz car with coupe body weighs 3,200 pounds, is claimed to be capable of 55 miles per hour, and to give 14 to 16 miles per gallon of gasoline.

5—The motor size is 4⅞ by 5½; the cylinders are aluminum castings with steel linings.

6—Disbrow's Jay-Eye-See is a specially constructed car with a Fiat motor.

7—It is the same car.

8—There is no such ordinance on the Chicago statute books.

ENGLISH ECONOMY VS. AMERICAN

Otto, N. Y.—Editor Motor Age—On page 19, issue July 18, 1912, Motor Age, I notice high-speed test of a Napier. Now, is it a fact that any car can get an average of 23.91 miles per gallon of gasoline from a 5,000-pound machine rated at 60 horsepower, running almost 2,000 miles? If they can do it in England, why cannot the manufacturers in this country do it?

I have a model T Ford and on some runs, with four or five in car, can average 25 miles per gallon for 75 to 100 miles.—S. G. Burdick.

The Napier which made the economy record to which you refer was a specially tuned-up and driven car, the run being made under the personal supervision of C. F. Edge, its manufacturer, and over English highways. A good parallel to this is the record made in the recent Quaker City economy run by W. L. W. Jones in an American, in which 22.07 miles were obtained per gallon of gasoline. This latter record was made over ordinary American roads, which are not to be compared with the splendid boulevards of England. It must also be borne in mind that the European cars are made with the idea of gasoline economy paramount, owing to the high price of gasoline. American cars are designed to save weight and economize on first cost, tires and lubricating oil, while English cars to some extent subsidize all of these considerations to the one object of saving gasoline.

Your record of 25 miles to the gallon on your Ford model T is not unusual, as with specially tuned-up cars of this make, which is the only fair basis of comparison with the Napier of which you speak, as high as 35 miles has been gotten from a gallon. It must be remembered that the American car, previously referred to, was driven by an amateur.

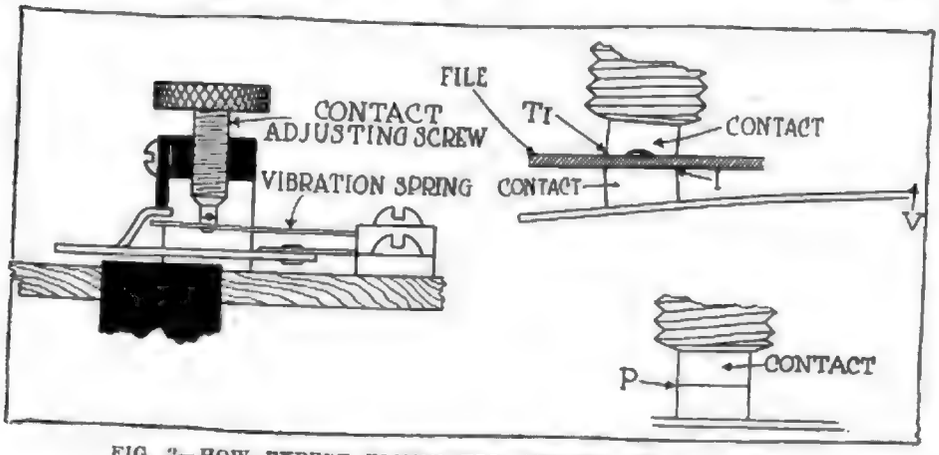


FIG. 2—HOW EXPERT ELIMINATED MISFIRE IN BIG MOTOR

Pits in Platinum Points

Carpenter Finds Small Thin File Balm for Missing Cylinder of Large Motor

SAUK CENTER, MINN.—Editor Motor Age—Today I was called upon to find out why a high-powered roadster would not develop its usual speed and power, and I must confess I was somewhat puzzled to find the real cause of the trouble. I went over the ignition system very carefully and tested each cylinder and found they worked all but cylinder No. 1, which would fire at certain intervals only. When the throttle was opened wide it would work well, but as one would gradually close the throttle this cylinder would miss and snap and crack at a great rate. I tested the plug, which was almost new, porcelain, and substituted a mica with no better results. I then cleaned the timer and found this in good order, and what was most mysterious, the spark coming freely through the plug when it was laid on the cylinder head, which would lead to the belief that there was a leak or cracked porcelain, which I did not find.

I now turned my attention to the coil and adjusted the vibrator forward and back until I was satisfied that this was not the cause of that miss, but finally I came to the conclusion that the points of the platinum contacts were not as they should be, so I took out the offending vibrator spring and with a good glass I found the points on both contacts were badly pitted; in fact, there was a small hole in the contact on the vibrator spring, while the seat had been badly marred by the improper use of the tension spring screw in the adjusting of the vibrator.

With a light hammer I carefully rounded up the contact and seat of the platinum points, carefully finishing the faces with a smooth fine file, and replaced the vibrator and seat. Turning on the current from the battery, storage, I was rewarded by a sharp sputtering from all the cylinders, which soon rounded out with a regular fire from each cylinder, entirely eliminating the vibration which was set up by the missing cylinder. This is the cause, I am most certain, in many cases where a miss is hard to locate, and a regular inspection of the vibrator points on a car using a coil would save a lot of money, vexation and annoyance, and cost but little time and make a far smoother running motor.

Right here I will say that it is strange that the spark would come when on contact, through the plug, but in working under compression in the cylinder, only now and then one could be had. But as soon as the pits were taken out the vibrator worked perfectly.—A. D. Carpenter.

WORK OF LIGHTING GENERATOR

Aberdeen, S. D.—Editor Motor Age—What is the ampere output of the ward-Leonard dynamo used on the Cole this year?

2—These cars are now equipped with 6-volt, 16-candlepower headlights, and 6-volt, 4-candlepower side and tail lamps, all Mazda tungsten lamps. Would it be practical to use 21-candlepower lamps for headlights with the same reflectors and dynamo? The 16-candlepower headlights do not furnish sufficient light for fast travel at night.

3—How many amperes does the Ward Leonard dynamo produce at 10 miles per hour speed on the Cole care with 36-inch wheels?

4—What is the speed of the dynamo, revolutions per minute, when the car is traveling at 10 miles per hour?—Old Reader.

1—The Ward-Leonard lighting dynamo as used on the current Cole models has an output of 10 amperes and 20 volts at 900 revolutions of the engine or 1350 of the generator per minute, corresponding to a car speed of about 20 miles per hour.

2—Yes.

3—The output under these conditions is 7 amperes.

4—At 10 miles per hour, on high gear, the Ward-Leonard dynamo as installed in Cole cars turns at 660 revolutions per minute.

CONCERNING CHURCH STARTER

Westfield, Mass.—Editor Motor Age—Is the self-starter made by the Automatic Motor and Engineering Co. made so that it can be used on any motor, or is it an integral part of a motor they make?

2—What kind of an automatic pump is used on or in connection with the starter made by the Geiszler Storage Battery Co.?

3—The principle of these two starters seems to be the same—what is the material difference?

4—Could Motor Age inform me the number of patents on these two starters or tell me where I could find out?—A Reader.

1—The self-starting feature of the Church motor, manufactured by the Automatic Motor and Engineering Co., is a structural feature of the motor and cannot be applied to any other.

2 and 3—No information obtainable on Geiszler starter.

4—Church patents of the Automatic Motor and Engineering Co. have been pending for 2 years and are not yet issued.

CEMENT INNER LINERS

Edgerton, Wis. — Editor Motor Age — I have two old inner liners that I have used for 2 years in different casings. Can you tell me the best way to put liners in new casings now and make them stay tight so they will not heat up the tubes? The sticking quality has gone to some extent. —A. T. Earle.

Liners should be cemented to casings with any good tire cement, and in the same manner that such cement is usually applied. The inside of the liner should be powdered with French talc before inserting the tube.

Rambler Regulation

Adjustments of Clutch and Steering Gear of Kenosha Car and Hints on Tires and Brakes

RED LODGE, MONT.—Editor Motor Age—Can Motor Age show by illustrations or diagrams how to adjust the steering gear and clutch of the 1912 Rambler Cross-Country five-passenger car?

2—When starting the motor, after it has been at rest for a day or so, we have to crank several times before it will continue to run. It fires several times, then dies. It runs fine after warmed up, but takes considerable coaxing to induce it to continue long enough to warm up. Can Motor Age suggest a remedy?

3—Can any one use a gasoline vulcanizer with success—that is, one that is commonly sold for from $3 to $5?

4—We have several punctures on inner tubes, and as there is no repair shop near us, we would like to repair the tubes and use them again, but some persons have told us that the patches that are cemented on will come off when the tire becomes hot. Is this so, or will the patches that are cemented on give better service than vulcanizing by an inexperienced hand?

5—In descending a long hill, should one use both the foot and emergency brake or just the foot brake?

6—Do the Goodyear people warrant their tires for any length of time or mileage?

7—Does this warrant cover defects or blowouts?

8—How long or how many miles should a motor car be run before refilling the transmission and differential cases with grease?

9—In jacking up a car for the winter, to relieve the tires of air pressure, should the jacks or supports be placed under the springs or on the outside of the wheels?

—Troubled Motorist.

1—The Rambler clutch is of the expanding shoe type, consisting of a main clutch shoe, extending about three - quarters around the interior circumference of the flywheel, and a small cushioning shoe, for the purpose of softening the action of the clutch; which extends around about an eighth of this circumference. These shoes are expanded by means of toggle levers, with adjustable toggle arms. These adjustments consist of nuts which, when turned, to elongate the toggle arms, cause the clutch to engage with more pressure, and vice versa. To make the clutch softer, the smaller clutch may have to be expanded more, as if it does not take hold before the main shoe, the rather sudden engagement of the latter will cause the action to be harsh. On the other hand, if this does engage before, it may be adjusted for too sudden engagement, so that the harshness may be traced to the primary shoe. Fig. 4 shows this clutch.

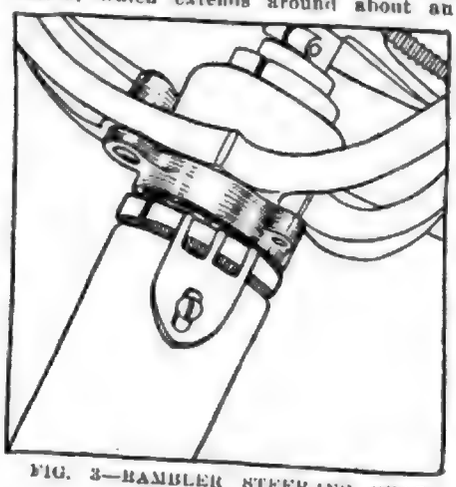


FIG. 3—RAMBLER STEERING GEAR ADJUSTMENT

If the clutch does not let go easily, either of these two members, probably the main shoe, is being expanded too far, with the result that with the pedal fully depressed the clutch is hardly out of engagement. If the clutch slips when pulling hard, the action of the main shoe is too soft. These adjustments must be made at the same time, and are to be judged by the effect produced. The pedal operates these toggle levers by means of two rods, linked to a thrust bearing collar, to which the toggles are connected. To insure free pressure of the spring, these levers should be adjusted so there is just a little play in the clutch pedal, when the clutch is engaged. To insure complete disengagement, the shoes should be free of the wheel before the pedal is fully depressed. These adjustments are made by means of turnbuckles on the connecting rods between the clutch pedal shaft and the thrust bearing collar.

The Rambler steering gear is of the screw-and-nut type, the chief difference between it and others of the same type being in the location of the thrust bearing that takes the thrust from the screw. This is located on the steering column, just below the wheel. It consists of a screw collar which is locked in adjustment by the locking device shown in Fig 3. This consists of a sliding finger-set that engages with milled slots in the adjusting nut, being held so by a set screw, within a slot, which when loosened permits the finger or fork to be slid down out of this engagement, to permit of the adjustment of these members, to take up wear. This is the only adjustment. Turning the nut to the left takes up what play may exist in the thrust.

2—Hard starting in a cold motor is to be expected, but the stopping of the motor, once started, is to be attributed to a lean mixture. With your motor running slow, cut down your low-speed air until the motor begins to slow up, then turn it back a half-turn.

3—These devices are of such recent introduction that Motor Age has not yet had an opportunity to test out their merits. They seem to be finding favor with many users.

4—The practice of cold-patching is quite general, and usually successful. A patch

properly applied should last as long as the tube. Vulcanization, however, is better, as in severe use it will stand more heat than a patch. After standing in the tires for some time or lying in the tool box for some time, the cement of patches sometimes dries out, necessitating a new patch or recementing. A good patch is certainly better than a poor job of vulcanization, but with the acid cure and other cold vulcanizing outfits that are now on the market, there is no reason why any man of ordinary skill should not be able to make a good repair of the latter kind.

5—The safest rule in descending long grades is to use the emergency or hand brake, which can be locked in partial engagement, requiring no further attention, and giving a steady pressure on the drums, much better for the car than the irregular pressure that even the most careful operator would exert on the foot brake. The chief reason for the advisability of this lies, however, in the fact that the term emergency, as applied to the hand brake, is at best a misnomer, as the foot brake is the one reliance of the driver in case of an emergency, when there is no time to reach for a lever and bend forward in the seat, both hands being required to guide the car, then, if ever. For this reason, it is best to use the foot brake sparingly; stopping dead with the hand brake, which is always applied in leaving the car, by careful drivers; and avoiding such strains and excessive wear as the foot brake would be subjected to in long coasts.

6—Goodyear tires are warranted against defects in material or workmanship that may develop in 3,500 miles of running.

7—This warranty covers any trouble resulting from the above defects.

8—This varies with different cars, the average being about 5,000 miles.

9—Preferably between the wheels, as, if placed outside, they consume more space than necessary, and are liable to be knocked over in passing.

GEAR RATIOS AND HORSEPOWER

Baton Rouge, La.—Editor Motor Age —What is the gear ratio of the 1912 and 1913 Rambler cross-country on high?

2—What is the speed of this car?

3—It is rated at 38-horsepower, but what is the horsepower developed by this car?

4—What is the gear ratio of the 1912 Chalmers 36?

5—This car is rated at 36-horsepower, but what is the horsepower developed by this car?—A. J. Lanier.

1—The gear ratio on both is optional, 3½ to 1, or 4 to 1.

2—This car is said to be capable of 55 miles per hour.

3—The rating of 38 horsepower is derived from brake tests at 1,500 R. P. M.

4—The gear ratio in high gear is 3¾ to 1.

5—The rating of 36 horsepower is based on brake tests, at 1,000 R. P. M.

To compare the powers of these motors their tests at equal speeds are requisite.

Peculiar Piston Pound

Bucking Buick Baffles Bewildered Southern Motorist Who Fears Expense of Renewing Parts

TEXARKANA, ARK.—Editor Motor Age—I am driving a model 10 Buick and I am having trouble with the two front cylinders missing on low, running very rough, not knocking but running as if some bearing were loose and rattling around. The noise seems to be in the crankcase, but I have had the lower half taken down and all main and connecting rod bearings drawn up snug; there is no perceptible movement when an iron bar is put under the flywheel and lifted up and down. The only thing left to do is to take off the front two cylinders and look for broken or weak springs or badly working rings. In the event that I find the two cylinders are worn out of true what can I do with the least expense to restore compression? I do not care to go to the expense of having cylinders reground and pistons fitted, neither do I care to buy new cylinders and pistons, etc. Will the fitting of stiff new rings upper and lower restore the compression?

This engine is fitted with a model L Schebler carbureter which gives plenty of gas and which has been recently cleaned and adjusted. If Motor Age can suggest a remedy I would be very willing to follow your suggestions.—X. Y. Z.

1—There are a variety of causes that could be responsible for the noise of which you complain. If you are sure that the bearings, including the wrist pins, are in perfect order, examine the valve action. See that the valve tappets have not too much clearance over the cams. If you find nothing here take off the offending cylinders and examine them for broken or worn piston rings, and see that you have compression in all cylinders. In case any of these parts need replacement, by all means spare no expense in putting in good parts, for you will find that a few new rings or a new piston is far cheaper than a new cylinder, such as you might be forced to put in if a broken ring scored it. If the cylinder is badly worn out of round or scored, either replace it or regrind it, according to the cost and general promise of life. If the latter is done, new piston rings will be needed, and probably in a much used engine, new pistons. Extra heavy rings, if properly applied, should work very satisfactorily, if nothing worse than natural and legitimate wear has taken place in the cylinders or on the rings and pistons. Nothing but a thorough inspection can determine this, however, and Motor Age can only suggest that whatever course you pursue, you employ the services of a competent expert, if you do not feel yourself sufficiently adept; and if the car is worth anything at all strive for permanence in such repairs as you make.

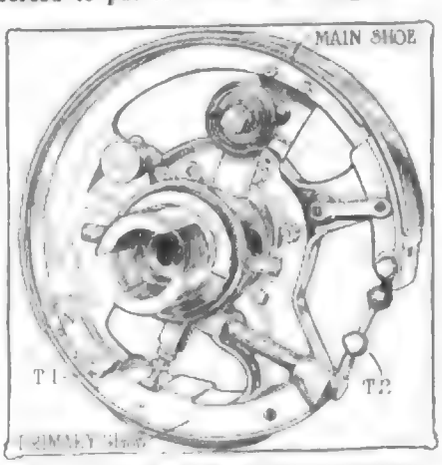


FIG. 4—ADJUSTMENTS ON RAMBLER CLUTCH

GARFORD PERFORMANCE

San Francisco, Cal—Editor Motor Age —1—What is the weight of the Garford Six?

2—How many miles per gallon will it travel?

3—What is its best speed?

4—What was the size of the engine used in the Thomas Seventy?—G. W. Fuller.

1—The chassis weighs 3,050 pounds, and the seven passenger touring car, 4,200 pounds.

2—About 9 miles to the gallon.

3—About 65 miles per hour.

4—Six cylinder, 5½ by 5½ inches bore and stroke.

BEST ECONOMY AT MODERATE SPEEDS

Virginia, Ill.—Editor Motor Age—1. What should be the condition of the compression chamber in a motor when working to best advantage? Should the piston head and compression space be dry and sooty, or in an oily condition?

2. Will a car consume more or less gasoline running at a speed of 60 miles per hour, or at 20 miles per hour going the same distance?—G. W. Rexroat.

1. By all means the combustion chamber of an internal combustion engine should be well lubricated. Never let carbon, or in the above phrasing, soot, remain in it. As much oil as can be used should be in the cylinder at all times. The maximum being the greatest amount possible without smoking.

2. This question is not specific. Provided the speeds of 60 and 20 miles per hour are both made on the same gear, that the spark in both cases is carried reasonably advanced, that the car in both cases is correctly adjusted, and that the distances covered are over the same or similar routes, a car going under these conditions at 20 miles per hour will show more fuel economy than if it were going at 60 miles per hour. A speed of about 30 miles per hour gives the best economy on the average car with good road conditions.

The type, adjustment and adaptability of the carbureter to the motor are features that must be considered in this, as some carbureters are made for speed without regard to economy, and vici versa.

Observations on Motor Truck Tires

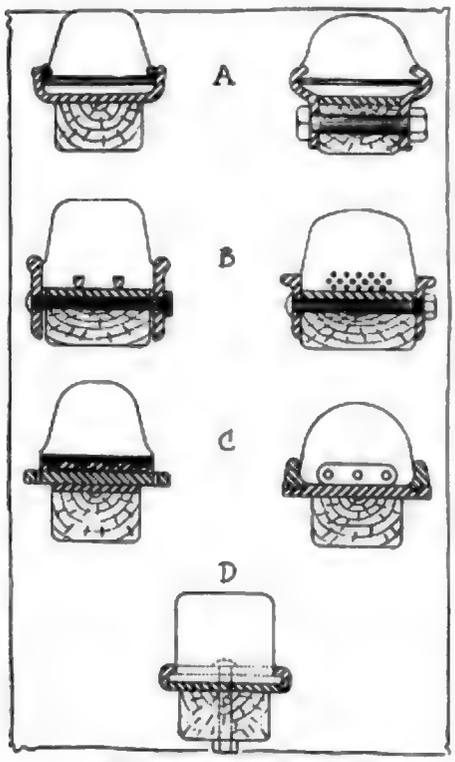


FIG. 1—TYPES OF TIRES

EVER since the dawn of civilization when ancient man was forced to stand in his chariot for the sake of comfort, man has had before him the problem of devising means of increasing his comfort by reducing the shocks and jolts transmitted to his anatomy from bumps and inequalities of the road. The gradual evolution of the power vehicle, from the simplest kind of a cart with the crude wheels tired with skins and later with bronze and then with iron, progress has been made in small steps until we are brought today to the self-propelled vehicle in its well-nigh perfected state.

Question an Economic One

The question of tires has from the first been an economic one, the ancient using the best means available to prevent his wheels falling apart, as is the case today. The tires for self-propelled vehicles, or, to narrow it further, for motor trucks, put before us a problem which is one of the most important in the industry, and which, up to only a short time since, has retarded its rapid advancement. The problem before the builder of horse-drawn vehicles is simply what material will give the longest service at the lowest cost, and the solution has been plain steel band securely attached to the wood wheel. The motor car builder immediately finds his tire question a much harder problem to solve. In the case of the ancestors of the modern truck, the steam roller and traction engine, which move at very slow speeds, steel tires were amply sufficient for the requirements, but when it was attempted to increase the

EDITOR'S NOTE.—The following paper on "Some Observations on Tires for Commercial Vehicles" was presented to the Philadelphia branch of the Society of Automobile Engineers by F. E. Whitney.

speed and use motor vehicles for carrying loads, it was very soon learned that something was needed at the surface of the road to absorb some of the vibration and at the same time furnish sufficient traction without cutting up the road. So, from trials with steel, wood, leather and everything else imaginable, the use of rubber has developed into a necessity. The success of the bicycle was assured the day pneumatic tires were made successful. So with the commercial motor vehicle, its position as a factor in business was established as soon as a tire that had the necessary qualifications was produced.

The object of this paper is simply to bring out some interesting points noted in studying the various types of truck tires on the market, the effect of load upon them and some rather peculiar characteristics. As my experiments have been confined to vehicles traveling at speeds below 20 miles per hour, we have not considered pneumatic tires as entering the field. The various makes of tires now on the market may be divided into four distinct types as shown on Fig. 1.

Type A—Side Wire—Uniform compound throughout attached to wheel by means of cross wires embedded in rubber at base and secured to wheel by side wire or side flanges. Characteristic makes of this type—Firestone, Swinehart.

Type B—Wire Base—Uniform compound having several wires embedded in rubber at base running around wheel and secured to wheel by press fit on band and side flanges. Characteristic makes of this type—Diamond, Kelly-Springfield, Hartford.

Type C—Hard Rubber Base—Soft rubber tread, hard rubber base vulcanized to steel bands and secured to wheel by press fit and side flanges or T bolts. Characteristic makes of this type—Gibney, Goodrich, Polack, Goodyear.

Type D—Block—Separate blocks secured by cross or side wire and metal cages over blocks bolted through felloe. Characteristic makes of this type-Kelly-Springfield and others.

In considering the value of different makes of tires for use on commercial vehicles there are a number of features to be taken into consideration which will depend somewhat upon the type of vehicle on which the tires are to be used. These characteristics can be classified as follows: Efficiency, durability, resiliency, weight, cost.

In determining the value of the different characteristics to the truck manufacturer I have arranged these in the above order as representing the order of their importance to the manufacturers of electric vehicles. On account of the different nature of other types of vehicles the relative importance of the different characteristics of the tire is frequently placed in the following order: Durability, cost, weight, resiliency, efficiency.

In making observations a number of tests have been made on various makes of tires, the size used being 3 inches by 36 inches. This particular size was selected because of ease in handling, loading, etc. The standard load rating of this tire is 950 pounds, but tests were carried up to 1,500.

Road Surface Resistance

In rolling a wheel along the road over any surface there is a resistance to rolling depending on road surface and type of tire, which varies all the way from 3 pounds per ton with true steel wheels rolling on heavy clean rail up to 200 pounds per ton in ordinary wagon wheels through sand. The best authorities give the following figures:

Steel-tired wheels on steel rail...	3 to 5 lbs.
Pneumatic-tired wheels on asphalt pavement	15 to 35 lbs.
Solid-tired wheels	20 to 40 lbs.
Steel-tired wheels on average road, about	50 lbs.

The most efficient rubber tire is naturally the tire that will roll along and offer the least resistance to rolling. In rolling over the relatively hard road surfaces the softness of the rubber allows it to spread, giving more surface in contact with the road; as against this the steel tire retains its shape, making an indentation in the road as it rolls along. As the composition of the road is not as efficient a spring as

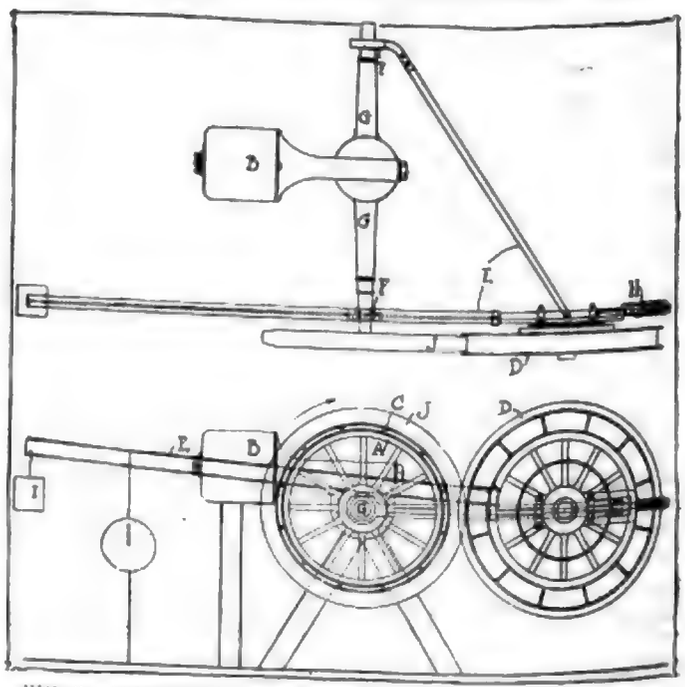


FIG. 2—APPARATUS USED FOR MAKING EFFICIENCY TESTS

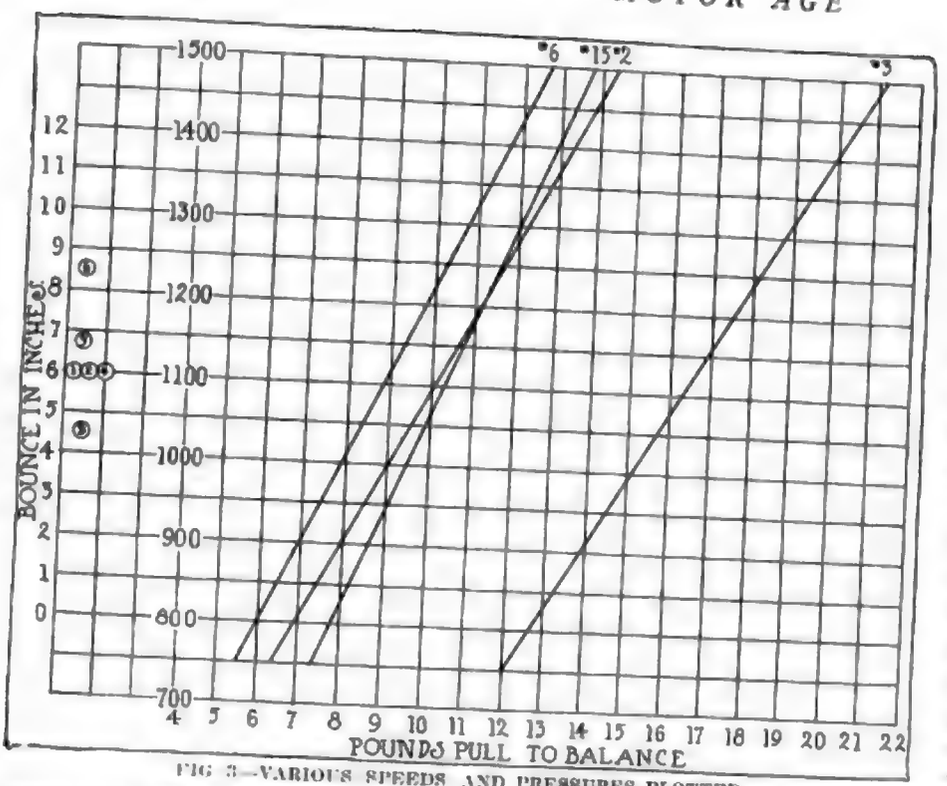


FIG. 3—VARIOUS SPEEDS AND PRESSURES PLOTTED

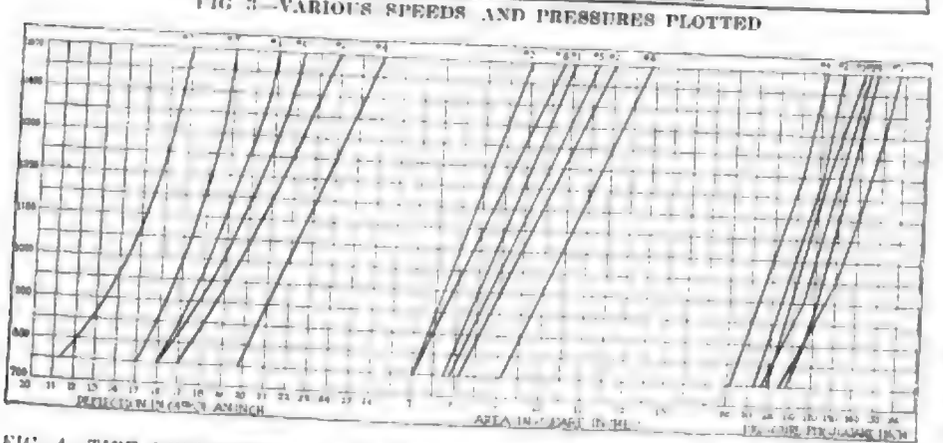


FIG. 4—TIRE DEFLECTORS. FIG. 5—PRESSURE PLOTTED AGAINST POUNDS. FIG. 6—PRESSURE PER SQUARE INCH AGAINST POUNDS

the rubber tire, the road resistance is naturally higher.

In making tests on trucks with different makes of rubber tires results have been secured where the total resistance has run as low as 25 pounds per ton and as high as 60, all other conditions remaining the same except the tire. This is simply due to a variation in the compound of the rubber, the low results being with a very high quality of rubber, whereas the high results were due to an inferior compound. Of this the loss in transmission amounts to approximately 3 pounds per ton, friction and windage 5 pounds per ton, the remainder being in the tires.

Methods of Test

In order to test for efficiency we make use of several methods:

First—By allowing the vehicle to coast down a grade and determine the distance it will run, this being repeated with different makes of tires. The more efficient tire will naturally coast further.

Second—Run the vehicle over a measured course and with electric instrument and stop watch determine the power consumed per mile per hour, this being repeated with different makes of tires.

Third—The more accurate test has been with the use of a dynamometer on which the tire to be tested is mounted and rolled against a plain steel band. The resistance to rolling is determined in pounds at various speeds and pressures.

Fourth—The fourth and very simple method is to follow the system used in the Shore scleroscope for testing steel, which simply consists in dropping a piece of hard material on the tire from a definite height and measuring the height it will rebound, the efficiency of various tires comparing with the height of rebound.

Fig. 2 shows in plan and elevation an apparatus which we have devised for making these efficiency tests. It consists of the rear construction of one of our worm-driven light delivery wagons. By means of a special driving shaft the differential is locked so that a wheel mounted on one end of the axle at A will be driven from the motor B in the same manner as the vehicle operating on the road. This wheel is made small enough so that a 36-inch tire mounted on its steel band will slip over the outside. The rim of this wheel is fitted with a number of set screws C, so that the tire can be readily centered and secured in position, after which it is securely wedged. Steel-tired wheel D, mounted on annular bearings, is carried by frame E so mounted that it swings readily on the annular bearings F of the axle G. The wheel D is mounted so that it can be moved in or out and it can be pressed against the wheel to be tested by means of the coil spring H. The wheel D with its supporting frame E is counterbalanced by the weight I. It will be seen that by revolving the wheel A in the direction indicated by the arrow with no pressure between the tire to be tested J and the wheel D, there will be no tendency to rotate the whole apparatus about the center of the axle G. When, however, pressure is applied, any resistance or drag at the surface of the tire J will be resolved into a tendency of the whole system to rotate about G and this is determined in pounds pull by means of the spring balance K. In addition to the apparatus indicated the wheel is fitted with a speedometer so that tests at different speeds can be made. In this manner a range of tests has been made at varying speeds and pressures and the results plotted in curves as shown on Fig. 3.

Tire Losses Vary With Load

It will be noted that all of the curves are practically straight lines, showing that the tire loss varies directly with the load. By referring to curve 3 and curve 6 it will be noted that at 1,250 pounds the drag on tire 6 is 3-10 pound, as against curve 3 showing a drag of 18 pounds, which represents the relative efficiency of the tires.

As a direct comparison with the above method of test, the bounce in inches of the same tires has been plotted, as shown at the left side of Fig. 3, from which it will be noted that tire 6 shows a bounce of

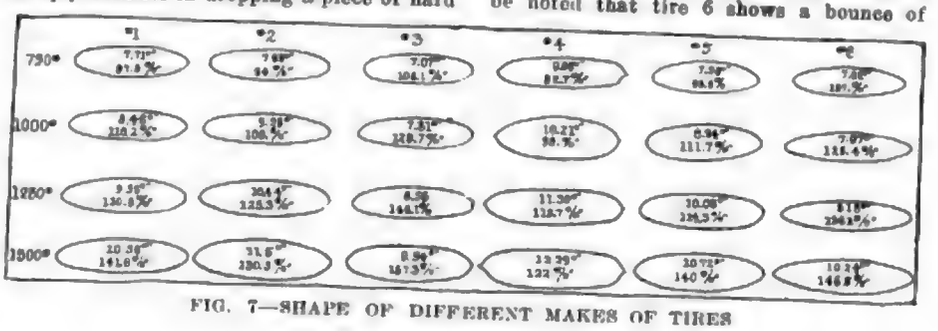


FIG. 7—SHAPE OF DIFFERENT MAKES OF TIRES

8½ as against 4½ for tire 3, showing about the same relative efficiency with the different method of test.

As indicating the effect on the mileage secured from one charge of the battery in an electric truck with the extremes as indicated by tires 3 and 6, a vehicle equipped with tire 6 would cover, say, 50 miles on one charge of the battery, whereas a vehicle equipped with tire 3, over the same route, and using the same battery equipment would be able to cover only 30 to 35 miles.

Cushion Effect

The amount of cushion which the tire interposes between the wheel and the road is an important factor in the value of the tire as measuring the amount of injurious vibration and shocks which are absorbed. In order to determine this effect tires were given various loads and observations taken of the compression of the tire; also of the area in contact with the road. From these observations curves have been plotted showing the load characteristics of various makes of tires and also the contact with the road and the load per square inch of the surface in contact.

Fig. 4 shows a series of curves in which the deflection of the tire in sixty-fourths of an inch is plotted against load in pounds. This test is made by pressing the tire between two parallel surfaces and simply measuring the compression in inches. It will be noted that on curve 3 with a load of 1,250 pounds a compression of 16/64 is shown, as against 24/64 on curve 4. In other words, on a bump tire 4 will compress 50 per cent more than tire 3, and, consequently, absorb proportionately more vibration.

In Fig. 5 pressure is plotted against pounds.

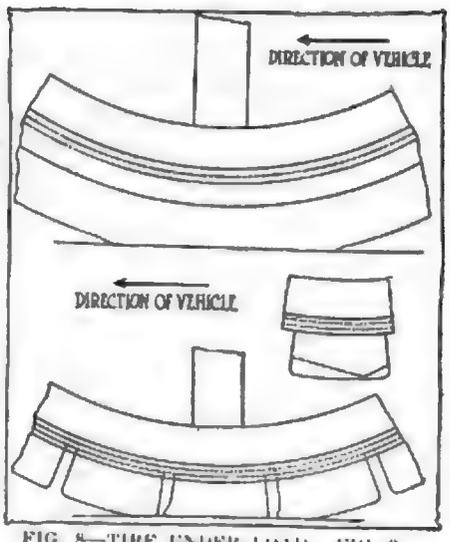


FIG. 8—TIRE UNDER LOAD. FIG. 9—EFFECT WITH BLOCK TIRES

In Fig. 6 pressure per square inch is plotted against pounds.

It will be noted that the area in contact with the road varies with the different makes of tires from 8 6/10 to 11 3/10 square inches. This, however, does not indicate much unless the pressure per square inch is taken into consideration.

Pneumatic tires are usually worked at about 75 to 90 pounds per square inch. It will be noted by Fig. 6 that at 1,250 pounds solid tires are working at pressures of from 115 to 145 pounds per square inch. The wear on the solid rubber and the service it has to perform are considerably more severe than in the case of pneumatic tires.

Carrying Capacity

Referring to Fig. 4, it will be noted by curve 4 from the direction of the curve that at even 1,500 pounds the tire has not reached its full capacity, whereas on curve 3 the deflection is not increasing in proportion to the added weight, and, consequently, this tire is close to its carrying capacity. This shows that although the tires all have the same rating there is a decided difference in the actual carrying capacity.

As a matter of interest along with other observations the shape of the different makes of tires was observed as is indicated on Fig. 7, on which are also noted the load per square inch at contact with the road and pounds pressure per square inch on the tire.

There is a point of interest to which my observations did not reach, the maximum pressure at the center of the area in contact with the road, the pressure indicated being simply the pressure per square inch calculated from the pounds load and the total area. It is reasonable to expect that some of these indicated figures will be increased materially, the result being that the tire is etched away in the center of the tread and has a tendency to flatten out on the surface; this is what actually occurs in service.

Fig. 8 is made to show the shape of the tire under extreme load. It will be noted that there is a slight wave in the rubber at both the front and the back of the area of contact with the ground. When the vehicle is moving this wave is in front and of increased height.

I have shown in Fig. 9 the effect which is obtained with block tires. It is interesting to note that usually the first idea is that the heel of the blocks is worn out first, but, as a matter of fact, the toe is worn more on account of its creeping out from under the load as the wheel revolves. The dotted line indicates the shape the blocks assume after having been in service.

ENGLISH STARTER EXPERIMENTS

LONDON, Eng.—Editor Motor Age—In view of the interest taken in self-starting devices, I have been carrying out a series of personal trials with the various types now prevalent. There are five principal types.

1—Compressed air, with a compressor, air tank, distributor valve, and all of the other necessary adjuncts, made as part and parcel of the car when designed, with pressure up to 500 pounds to the square inch.

2—Spring types, which automatically rewind, once the motor is started.

3—Compressed air types in combination with carbureted air, with pressures up to 100 to 150 pounds to the square inch.

4—Acetylene gas types using compressed acetylene gas, which is injected into the cylinders, and afterwards ignited by a spark from the coil or magneto.

5—Electric types, consisting of a small electric motor actuated by a battery of accumulators.

These five devices seem to me to cover

Manufacturers' Communications

those which may be considered in the practical way today. I find all have disadvantages, some serious, and some less so. None of them would give satisfaction after a year's use, and all of them require a considerable amount of care and intelligence to keep them working properly, and as a whole, speaking from personal experience, I find their disadvantages to be infinitely greater than their advantages, but one cannot help recognizing that the day must come when engines will be automatically started from the seat with certainty, without material expense or weight being added to the car, and without such complications as at present exist, which almost requires a trained man to keep them in order with the little incidents which seem to occur.

Practically all of these devices have shown that from a point of view of demonstration, they will start a car certainly and successfully hundreds of times a day, and keep on doing it, I daresay for many days on end, but that is quite another story to starting the car when it has been standing for some time, and is hard to start with the starting crank. It is under these circumstances that the starter is most wanted, and behaves the worst.

Now to deal with the disadvantages of the various types: The compressed air type has the disadvantages of excessive weight and expense, the workmanship has to be perfect, and even then requires a skilled person to keep the installation in order. The spring type is on the face of it the simplest to operate, and very certain in action when the engine is able to turn over, but once trouble does start, and owing to its complication, it is a certainty that it will, only a skilled mechanic will be able to put it in order. The compressed carbureted air type is excellent in many ways; the pressure is not high, the installation is not so expensive as others, but its disadvantages are that it requires a coil or special starting magneto to start, and as the engine

does not always stop in the sparking position, so that in a certain percentage of times it fails. I look on the acetylene type only as a passing phase, as compressed acetylene, I think is illegal in England, and there is no question but that it is dangerous. It also has the disadvantages of the compressed carbureted air type. Electric starters, on their face seem an ideal method of turning the engine over. But to turn over a big engine that has been standing all night in the cold requires a large amount of power, and the installation, in common with the others is heavy, and if installed in the best way undoubtedly would be expensive. I think it is a reasonable proposition for small cars, provided the cost is not objected to, but when one remembers the trouble attendant upon the use of storage accumulators, it can easily be realized what a state this mechanism would be after twelve months of use.

At present none of the devices which I have tried, and am trying, appeal to me from the private user's point of view, but anyone who is experimentally inclined will always be able to get the latest form of self-starter fitted to Napier cars, and he can feel it he does have troubles that he is doing good work for motoring as a whole because the self-starter will come, and it wants some private users to start experimenting so that every difficulty may be more rapidly found out than is possible under present circumstances with relatively few of us experimenting with these devices. At present I must say my own motoring would be infinitely more pleasant if I did not find it desirable and necessary from an experimental point of view to have different forms of self-starters fitted to my cars. Therefore, every firm which fits self-starters we look upon as doing good experimental work for motoring, and to those purchasers who buy them and put up with their vagaries, which certainly will occur sooner or later, I think a great debt of thanks is due from the motoring community as a whole.—S. F. Edge.

AGAINST DUAL TIRES

Indianapolis, Ind.—Editor Motor Age—After making some careful investigations and observations, I am fully of the belief that dual tires are not practical. Further, the origin of this type of tire was entirely due to the fact that early tire makers did not have the proper equipment for making single tires in sizes to take care of the roads. As you know, under average driving conditions, when the truck is not used in the sections most improved, the load is often carried by one tire or the other, so that you are really getting advantage only of the single smaller tire. If this is true, the load is being carried on one side of the wheel, and not so evenly distributed along the wheels as where a large single tire is used.

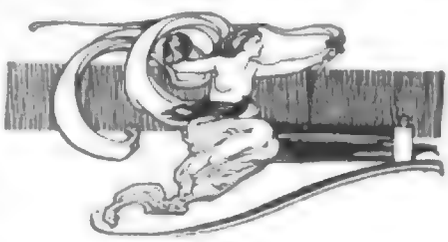
I can cite a number of cases in the east and some which have come under my notice here in the vicinity of Indianapolis, where truck users have found it necessary to change their tire equipment from dual to large singles. The roads in this locality are not improved as might be hoped, and driving outside of the city through the roads, all of the load comes on the outer tires, as they extend beyond the ruts of the standard tread. Admitting that the tire would be somewhat damaged even if large singles were used, this wear would be more evenly distributed over the entire tire, and possibly the cutting be from both edges, which would result in greater mileage.

All of the arguments which have been given me by the tire people in favor of the dual tire are of no consequence, in comparison with the advantages of the large single. So far as the manufacturer of tires or trucks adopting the proper standard in tire sizes, this would be impossible, unless in a case where careful study was made of conditions. In some cities tires will give a mileage up to 10,000 or 12,000, while in other localities the same car carrying about the same load will give only a few thousand miles. I cannot give you any solution for this problem, as it would be quite a hardship on the manufacturer of trucks should he endeavor to solve each individual problem, as it would necessitate the use of a great variety of sizes in wheels.—C. H. Wallerick, manager motor car department, General Indicator and Mfg. Co.

FUNCTIONS OF BREAKER STRIP

Akron, O.—Editor Motor Age—There are still occasional tire users who do not fully understand the function and purpose of the breaker strip, which lies along the tread of the Goodyear tire concealed by the tough rubber of the tread. The explanations occasionally given for the presence of the breaker strip are entertaining, to say the least. The breaker strip is put in a tire to take the shocks, which obstructions in the road are liable to give to a tire, before they can reach the organic part of the tire. It plays no part in the strength or efficiency of casing, but is simply an armor belt around the outside of the tire, to protect it from injury.

The body of the tire, to give the best results, is made of fairly closely-woven fabric, placed at an angle of 45 degrees. The tread rubber, to give the best wearing qualities, is made thick and tough, and while in service exerts a drag on the fabric, tending to pull it loose. The breaker strip should be put in with the threads running around the circumference of the tire, instead of at an angle of 45 degrees, as this more effectively takes up the shocks without transferring them to the carcass, and better resists the drag on the rubber pulling it away from the tire fabric.



When sharp stones or glass cut the tread rubber, in many cases the abrasion is stopped at the breaker strip, preventing the water and dirt getting down to the main fabric, thereby preventing the tire being water-soaked or sand-blistered to quite an extent. As the breaker strip is the nearest fabric to the road, it receives all the cuts, water, dirt and sand, and should be made, so far as possible, to resist damage caused by them. For this reason, we wish an open fabric which can be more effectively united to the rubber. On the other hand, we wish a closely-twisted yarn, tightly woven, to avoid becoming spongy when water-soaked, thereby letting go from the rubber. We believe that our rivet fabric is the best compromise between these two qualities, as it is made from closely twisted yarn, tightly woven, to make it as waterproof as possible, but leaving large holes at intervals, making a fabric which is more closely united to the rubber than any ordinary loose-woven fabrics, and at the same time time it is more waterproof after the tread has been cut.

Always bear in mind when you have breaker strip trouble that undoubtedly this has saved the tire from much more serious injury at a much more vital point in its construction. To obtain the best results from breaker strips, there should be a cushion of rubber between the breaker strip and the main fabric of the tire.—P. W. Litchfield, factory manager Goodyear Tire and Rubber Co.

ABUSING TRUCK TIRES

Detroit, Mich.—Editor Motor Age—The question of abuse of motor truck tires is nation wide. We could cite examples of overloading on every truck we sell. We have built a truck on which the name plate is 1 ton with 50 per cent overload. Every one is running overload, some running 2 tons. We are advising our customers to equip with heavier tires, 3½-inch front and 5-inch rear with an extra charge, which is meeting with very good favor.

As to over-speeding, we found it impossible to run a truck satisfactorily prior to equipping with governors. We equipped with governors the last year and find that our troubles have been cut in half. We are having no engine trouble, less tire troubles and less trouble all through the truck.

One of the greatest truck troubles is in the matter of the driver who does not try to steer clear of broken bottles and glass and does not try to avoid obstructions that would damage tires very much. His carelessness in this matter often results in considerable tire trouble.—W. L. Pulcher, general manager Federal Motor Truck Co.

The Motor Car Repair Shop

Drilling Piston Drains

ONE of the causes of excess oil in the cylinders that sometimes gives motorists a great deal of concern is the slipping of the lubricant past the piston rings. The usual course of procedure in this case is to fit new rings or pistons. This, however, involves considerable expense and often bothersome delay in getting the repair parts, and most owners are loth indeed to discard a piston or set of rings when the compression is good, and their condition, other than a slight undersize, is still good. A better way to prevent an excess of lubrication, after the oil level has been lowered in the crankcase as much as is safe, is to drill a series of holes in the piston, to permit the excess of oil that collects on the cylinder walls to drain back through the inside of the piston, where it will not be caught up on the next stroke and carried back again to the upper portion of the cylinder.

The operation, which is very simple, is shown in the accompanying illustration. The size and number of holes to be drilled in a piston to provide a drain for excess oil must depend entirely upon the amount of excess which they are expected to conduct. They must not be made too large or too numerous, especially near the wrist pin, as to do so would weaken the piston, and might drain too much oil.

Where there are from four to six pistons, in each of which from eight to sixteen holes are to be drilled, it will probably be advisable to construct a good clamp, to be secured to the drill-press table, for convenience and to prevent breakage of the drill, by accidental slipping of the piston beneath it. Such a clamp is shown in the illustration, being made of straight grained ½-inch soft wood. The base is made in three pieces, the uprights cut with V-shaped grooves, and the base screwed thereto. A clamp lever is linked to one of the uprights by means of two iron straps, bolted through to each piece. The lever may be shaped in the form of a handle for comfort, the longer it is made the better. The clamp surfaces are best lined with leather, cloth or other fabric, to make the grip sure.

This is clamped to the drill-press table in the usual manner, and the piston placed therein. The clamp should be on the top portion of the piston, to provide ample clearance for the drill and chuck. A ¼-inch twist drill is about the right size. The holes should be drilled on the spiral plan, thus providing an outlet for excess oil on all parts of the cylinder walls, and at the same time conducting the oil from hole to hole in a downward

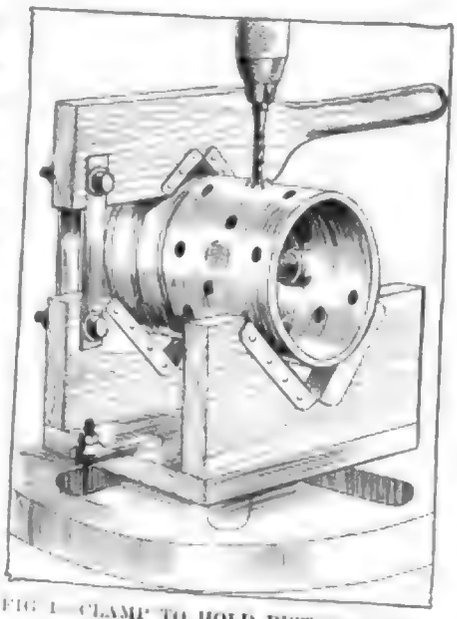


FIG 1—CLAMP TO HOLD PISTONS UNDER DRILL WHILE BORING OIL DRAINS

stream, to drip back readily into the crank case. To insure against overdoing this draining provision, it is perhaps advisable to make the first attempt conservatively, enlarging the size of, or increasing the number of holes later, if necessary.

Care must be exercised, in laying out the holes to avoid having any of the holes over the wrist pin, or too close to its bearings. A good way to plot the holes in this manner safely is to rub the piston with oil, the dirtier the better, and roll it once over in a piece of paper. This will give the development of the surface, and the holes may be much more easily plotted on the flat surface on the piston itself. On the flat plan, the holes can be laid out in straight lines, the plan cut and tied around the piston, and all the holes located at once by marking through the paper with a center-punch.

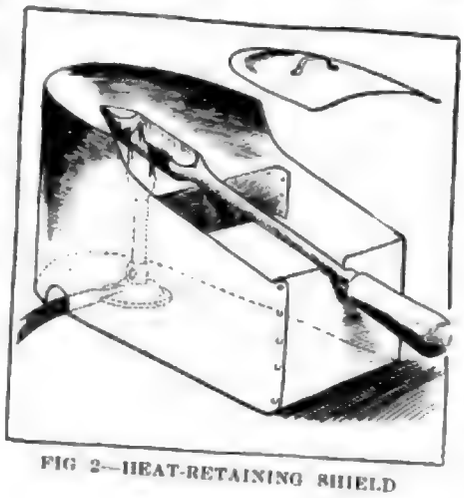


FIG 2—HEAT-RETAINING SHIELD

Simple Soldering Shield

AMONG the little things that help to expedite work by saving time may be mentioned the shield used for protecting the gas flame by which the soldering iron is heated in one of Chicago's repair shops. It is illustrated in Fig. —, and, as will be seen, serves the double purpose of affording protection to the flame from blasts of wind or drafts, and at the same time serves as a rest for the iron.

This shield is constructed of sheet iron, preferably galvanized, and can be made in a short time in almost any shop. It consists of three pieces, the main body of the shield and the two partitions. The main portion is a single sheet about 36 inches long and 12 inches high, cut down to about 9 inches width for about one third of the way from each end, and bent in a semi circle at its center. The outer partition is about 8 inches' square, and the inner one about 9 inches each way. The edges of the partitions are turned over and riveted to the main portion. The partitions cannot be soldered, as the heat may melt the solder, particularly at the connections of the inner partition. The exact dimensions of the shield will depend somewhat upon the height of the gas burner employed, but those given should serve the purpose in most instances and such variances as may be deemed necessary can be made from these as a working standard.

Where, as in most shops, a blow torch is used to heat the soldering iron, such an arrangement as that described will result in somewhat quicker heats, for it keeps the heat from being carried away from the iron by air circulation and to a certain extent concentrates the heat of the flame upon the iron by reflection. It is well to cut semicircular notches in the upper edge of the partitions to hold the shank of the iron. If desired, the heating can be hastened still more by placing the lid shown in the illustration over the shield.

Such a hood will be found to radiate considerable heat, and for this reason, it is well to screw it to an asbestos covered board, or to rivet it to a piece of metal with short legs, to prevent burning the bench. A bunsen burner may be secured permanently to this base, thus saving much annoyance from its shifting about within the shield. If a blow-torch is used, the shield may be mounted on legs long enough to raise it to the height of the torch, with an open bottom over the burner. The open bottom will permit of a draught, and as heat rises, will involve no loss of heat.

Gray Automatic Change-Gear Control

DIFFICULTIES of gearshifting have been removed by a device developed by Edward E. Gray of Plano, Ill., who, by the way, is the son of the famous inventor, Elisha Gray.

Instead of the usual handlever, operating the shifter rods of the gearset, this device uses a pneumatic selector which operates these rods as directed by a small controller wheel on top of the steering wheel. This controller is mounted on a stationary pillar disposed within the steering column, and is marked with the four speeds with a neutral at either end. A stationary arm over the wheel indicates the gear by a square aperture, through which the marks are read, and above which a miniature electric lamp is placed to illuminate it at night. The action of the selector is governed by the clutch pedal, which is connected with an air distributor valve, constituting part of the selector assembly. Air is taken from a storage tank, supplied by an air pump driven by the engine. The gearshift lever and quadrant is dispensed with.

Referring to Fig. 2, the complete installation is shown. At C is the controller, as shown in Fig. 1, being connected by a shaft internal of the steering column through bevel gears and a shaft to the selector at S. This selector is mounted on the front of the gearset case, G, and connected to the clutch pedal arm by the rod R which actuates valve, V. At the right of the figure the selector mechanism is shown in detail section. At S S are shown the shifter rods of the gearset, which are cut to form racks. At I I are shown idler racks, which are differentially geared to the lower shifter racks by means of the gear pinions, G G. At the extremities of all four racks are slots, in which the selector finger engages as revolved. This selector finger is integral with the piston rod, PR, the piston, P, and the controller long pinion LP. This assembly revolves within the stationary cylinder C, as directed by the gearing from the steering wheel controller. The purpose of the idler racks is to transmit a pushing motion to the shifter rods, when drawn forward by the selector finger on the forward or engaging stroke of the piston, to correspond with the forward slots of the ordinary H-plate system. The reverse action, pulling the shifter rods forward, is accomplished by the direct engagement of the selector finger with the shifter rod slots.

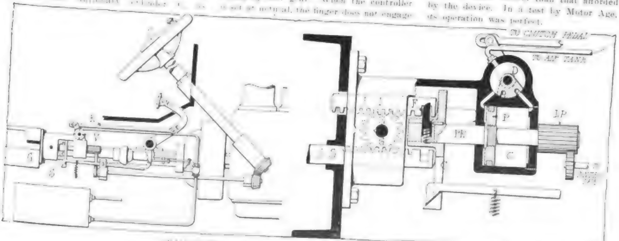
CONTROLLER SET FOR REVERSE

At D is located the air distributor, which is controlled by the clutch position. With the clutch engaged this valve is closed; when the clutch is just disengaged, the valve is in the position shown, admitting air behind the piston, and forcing it back. At C is the neutral collar, which is integral with the piston rod PR, and which on its back stroke throws the forward rod back even with the rest, which draws any engaged gear out, producing neutral. A further depression of the pedal closes this port, and the valve registers with the opposite one, forcing the piston forward, the finger drawing the rod selected by the position of the controller forward engaging that gear. When the controller is set at neutral, the finger does not engage any of the gears. The selector finger is in the form of a latch, so that when the controller is moved, when in gear, it is turned out into the adjacent space, engaging with the indicated rod, when the gears are thrown into neutral by the above described valve action, by a latch or ratchet action.

A pressure of 15 pounds is required as a minimum to operate the device, 40 pounds being recommended. Very little air is required to operate it, pressure being the prime requisite. As the manual connections consist of only a rod connected to the clutch pedal arm, and a small mechanical stop to prevent release into neutral on the engaging stroke of the clutch pedal, no appreciable extra pressure is required in its operation.

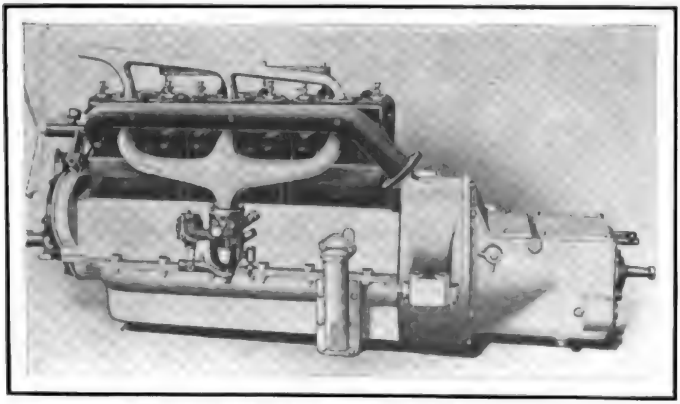
With these controls it is possible to accomplish a change of gear in a fraction of the time required by even the most skillful operator, using the usual method. No more effort is required to change gears than to operate an electric, progression through the gears for quick getaway, as required in traffic, may be made silently, and as rapidly as the clutch pedal can be depressed; the controller may be moved to a lower gear, on ascending a grade, ready to shift at the crucial moment, by a simple depression of the pedal. Neutral may be reached with the controller in any speed, by depressing the pedal half way, thus making it possible in slow running in traffic to change from neutral to first or vice versa by manipulation of the pedal alone; and finally, because of the correct order of precedence in gear shifting, damage to the gears is impossible, except through to sudden application of the clutch or wrong selection of gears, which are, of course, external causes.

A car was equipped with this appliance a year ago, having since been run with it for 10,000 miles, without a change-gear lever, or other control than that afforded by the device. In a test by Motor Age, its operation was perfect.



GRAY AUTOMATIC CHANGE-GEAR SYSTEM AND SELECTOR

Six-Cylinder Added by Cole Company



LEFT SIDE OF SIX-CYLINDER COLE MOTOR

THERE are two noteworthy features in the Cole line for 1913 known as series 8. The chief of these is the production of a six-cylinder car and the other is the adoption of the Delco combined system of electric lighting, starting and ignition. Three chassis models comprise the series for next year. These are known as the 60, which is a six-cylinder chassis; the 50, which is a refinement of the car marketed last year, and the 40, a small four-cylinder car. The general sizes of the three cars are as follows:

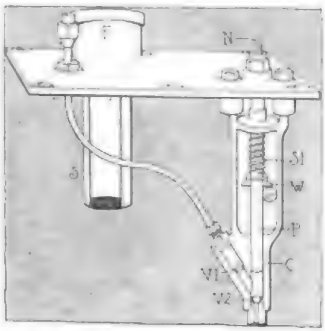
Model	No. Cyl.	Bore Inches	Stroke Inches	Wheelbase Inches	Tire Sizes Inches
60	6	4⅛	4⅝	132	37 by 4½
50	4	4½	5½	122	36 by 4
40	4	4⅛	4⅝	116	36 by 4

Features of the Chassis

The three chassis embody identically the same construction, are built of the same quality of material and differ only in dimensions and power. The general features of design which have characterized the Cole cars in the past will be retained. These features include three-point suspension, unit power plant, cylinders cast in pairs, Timken floating rear axle and Timken I-beam front axle, cone clutch, three-speed selective gearset running on ball bearings and double drop frame.

Taking the Cole 50 model as a standard from which changes can be observed there will be noticed several alterations in design.

Aside from the change in the electrical system, which will be described in detail later, the chief alteration in the general mechanical design is in the fuel supply system. The gravity fuel feed, formerly employed, has been abandoned, and an air-pressure system installed. The fuel in the new cars is supplied from an air pressure tank at the rear of the car, the pressure being obtained from a cam-driven pump. The carburetion is changed, in that the new model O Schebler carbureter is employed. This is a double-jet construction with an auxiliary nozzle that cuts in at high speed. The new carbureter is simplified in that there are only two adjustments, the cam adjustment used on the model L is done away with.



COLE OIL PUMPING ASSEMBLY

Three Chassis Put Out by the Indianapolis Concern for 1913

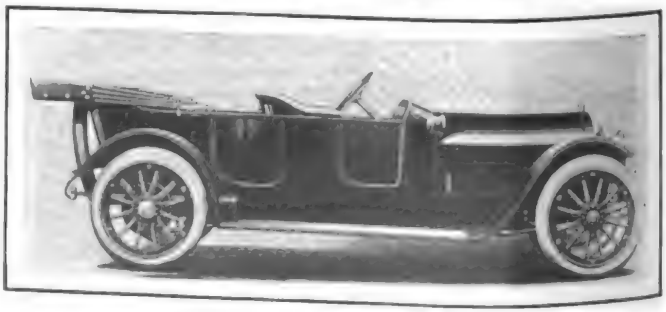
In order to give a lower center of gravity and to admit of slightly more room in the tonneau, a drop of 2 inches has been given the frame just back of the dash. This also serves to lower the front seats a trifle. Running boards are clean except for the battery box on the right side. A tool kit has been installed under the front seat. Special attachments for the name plate and license number have been provided for. A rigid horizontal cross-bar holds the two electric lights rigidly. The end of the crankshaft is finished in German silver and the starting crank, which is not ordinarily needed with the Delco starting system, is carried in the tool box.

The cone clutch embodies a slight change over this year's design. Up to this time a single large drum spring was employed, but has been superceded by a construction involving six springs in a circle instead of the single one. The clutch has a full ball-bearing release.

The Lighting System

The cars for 1912 were provided with a separate dynamo electric lighting system which in the new cars has been supplanted by the provisions for lighting comprised in the Delco unit. Instead of the cowl being open, as in former models, a panel board has been run across the front of the car below the cowl, and carries the speedometer, fuel pressure gauge, sight oil feed, and the ignition and lighting switches. The effect is to give an appearance of accessibility and compactness not attained in designs of previous years.

The acetylene starter and the magneto of course have yielded to the Delco electric unit. In adapting the Delco system to the Northway motor it was only necessary to cut a vent into the housing surrounding the flywheel so that the Delco



SIX-CYLINDER COLE TOURING MODEL

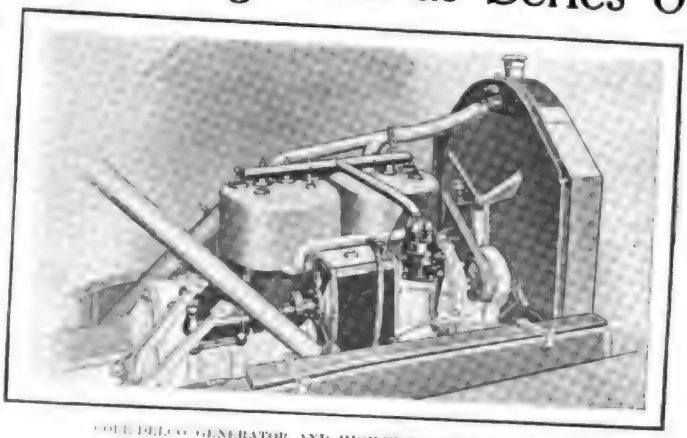
New Line to be Designated as Series 8

Delco System Electric Lighting, Starting and Ignition Fitted as Feature

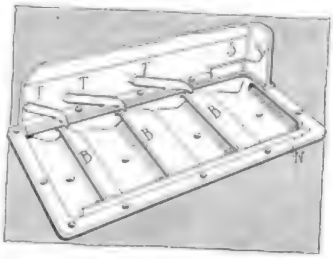
starting gears could mesh with the motor flywheel. The change has been made neatly. In the 1912 models the front fender was brought back to the running boards at a rather gradual angle, but in the new cars the fenders are brought down over the wheel more abruptly, meeting the horizontal of the running boards some 15 inches further to the front. The result is to give the running board more rangy effect. The extra tire has been moved to the rear.

Similarity in Motors

Except for the difference in the number of cylinders the 60 and 40 motors are exactly alike, while the 50 motor is the same as the 40 except for the difference in cylinder sizes. The cylinders are cast in pairs in all three models. There are three bearings in the crankshafts of the 40 and 50 motors and four bearings in the 60 motor. The main bearings in the 40 motor are 1⅞ inches by 3⅛ inches for the front bearing, 2 inches by 2¾ inches for the center bearing and 2¼ inches by 4 inches in the rear bearing, the first dimension in each case referring to the diameter and the other to the length of the bearing. In the 60 motor the crankshaft bearings from front to rear are 1⅞ inches by 3½ inches, 2⅛ inches by 2½ inches, 2⅛ inches by 2½ inches, and 2¼ inches by 3⅞ inches. The pistons on the 40 and 60 motors are 5¼ inches long and have 3 rings all above the piston. The piston on the 50 motor is 6 1/16 inches long and has three rings all above the wrist pin. The clearance between piston and cylinders is .003 inch. Adjustable push rods are employed the same as last year. These are hardened and ground steel and operate in cast iron dies. The valve lift on all three motors is 1½ inch and the clear opening is 1 13/32 inches on the 40 and 60 and 2 3/32 inches on the 50. The timing gears are fully inclosed, as are the valve-operating mechanisms. Lubrication of the motor is accomplished by means of a constant level splash system applied mainly by a gear-driven pump with a sight feed on the dash. The lubricating system may be considered in three divisions, first, the oil reservoir and supply tank; second, the constant level splash system; and third, the automatic circulation of oil in the splash basin. The oil reservoir is cast integral with the crankcase and located on the valve side of the motor just to the rear of the timing gear.



COLE DELCO GENERATOR AND HIGH TENSION DISTRIBUTOR

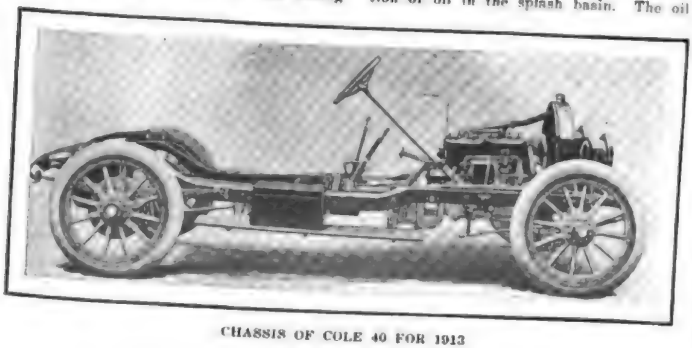


SPLASH PAN WITH BAFFLES

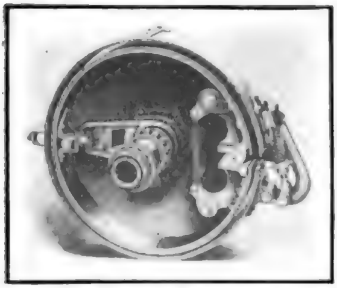
A large filler opening indicated at F in the sketch of the oil pump is placed on the cover plate of the reservoir and closed by a knurled cap screwed in place. At the other end of the cover plate is attached the pump. This extends downward into the reservoir, the only protruding working portion being the adjusting nut N. S indicates the oil strainer through which the fresh supply of oil passes. The oil pump comprises a cylinder feed C and a piston P normally held downward by the spring S1. A washer W between piston and spring bears on an eccentric cam on the shaft. The oil that is drawn through the bottom of the pump is delivered through the outlet O to a sight feed on the dash, from whence it flows to the crankcase. B1 and B2 are two ball valves, one in the pump proper and the other in the outlet. The shaft carrying the eccentric is operated from a camshaft by means of a worm gear at a reduction of 25 to 1.

Splash Pan Used on Cole

At the bottom of the crankcase is a splash pan shown in one of the sketches. The dippers on the ends of the connecting rod dip into the troughs and not only serve to carry oil to the crankpins but also splash it up into the cylinders and into pockets above the main bearings from which they are oiled. The oil pump supplies fresh oil to the splash basin circulating system. The circulation of the oil in the crankcase is accomplished by the baffle plate between the basins. They are sloped so that oil which is splashed upon them will flow from the back cylinder to the forward one. In addition to this there are a number of troughs T on the side of the crankcase wall so that oil



CHASSIS OF COLE 40 FOR 1913



BRAKE ASSEMBLY ON COLE

splashed out of one of the dip chambers is carried by the trough into the next forward chamber. At the front end of the crankcase is a splash basin S which communicates by means of an opening and duct with the rear splash basin, so that the oil is returned from the forward to the rear end of the crankcase. The cooling of the motor is maintained by means of a gear-driven circulating pump and a Mayo honeycomb radiator assisted by an adjustable belt-driven fan at the forward end of the motor.

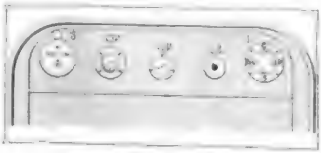
Pressure Fuel System

As stated above, fuel supply is maintained under pressure in the 1913 cars. A 20-gallon gasoline tank is hung under the rear cross member of the frame, and the liquid in it is kept at a pressure of about 2 pounds by means of a small air pump on the crank base. This is a plunger pump operated from the exhaust valve cam, the plunger being at right angles to the exhaust valve push rod. It is oiled by splash from the crankcase and is adjustable for pressure by a spring bypass controlled by a thumb nut and lock nut. The pressure in the fuel tank is registered on a gauge in the driver's compartment and a gasoline gauge is located on the tank at the rear. A hand pump is supplied as an auxiliary. In connection with this system is the new model O Schebler carbureter with double jet. A small control lever on the steering post cuts out the operation of both main air passages and locks the air valve to give a rich mixture and assist in starting. The claim of the makers of the Cole car for flexibility with the new motor and new fuel system is backed up by a recent test in which it is stated the car was run at a speed of 1½ miles per hour on the high gear with five passengers.

The Delco electric starting, lighting and ignition system as applied to the Cole cars embodies a combined motor generator and ignition distributor. This unit acts as a generator to store electric energy in the storage battery, which in turn supplies current for the ignition spark and the electric light and returns current to the motor generator unit to run the latter as a motor for starting the engine. The starting system comprises the following units: The motor-generator, starter transmission, magnetic clutch, controller switch, storage battery, ampere-hour meter, and cutout relay; the last four parts are combined in one unit on the runningboard. In addition there is the high tension distributor incorporated with the motor generator and the coil, etc., of the ignition system.

Delco Electric System

The motor-generator is located on the right side of the unit power plant and is driven by a roller clutch connected to the pump shaft through a leather faced clutch. This clutch allows the armature to revolve at a speed twenty times that of the engine when running as a motor for cranking. When used as a generator, it is driven through the roller clutch directly from the timing gear. The generator is self regulated and requires no exterior apparatus to regulate its current. It starts



COLE DASH ARRANGEMENT

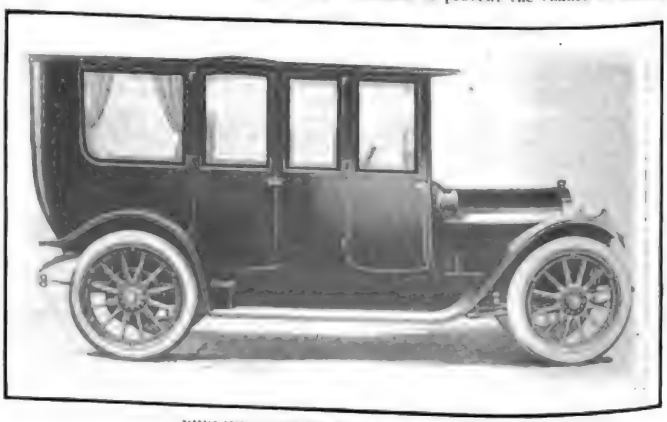
to charge the storage battery at about 300 revolutions per minute and the current gradually increases with the speed of the engine up to about 1,000 revolutions per minute, above which speed the output remains practically constant. For starting, the motor-generator is thrown into connection through gears with teeth cut on the periphery of the flywheel, the starting transmission bolting directly on to the flywheel case. Adjacent to the clutch pedal under the toe board is the magnetic clutch. This consists of the electro magnet with a latch and pawl. The clutch is actuated by pressing the starting button under the edge of the front seat. This completes the circuit which energizes the magnet, causing the latch to engage with the pawl on the clutch pedal and throws the starting transmission into operation.

The ignition system comprises a high-tension distributor and timer with automatic spark advance, a non-vibrating coil, resistance unit, controlling relay and ignition switch. Current is taken at 6 volts from the battery in the ordinary way. The ignition system is simply the improved Delco system. The battery box contains a twelve-cell, 80-ampere-hour Exide storage battery, the controller switch, the ampere-hour meter and the cutout relay. The controller switch is an eight pole, double-throw switch. In running position, it connects four three-cell sections of the battery in multiple, giving 6 volts, and also makes connections for lighting, ignition and charging. In starting position it connects all the cells in series, supplying current to run the motor generator as a motor at 24 volts. The function of the cutout relay is to open the circuit between the battery and generator to prevent the former from discharging into the latter when its speed is less than 300 revolutions per minute. It also automatically closes the circuit above that speed.

Cole Clutch Changed

Cole clutches, though of the cone type, as in previous models, have been changed by the substitution of six retaining springs in a circle instead of the single central spring. The three-speed selective gearset shows a change in the method of mounting the driving gears, in that two annular ball bearings are used instead of the one employed formerly.

Final drive is by shaft through two Spicer universal joints to the floating rear axle. The torsion rod is of the V type and is made of seamless steel tubing brazed into drop forged steel brackets with two vertical crossmembers. The internal brake levers are brazed into sleeves and the external levers pinned to shafts within them. The ends of the brake cross rods where they have a bearing in the frame are rounded to prevent the chance of binding



BERLINE LIMOUSINE ON COLE 40 CHASSIS

with twists of the frame. Instead of the toggle joint operation of the internal brakes used in the present models, the 1913 brakes are operated by a cam arrangement.

Frames on the three models are pressed steel channels, those of the two larger models being ⅛-inch gauge with 4½ inches maximum depth, and 3¼-inch flange. The frame of the smaller model is of ⅛-inch metal, but is otherwise the same. Springs are three-quarter elliptic in the rear and semi-elliptic in the front. They are of heavy construction with nine leaves. The lower portion is almost flat in the rear and a true flat with the load in the car.

Deep Cowl on Dash

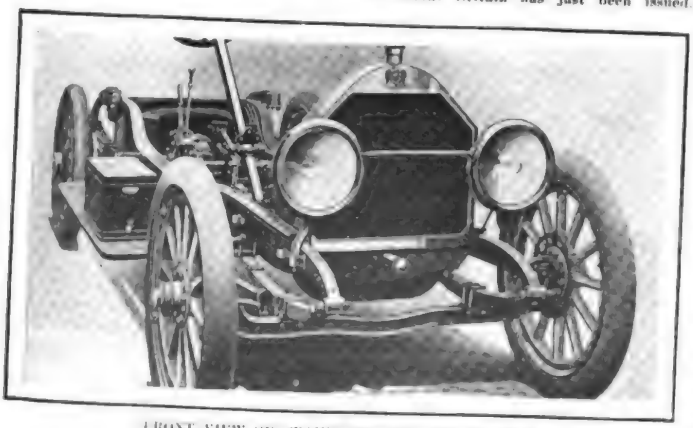
A general tendency toward straight lines is noticeable in all the bodies. The deep cowl, illustrated in one of the sketches, carries a panel which contains the oil sight feed OP, speedometer S, the air pressure gauge GP, lighting switch LS and the ignition switch I. The latter consists of four buttons giving connections to battery, generator, starting and off.

To the 40 chassis are fitted roadster and touring bodies; to the 50 and 60 chassis a five-passenger touring convertible to seven, roadster, toy tonneau, coupe and limousine bodies. The metal finish is black and aluminum and the lamps are finished in german silver.

Perhaps the most noticeable improvement has been in the outward appearance. The body lines have been greatly refined, all unsightly concave surfaces being eliminated, and the general effect being one of gentility, that comes of direct and frank lines and simplicity. It is also notable that the touring bodies set lower.

Throughout the line it is noticeable that every effort has been made to produce a car in keeping with the Cole reputation.

The Cole production has been doubled for the coming year. A new factory has just been occupied and President J. J. Cole has his architects working on plans for another structure similar to the one just completed.



FRONT VIEW OF CRANKLESS COLE SIX CHASSIS

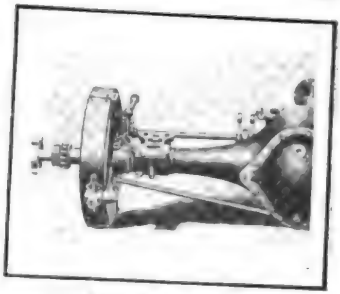
The Motorists' Bookman

Internal Combustion Engines

An elaborated translation of a work published originally in Sweden, "Internal Combustion Engines and Gas-Producers," by C. W. Askling and E. Roesler, of Bernosand and Stockholm, Sweden, has been published by the J. B. Lippincott Co., Philadelphia, Pa. This work is a general treatise on internal combustion motors of all types, and consists of two parts, the first dealing with gas producers, and the second with internal combustion engines. The first portion may be passed, as dealing with subjects foreign to motor car practice. The second part, however, should be of great interest to motor car engineers, dealing mainly with the greater development of direct heat engines as applied to stationary and marine work. This, while not strictly related to motor vehicle practice, is analogous to it in the problems of the conversion of latent chemical power into active energy. The development of these types of engines has been radically different from that in the field of motor car and flying machine practice. That both fields are mutually beholden to the activities of the exponents of the other, is recognized and set forth by the authors, and the exposition of the engineering practice and development of the two fields, side by side, should prove a work of great value to students of the problems of either.

R. A. C. Year Book

Containing such a mass and variety of information regarding the motor car in England as to constitute a veritable compendium of motor car information for those contemplating motoring abroad, the Year Book of the Royal Automobile Club of Great Britain has just been issued.



COLE FLOATING REAR AXLE

It is sent free of charge to members of the organization, a charge of 5 shillings being made for copies to others than members. The book contains in addition to the complete rules, regulations and by-laws of the club, and the motor vehicle laws of the United Kingdom, hints and information regarding nearly every feature of foreign touring and motor car operation. It is attractively bound in cloth in royal blue and gold, size, 5 by 7½ inches. It is published by the Royal Automobile Club, London.

English Motor Treatise

An elemental study of motor cars from an English view-point has been prepared by George C. Sherrin, A.M.A.I.E., and edited by Lord Montagu. The title of the book is "The Montagu Motor Book," and it is published by The Car, Illustrated, Ltd., of London. It completely describes all of the principal English cars, and in so simple and complete a manner that the merest novice cannot fail to comprehend them. It is absolutely non-technical, and every point is carefully illustrated. While no description is given of any American gasoline car—as a study for the beginner it is doubtful if anything better could be obtained. The book covers the subject of the anatomy of the car very thoroughly, including complete descriptions of the engine, carbureter, ignition, gearset, etc., and contains a description of the White steam car, and the Knight-Daimler engine. Tires are treated upon, and a chapter on electric cars is included. The book concludes with a driving lesson that is very complete, and a chapter on roadside repairs. It is bound in light gray cloth and there scarcely is a page but what has an illustration of some sort. To supplement the text, a series of five working models is offered by the publishers, which in conjunction with the book should prove a combination of much value.

Motor Road Maps

"Auto Road Maps for California and Nevada" is the title of a vest-pocket edition for the 1912 season, which the Monarch Oil Refining Co., has just published. While it advertises the Monarch-Diamond motor car oils and greases, the little book contains much valuable information in the way of routes in the two states with maps. Price, 50 cents.

From the

MANITOBA Licenses—The total number of Manitoba licenses issued this season since April 1 has reached the large number of 4,064.

State Meeting Called—The annual convention of the New York State Automobile Association will be held in December, undoubtedly in Utica, N. Y.

Wants Home Among Pines—A country club among the giant pines of Swarthout canyon, 7,000 feet above the city of Los Angeles, is the ambition of the Automobile Club of Southern California. Six miles of the roadway leading to the site of the new home already have been graded.

Club Sets an Example—The Watertown Motor Club of Watertown, Wis., organized 3 months ago with seventy-five members, has completed a sample stretch of road, the principal value of which is to illustrate the small cost of maintaining ordinary highways when proper methods are used. A stretch of 1 mile of dirt road between the western city limits and the village of Ixonia has been scraped, the stones removed and a split log drag applied after even the lightest shower and is today one of the finest pieces of highway in Wisconsin.

Clubmen Can Make Arrests—Special police powers have recently been granted a number of members of the Hoosier Motor Club, Indianapolis, for the purpose of aiding the police department in enforcing the speed law. One evening recently, W. S. Gilbreath, secretary of the club, ran down and arrested Baird Brill, who was running at the rate of 30 miles an hour. In police court Brill was fined $30 and costs. The regular schedule of fines for speed violators in the Indianapolis police court is $1 a mile, up to the maximum of $50 provided by the law.

Rockingham to Have Meet—The owners of Rockingham Park, Salem, N. H., have decided to hold another motor race and motor cycle meet at the park on Columbus day, October 12. Plans are under way to bank the track and stretch it out to a 2-mile course after the plan of the Indianapolis speedway for next season and then hold some big events there. At the last race meet, although it was postponed twice, there was an attendance of more than 17,000 people, and the greater portion came in motor cars, there being more than 3,000 checked at the track. James Fortesque has been chosen referee and Lon Peck starter of the race meet.

Touring Encourages Road Building—The fact that Amarillo is on the motor car tourist route between points in Texas south and east of Amarillo and Denver as well as on the route between Oklahoma and Kansas points and New Mexico and other points of the southwest has forced upon the people of that section of the panhandle the necessity of improving the highways, and with this object in view steps have been taken by the chamber of commerce of Amarillo and other civic bodies of this part of the state to not only improve the existing roads but to construct others that will be devoted exclusively to motor car travel. Signboards and distance markers will be placed upon all of the main highways.

MRS. JANE BARTELS' CAR IN SYRACUSE PARADE

Gives Police Control—A change in the Pennsylvania state law that will confer power on the Philadelphia police department to control the issuance of all motor car licenses in this city is being agitated as a remedy for making easier of detection and running to earth certain forms of crime in which the motor car plays a leading part.

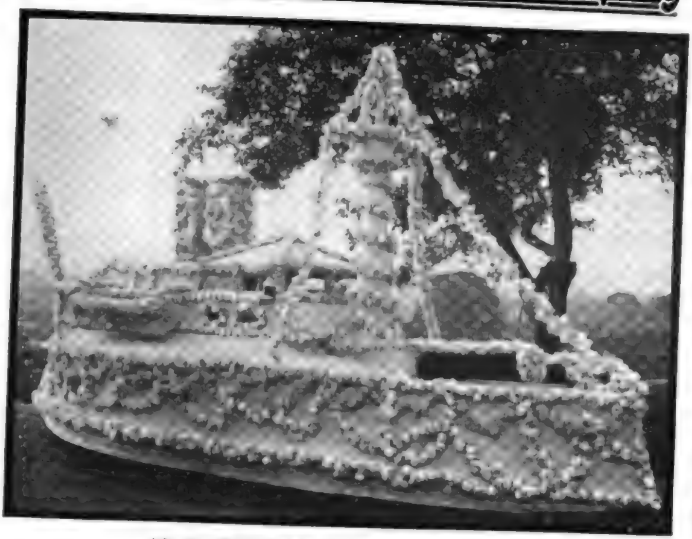
New Indiana Club—The Lawrenceburg Automobile Club has been organized at Lawrenceburg, Ind., with twenty-seven members, the officers being: President, John W. Oberting; vice-president, Robert E. Oberting; and secretary-treasurer, Edmund Bauer. An effort is being made to enlist every motor car owner in Dearborn county in the organization.

Illinois Fund Grows—Secretary of State Doyle of Illinois, in response to an inquiry states that the money in the state treasury accruing from the motor car licenses in Illinois is now $401,162. The law as amended and in force provides that said fees shall be set aside as a road fund to be appropriated by the general assembly for use on highways outside of incorporated cities, towns and villages. Most of the boards of supervisors in the various counties of the state are adopting resolutions concerning this fund and, in nearly every case, the rural legislators demand that the money be divided among the counties to be expended upon the roads. The Vermillion county board varied from the usual course and, at its session this week, favored a return of one-half to the counties, while the state be permitted to utilize the other half for the building of state roads.

Car a Road-Building Machine—D. M. Clark, road superintendent of Yavapai county, Ariz., is transforming his 40-horsepower Stearns into a road-building utility. The rear seat has been discarded and replaced with a big air compressor. This apparatus will be driven by power from the engine and attached thereto will be a big mine drill. When the remodeling is complete the drill will be used in boring on the Copper Basin road, which is to be widened and repaired. It is expected that it will be very valuable in rock work. Mr. Clark plans to patent his invention.

Syracuse Holds Parade—The best motor parade ever held in Syracuse, N. Y., was given Tuesday night, September 10, as a feature of the annual carnival of the Mystique Krewe of Ka-Noo-No, in connection with the New York state fair. More than 100 cars were in line and the decorations were the most pretentious since the feature was instituted several years ago. Many prizes were offered, the principal ones being as follows: For women drivers: Mrs. Jane Bartels, first; Mrs. Gus Weinbrecht, second; Mrs. Charles C. Hanna, third. Most unique design: Dev Brothers & Co., first; A. C. Fredenberg, second; Lee Stickley, third. Dealers: American Cole Motor Car Co., first; W. R. Shaw, second;

Four Winds



DR. GRACE CARROLL MOYER'S PRIZE WINNER

J. G. Bex, third. Commercial cars: P. R. Quinlan, first; Boedtker Tobacco Co., second. Mrs. Bartels' car represented a Dutch windmill with the fair driver attired as a Dutch maid.

Ohio Counts its Cars—According to the figures in the office of the state registrar Ohio has 60,500 licensed cars, and, notwithstanding the lateness of the season, applications are still coming in at the rate of sixty a day.

Mark River-to-River Road—September 15 was marking day from one end of Iowa to the other. All along the River-to-River road the local motor associations were out in force painting the poles along the route from Davenport to Council Bluffs. A white band 18 inches wide with a large red letter R will be the mark spread along the thoroughfare.

Roast for Milwaukee—Professor L. C. Smith, paving expert of the University of Wisconsin and member of the staff of the Wisconsin geological survey, has given his opinion that Milwaukee is the worst paved city in the United States. Motorists generally agree with Professor Smith, who says that the trouble is the result of the lack of uniformity in the use of materials.

Oklahoma Revising Laws—An organized effort will be made by the Oklahoma Good Roads Association to obtain the enactment of laws for the construction of a first-class system of highways by the next legislature. With this object in view it has appointed two committees which will direct the work of securing the legislation desired. The program contemplates a general revision of all laws affecting roads, including that enacted by the last legislature. The association has been in communication with the candidates of all parties for the legislature and out of the 100 districts eighty-six are favorable to new legislation along the lines suggested.

Beloit Aroused to Action—Following the example of the Fort Atkinson Automobile Association of Fort Atkinson, Wis., in conducting two booster tours for good roads and commercial advancement, the Beloit Automobile Club will on October 1 and 2 make a run to Milwaukee and return. Forty-one cars already have signed for the tour. Thousands of pieces of advertising literature will be carried and every industry in Beloit will be represented. Milwaukee has been made the night control, the run one way being approximately 75 miles.

Women Road Boosters—Valuable aid is being given the New Orleans-Chicago highway project by the women's clubs of Louisiana. Printed matter is being sent to all residents along the proposed route of this model road. Attention is called in the pamphlets to the fact that the United States is the only great country that has not built improved trunk lines of roadways. France has built a single road 750 miles long in Algeria and England constructed a government road 1,000 miles long, the length of the Malay peninsula, it is pointed out. If it is a paying investment to develop such outlying regions, it is argued, that a splendid roadway through the richest section of the United States certainly would prove of great profit. Appeal is also being made to the patriotism of the people, as the road is to be a memorial to General Andrew Jackson.

Many in Southern Run—One hundred and four cars were in line when the Nashville sociability tour reached Huntsville, Ala., last week. Nearly 600 persons from Nashville, Murfreesboro and Fayetteville were passengers. Huntsville entertained the guests with a banquet in Spring Park.

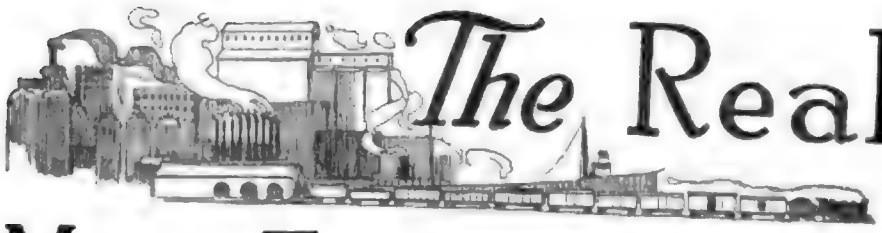
Decatur Progressive—Chief of Police Allen of Decatur, Ill., is enforcing the traffic ordinances in that city. Vehicles moving slowly are required to hug the curbing in order to permit faster moving cars or carriages to pass the wagons or other heavily loaded outfits. The police are also trying to control the muffler cutout.

Convicts Repairing Glidden Route—Permission has been given to put a large force of convicts on the Louisiana roads that will be traveled by the Glidden tourists. In the month which will elapse before the passage of the tour it will be possible to improve all of the worst portions of the road. In addition much work is being done on the route by the parish authorities.

Grossman Offers Race Bonuses—Pursuant to its regular practice, the Emil Grossman Co. offers again this year cash prizes to the winners of the important road races. It will award a prize of $500 to the winner of the grand prix; $500 to the winner of the Vanderbilt cup; $100 to the winner of the Pabst Blub Ribbon trophy, and $100 to the winner of the Wisconsin Motor challenge trophy, provided Read Head spark plugs are used by the winners throughout the respective races.

Must Turn over Fines—According to opinion rendered by State Attorney General Carmody of New York, justices of the peace throughout the state must turn over to the state treasurer the full amount of fines collected for criminal violations of the law in relation to the use of public highways by motor vehicles. The question was raised by State Treasurer Kennedy, who received the residue of a fine after deduction had been made for statutory fees by Justice Isaac Allen, of Southport, Chemung county. These fees, says the attorney general, are properly a town charge and should not be charged to the state.

Odd Arrest in Canada—For running a motor car by displaying the letters E-M-F instead of the regulation license number plate, as required by the provincial law in Canada, C. M. Burklew, a chauffeur employed by the E-M-F Automobile Co., of Walkerville, Ont., was arrested. At the hearing of the case Attorney J. F. Gross, who appeared for the defendant, claimed that the manufacturers had authority to run the car by displaying the letter of their firm instead of the license plate. The hearing was adjourned to give the defense time to submit the case to the provincial authorities.



The Realm of the Motor Truck an Advertising Medium

Great Publicity Is Gained Through Use of Modern Power Delivery

By William B. Stout

THE best advertised business must put up the best front. A claim for superiority of service must look the part and if extra advertisement is obtained for any firm through the use of motor trucks the quality of the advertisement will be dependent largely upon the appearance of the truck rather than upon its service.

At a stag dinner recently one of the guests appeared in a soft collar, the temperature at the time being 85 in the shade. A remark was made by another party in regard to the amount of good sense displayed by the man in question and comment was passed as to the neat appearance.

"A soft collar on a gentleman," said one of the observers, "is a great thing and extremely neat if he have with it a clean shave, a clean shirt, a new haircut, a well pressed suit and freshly polished shoes. Otherwise—not"

Anything which draws attention to either a man or his business to obtain the correct effect requires all the attributes of good taste.

If a motor wagon is put into service for delivery work, even at the present time it is unusal enough to call the attention of the public to the firm whose name appears on the side of the vehicle and the standing and methods of the firm will be judged by the motor vehicle much more severely than would be the case with the horse equipment. We expect a coal wagon to be dirty, and but little effort is made to keep these vehicles washed. The minute a firm adopts a motor truck for delivery work there is a different attitude on the part of the purchaser of the coal and of the man on the street who sees the machine go by toward an accumulation of dirt.

Coal dust will not injure an ordinary wagon but any man knows that any kind of grit is harmful to any kind of mechanism and to see even a coal wagon of the motor type covered with dust and grease with rusty bolts on exposed parts is to give the impression of slovenly business methods to even a casual observer.

One Chicago coal company in March of this year had running a motor truck which had been in use only 2 months which looked as though it had never had a wash nor any care in that time. Being a coal truck it had very evidently been treated like a coal wagon. The tires were in very bad shape due to the fact that a 4-ton load was being carried regularly on a 3-ton machine. The chains were loose and the sprockets were worn. Dust in places was ¾ inch deep on the chassis. The dumping apparatus had lost a small bolt and was out of commission for want of a 50-cent repair. The writer knows nothing of this coal company nor anything with regard to it sinternal management, but the looks of the vehicle in question certainly gave him a bad impression.

On the other hand a number of times recently motor trucks of another Chicago coal firm, the City Fuel Co., have passed the writer looking as though they had just come from a garage and a fresh washing, no sign of dirt being evident on the machine in any particular, the appearance giving the impression of thoughtful management in connection with the coal business. Not through any knowledge of the affairs of either company or with any preference one way or the other, the consumer, if it came to a choice, would undoubtedly order his coal delivered in a clean machine. If the deliveries were made by horse equipment the difference would not be so marked if noticed at all.

Another case in point is the truck operating for a line of drug stores on the north side, Chicago. The car is small, it is true, but having been used but one season has the appearance of a rattle-trap. For a fair percentage of each day it stands with its poor coat of dust-covered paint in front of one of the finest drug stores in Chicago, advertising to passersby who do not care to take the time to glance into the door an impression which is not so. The wonder is that the firm so thorough in the matter of internal fittings and design of the store itself—or stores, for there are four in the series—should be so entirely delinquent in keeping up the appearance of the delivery vehicle. It would seem almost like a man in a dress suit with a frayed red necktie; the suit may be all right but one sees the necktie first.

Chicago itself is not to be complimented on the general condition of the motor trucks operating for the city library in the matter of external appearance but this is not the fault of the management in charge, there being no money available sufficient to care for the cars other than their running gear and machinery. This fact, however, does not take away from the questionable advertising value of a coat of mud.

On the opposite side is an example of the Hoeffner Dry Cleaning Co. of Chicago, operating a small Ford delivery wagon. When not operating, this machine stands in front of the establishment as clean as washing can make it, neat in design and lettering, a very striking advertisement giving the impression of progressive methods and cleanliness all through the shop. Hardly a day goes by but what Mr. Hoeffner receives inquiries and business as a direct result of the condition and appearance of his car. A motor truck is truly an advertising answer.

A bread company has a motor truck operating in the central district of Chicago delivery work whose condition suggests anything but an appetizing product. The truck may have been painted at one time or another for the sign is still legible. Everything on the machine seems to be in the last stages of dilapidation. The front spring shackle, most noticeable on the car as it was seen at the curb, had been repaired by a very crude blacksmith, who did a most atrocious job of hammering in making the fitment which, after it once had been applied was allowed to rust without hindrance. The side chains on the machine were in very bad shape and the noise made by the machine in passing was irritating.

Though an electric truck is supposed to work silently this machine made as much noise as the crude gasoline trucks of the early days. The steering gear of the machine was very loose, the play amounting to a full half turn of the wheel. This point nearly led to an accident a short time later when the machine was entering the alley at the rear of the Hayward building through the inability of the driver to take up the lost motion quick enough. If the outside of the truck presents as uncleanly an appearance as did this the question immediately comes to one's mind as to whether the interior is kept clean enough for a product to enter one's mouth.

The Commercial Car

Wear and Tear on Solid Rubber Tires

Expert Gives Statistics of Benefit to Truck Manufacturers

By C. W. Martin, Sales Manager Goodyear Tire & Rubber Co.

A TOPIC of natural interest to all owners and operators of motor-driven commercial vehicles, is the discussion of methods to prevent the wear and tear of solid rubber truck tires. This part of the equipment is admittedly the most serious item in the cost of truck up-keep. There are many insignificant details in the operation and care of a motor truck that have an important bearing upon the life and service of its rubber tires.

Natural or ordinary wear under normal conditions, causing abrasion, is attributable principally to tractive effort, starting and stopping, or skidding. When these elements are not attended by others, which will be described later on, a solid rubber tire can be expected to give the maximum of service and to wear out legitimately.

Undue abrasion may be caused by wheels being out of alignment, resulting in a tire wearing down smoothly and prematurely, thus more than likely causing an impression with the truck owner that the tire is not all that it should be in the matter of quality and workmanship.

Disalignment sufficient to produce this effect in at least some degree may be so slight as to be unnoticeable in the absence of special attention. Wheels out of alignment very frequently are found, particularly front wheels. Usually these result from striking curb stones or any other obstructions glancing blows, thus causing bent axles, wrenched steering knuckles, or dished wheels. The wear is the same as would be obtained by holding the tread of the tire on a swiftly moving grindstone and revolving it slowly.

Turning the front wheels by means of the steering apparatus when the truck is not in motion also has its bad effect.

Disalignment may be detected by measuring the distance between rims of the two front or two rear wheels at the extreme fore and aft points, care being exercised to see that the front wheels, when measuring them, are pointing straight ahead or parallel with the body of the truck. The distance at fore and aft points will be found to be the same if the wheels are in perfect alignment.

Traveling over exceedingly rough pavement and sharp stones, such as are found on newly macadamized roads, produces cuts into which sand and grit work, slowly enlarging the gap and eventually causing the destruction of a solid rubber truck tire.

Continual running in car tracks invariably results in the destruction of a truck tire, as the edge of the tire, or the very small portion which runs on the rail is carrying the load intended for the whole tire. Also a shearing effect is thus produced which is very injurious to the tire's fastening. Cutting also may be caused by careless driving on streets in normal condition, or by careful driving combined with overloading, on bad streets. This condition may be due to the tire being allowed to stand in oil in the garage. Oil has a chemical action upon rubber which is extremely injurious.

In this day of increasing popularity of demountable tires and standard wheels as adopted by the Society of Automobile Engineers it is important that wheels be of proper dimensions and that all bolts be thoroughly tightened so as to prevent circumferential movement of the tire on the wheel. A tire will fail to stand up under overloading, which strains the fastening and crushes the tread, causing bruises and chafing. Speeding virtually has the same results as overloading, producing shocks when riding over obstacles of various kinds which bruise and cut the rubber.

The Goodyear Tire and Rubber Co., after a thorough and scientific analysis of all conditions and requirements by its experimental engineering department, has adopted and recommend the accompanying graduated table of carrying weights:

It will be noted that tires are rated according to their diameters as well as their cross-sectional size; and speed has been given proper consideration. A careful observation of the table will have its effect in reducing truck tire mile cost.

MANY ADOPT TRUCK GUARANTY

Fourteen truck manufacturing members of the National Association of Automobile Manufacturers out of thirty-three now making commercial vehicles have definitely adopted the new truck warranty recommended by the executive committee. Fourteen makers who are not members have also adopted it and will incorporate it in their new catalogs and contracts of sale. These companies are as follows:

Members of N. A. A. M.—Baker Motor Vehicle Co., Federal Motor Truck Co., Gramm Motor Truck Co., Kelly Motor Truck Co., Knox Automobile Co., Locomobile Co. of America, Packard Motor Car Co., Peerless Motor Car Co., Pope Mfg. Co., Reo Motor Car Co., Selden Motor Vehicle Co., United States Motor Co., Waverley Co., White Co.

Non-members—Auglaize Motor Car Co., Brown Commercial Car Co., Chase Motor Truck Co., Champion Wagon Co., Dorris Motor Car Co., Geneva Wagon Co., Gramm-Bernstein Co., Harwood-Barley Mfg. Co., Hatfield Auto Truck Co., Kearns Motor Car Co., Sanford Motor Truck Co., Stewart Motor Corp., U. S. Motor Truck Co., Veerac Motor Truck Co.

In addition to these twenty-eight companies, there are four members and nine non-members who approve the warrant just as it is written and will adopt it if a majority of truck makers do so. They are:

Members—Nordyke & Marmon Co., Ohio Electric Car Co., Walter Motor Truck Co., Willys-Overland Co.

Non-members—C. L. Barker, Bowling Green Motor Car Co., Chicago Pneumatic Tool Co., Dayton Auto Truck Co., Marathon Motor Works, Moreland Motor Truck Co., Poss Motor Co., Sandusky Auto Parts and Motor Truck Co., H. E. Wilcox Motor Car Co.

This makes forty-one companies committed to the warranty. Three other member companies that are not yet actively

GRADUATED TABLE OF CARRYING WEIGHTS FOR SOLID TRUCK TIRES

Size		lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	M.P.H.
2 "	Singles	450	475	500	525	550	575	20
2½ "	Singles	670	710	750	790	830	870	20
3 "	Singles	900	950	1000	1050	1100	1150	20
3½ "	Singles	1130	1190	1250	1310	1370	1430	18
4 "	Singles	1350	1425	1500	1575	1650	1725	16
5 "	Singles	1800	1900	2000	2100	2200	2300	14
6 "	Singles	2250	2375	2500	2625	2750	2875	12
7 "	Singles	2700	2850	3000	3150	3300	3450	10
2½ "	Dual	1125	1188	1250	1312	1375	1438	18
3 "	Dual	1675	1775	1875	1975	2075	2175	18
3½ "	Dual	2250	2375	2500	2625	2750	2875	16
4 "	Dual	2825	2975	3125	3275	3425	3575	14
5 "	Dual	3375	3560	3750	3940	4125	4310	13
6 "	Dual	4500	4750	5000	5250	5500	5750	12
7 "	Dual	5625	5940	6250	6565	6875	7180	10
	Dual	6750	7125	7500	7875	8250	8625	10

TILTING DRIVER'S SEAT ON LAUTH-JUERGENS TRUCK

engaged in the commercial field state that as soon as they enter it on a sufficient scale to have need for a guarantee they will use the standard warranty. These are the Buick Motor Co., Columbus Buggy Co., and Jackson Automobile Co.

Only five members heard from are opposed to use of the warranty. They are the Autocar Co., Ford Motor Co., Franklin Mfg. Co., General Motor Truck Co., and Pierce-Arrow Motor Car Co. Their objection is that they do not consider it sufficiently liberal, particularly as regards its duration. They prefer a guarantee for 1 year, or even, apparently, in one of two cases, one without limitation. The Buckeye Mfg. Co., Driggs-Seabury Ordnance Corporation, National Motor Truck Co., and Wichita Falls Motor Co., all non-members, are of similar opinion. In the case of the Buckeye and National companies, their literature is out already, incorporating a year's guarantee, and they do not feel that they can recall this warranty now and substitute the 90-day standard warranty.

On the other hand, there are a number of manufacturers who voluntarily took occasion particularly to commend the 90-day limit, holding that a guarantee for 1 year was entirely too long and that if a defect does not appear in 3 months of actual service it is prima facie evidence that proper materials and workmanship were used in the construction of the car for the purpose for which it was built. Among these companies are the Dayton Auto Truck Co., Marathon Motor Works, Poss Motor Co. and the Sandusky Auto Parts and Motor Truck Co. One company, which was forced temporarily to suspend manufacture of trucks because of the 1-year guarantee which necessitated keeping in running condition trucks that were placed in the hands of ignorant negroes and incompetent white men, believes it will be able to resume their manufacture with some profit if the 90-day warranty is generally adopted.

The only serious obstacle in the way of practically universal adoption of the new standard warranty is the uncertainty as to whether or not a majority of leading manufacturers will adopt it and, once adopted, it will be lived up to strictly in all cases. While it is realized that those who adopt the warranty will do so with the sincere intention to live up to the letter of it, there are conditions in the trade that will have a tendency to cause some companies to deviate from its terms, particularly the 90-day limit, and thereby work a hardship on those who abide by it for the good of the industry as a whole.

Both in and out of the association there is a strong sentiment in favor of co-operation on this subject and a belief that a great deal of good can be accomplished by adopting a uniform guarantee and living up to it. This implies not only that the manufacturer shall abide by it, but that all of his agents shall be restrained diligently from making verbal or any other sore of guarantees or promises not authorized by the manufacturer. It was the object of the association in recommending the new warranty to provide a means whereby, through cooperation, the unsatisfactory conditions due to irregular guarantees might be corrected. The final clause of the standard warrant expressly denies to the agent the right to make any other guarantee or extend or amplify the standard warranty.

FRENCH PROMOTING PLOW TEST

Entries have been received of eighteen motor plowing machines for the trials to be held at Bourges, in central France, on October 1, 2 and 3. America is represented by the French branches of the Case company and the International Harvester Co., each firm having one machine. The English competitors are two machines from the W. Foster Co. The use of a field 100 acres in extent having been secured, it will be possible for all the machines to operate at the same time. In addition to the plowing match there will be an exhibition and competition of fire-fighting appliances specially suited to agricultural requirements.

The general exhibition will comprise all types of machinery and motors applicable to agricultural purposes. A novel feature will be a motor fair based on the old-time horse fairs, in which new and second-hand motors, cars, tires and accessories will be brought in for sale and exchange among the visitors. The government is showing considerable interest in the movement, the minister of agriculture having promised to attend and distribute the prizes on the closing day.

RUSSIA HOLDING TESTS

Russia having decided to make extensive purchases of motor trucks for army transport services, is holding a series of practical tests on the same lines as the recent French army trials. The country having practically no motor resources has made an appeal to foreign nations, with a special request that French firms should compete. The result is that Panhard-Levassor, de Dion-Bouton, Saurer, La Buire, Renault, Delahaye, Latil, Bayard-Clement, Berliet and Schneider have each sent various types of 1½ and 3-ton trucks to compete in the trials from September 17 to 30. The start of the tour was from St. Petersburg last Tuesday, running to Novgorod, Krestzy, Moscow and Vladimir, and return by the same route to St. Petersburg. It is understood that all vehicles coming through the trials in a satisfactory manner will be purchased outright by the Russian army.

FRENCH ARMY TRUCKS ACCEPTED

Out of the sixty-six motor trucks having competed in the recent French army trials, forty have been declared to have satisfied all requirements and the models which they represent will be accepted as approved subsidized types in conformity with the usual regulations. The successful firms with the number of approved trucks are: Schneider, two; Panhard-Levassor, four; La Buire, two; Aries, two; Delaugere-Clayette, two; Clement-Bayard, two; Front-drive Latil, four; Saurer, six; de Dion Bouton, two; Berliet, eight; Motobloc, two, and Renault, four.

COMPETE WITH TROLLEY FREIGHT

According to Superintendent N. H. Brown of the Worcester and Southbridge, Mass., electric car line, freighting by motor trucks has reached a point where it is not only practical but can be done low enough to compete with steam railroads and trolley lines. He says:

"While it will be some time before

motor trucks will be able to haul as cheaply as the trolly express on its through lines, yet we find that the trucks already offer some competition from the fact that they are able to call for the goods at the wholesalers and then deliver it at the door of the retailer or consumer. This saves the cartage at both ends which we are unable to do. Already we find that considerable express business is done through the western part of our run by the motor trucks from Springfield, and in some cases the business in these has progressed to such an extent that a regular schedule is maintained. While the trolley express will have its own field for a long time to come, yet the progress that has been made in motor building and the effect it has on transportation shows that no person can conduct business today without constantly changing front to keep pace with the times."

STUDEBAKER USED BY CHICAGO SAW SHARPENER

MOTOR ROLLERS USED IN ENGLAND

On many of the race courses, polo grounds, golf links, cricket grounds, etc., of England, the rolling of the grass or lawns is today performed by motor appliances. Newmarket Heath, Lord's cricket ground, the Stoke Poges golf course, the ground of the Kingsclere racing stables, for instance, all rely upon motor rollers. Governments, corporations and county councils are using them for road making. Dukes and earls and large owners of other classes are using them for estate work. And all these machines have been produced by one firm, Barford & Perkins, Peterborough, an old firm of specialists in this class of work.

The weights vary from 3 to 11 tons. The machine is a combination of water ballast roller with a motor of the class used in heavy motor vehicles. The rear roller is made of hard-cast metal of ample strength, and the smallest size holds about ½ ton of water. The outside edges of this and of the front rollers are well rounded off. The channel iron frame is stiffly braced together, the forepart being coupled to the front rollers by a patent spring steering head and bridge. Springs also are used over the rear axle to minimize vibration and strain on the frame. The shafts are all of best quality mild steel.

The motor is of heavy design, running at a moderate speed. A sufficient body of water is carried in the circulating tank to enable the cooling to be efficiently done without the aid of a fan or pump. The tank or gilled radiator is placed over the rear roller, so that its weight is in a useful position, while at the same time its height renders a pump unnecessary, the circulation being automatic. A leather-faced cone clutch transmits the power to the gearbox, and two speeds, either forward or backward, are arranged for, usually 1 mile and 3 miles an hour, the change being conveniently made from the driver's seat. The final transmission is by chain to a large sprocket on the hind roller. The steering is easy, the hand wheel being connected by means of a chain to the steering head before mentioned, and the bridge spanning the front rollers allowing a considerable oscillation of the rollers, when passing over stones or other obstructions, without affecting the level of the main frame.

MOTOR ROLLER USED IN ENGLAND

SARATOGA FIGURES COST

Fire Chief E. J. Shadwick of the Saratoga, N. Y., department states that during the past year his new motor fire truck cost the city $28.76 for maintenance, while the horse-drawn vehicle in the same house cost $1,570.22. In the latter instance the apparatus itself was an expense of $590.22, but the services of an additional man cost $780 for the year. Then the old horses had to be substituted by a new pair which cost $200.

ALCO TRUCK REACHES RENO

On the last leg of its journey from Philadelphia to the Pacific coast the Alco truck that is making the first coast to coast delivery of merchandise on record arrived at Reno, Nev., with the mileage figures boosted to 3,753. In reaching Fallon, Nev., the crew found it necessary to blast rocks because of the narrow roads, wide enough in places only for touring cars. At Eureka the truck left the road close to the railroad track and made its way for 70 miles across country through narrow winding mountain passes to Austin. For the greater part of the day the crew drove into the teeth of a blinding snowstorm that obliterated the road and in some places turned the going into slippery mire. Twenty per cent grades were common.

Before the truck delivers its consignment the plans call for presenting a letter of greetings at the capitol in Sacramento from Governor Tener of Pennsylvania to Governor Johnson of California.

WHAT becomes of the waste metal accumulated daily in the machine shops of the big motor car factories of the land? Where does it go to? Is it a total loss to the firm? How much of it is there? Questions like these were asked by a visitor at the Ford plant in Detroit as he was being shown through the maze of machines. The visitor noticed the scrap boxes near some machines and the pans under others that were filling, being emptied, and refilling with tiny bits of steel, brass or cast iron as the case might be.

The sight of so much seeming waste aroused the investigative propensities of the visitor and he piled his guide with questions. The guide's explanation was something like this: He told the visitor that what seemed to be waste really isn't waste at all. It is worked over again and made into good material.

After telling how the waste from each machine is collected at one end of the factory, he pointed to a man at work apparently playing in a big pile of steel and brass machinings. But the guest soon discovered the man wasn't wasting his time. In his hand he had a large magnet which he kept dragging through the machinings. It was explained to the guest that this is the method of separating the steel from the brass, the steel being caught and held by the magnet, but the brass not noticing in the least the influence of the magnet pull. If there is the least bit of brass in the steel machinings it renders the latter almost useless for salable purposes.

Then the guest was taken to where the steel borings were pressed and baled as if in a paper baler. Next he watched the huge crane lift the bales of borings and the boxes of other machinings onto freight cars on which they are hauled away. The guide told the visitor that this factory sends out about ten carloads of steel turnings, and three carloads of cast iron borings each month. The amount of brass waste totals about 1 ton per day in the Ford factory alone. The steel turnings are sold to the big steel mills at Pittsburgh. At the mills the turnings are melted in the cupolas and again molded into steel bars. The same thing happens to the brass waste. It is sold back to the firm from which it came and is re-smelted into brass ingots. Most of the big factories melt over their own cast-iron waste. This waste—which is not waste at all—totals into the millions each year, for the Detroit factories alone.

SEIBERLING Quits Apperson—The resignation of Al G. Seiberling as secretary and treasurer of the Apperson Brothers' Automobile Co., of Kokomo, Ind., has been announced.

Kurtschora Makes Investment—Martin W. Kurtschora, for many years manager of the Beaver Mfg. Co., motors, Milwaukee, Wis., has purchased the controlling interest in the Northwestern Storage Battery Co., of Milwaukee, manufacturing accumulators, electric lighting systems, lamps, etc. Mr. Kurtschora will assume the active management. Officers of the re-organized company are: President, Martin W. Kurtschora, vice-president, E. D. McLaughlin; secretary, F. F. Scudder; treasurer, William Jacobs. The new management is outlining a policy of immediate expansion.

Among the Makers

STUTZ 1912 ROADSTER EQUIPPED WITH WOLF WIRE WHEELS

Pawlett Resigns—Louis M. Pawlett has resigned as executive engineer for the Locomobile Co. of America and will become a consulting engineer with offices at 1786 Broadway, New York city.

New Gramm Plant Starts—Friday, the 13th, has no terrors for the new Gramm-Berstein Co. management at Lima, Ohio, as the first wheel in the new plant was turned on that morning, and the manufacture and assembling of motor trucks in the new factory was begun. B. A. Gramm stated that 250 motor trucks will be turned out by the plant within the next 6 months.

Putting Up New Machine Shop—The Pierce Motor Co., of Racine, Wis., the motor car division of the J. I. Case Threshing Machine Co., and manufacturing Case cars, is building a new machine shop and assembling building, four stories high, 130 by 80 feet in size. The new building is situated between the present motor car works and the $1,000,000 foundry plant now under construction for the Case company at Lakeside, Racine.

Canadians Invading U. S.—So great has been the growth of the tire market in the dominion that it now is stated on good authority that the Canadian Rubber Co. contemplates erecting a large factory in the United States for the exclusive manufacture of tires. The factory of the Canadian Rubber Co. in Montreal has been found insufficient to supply the demand, and for a short time has not been turning out tires in such large quantities as formerly. However, with the erection of a fine new plant on the American side, the Canadian Rubber Co. intend to make a special line of tires and market them in the United States.

Berth for Fitzsimmons—C. P. Hatter, assistant sales manager of the Velie Motor Vehicle Co., has resigned and is succeeded by George Fitzsimmons, formerly with the Thomas factory at Detroit.

New Industry in St. Joe—Articles of incorporation have been filed by the Wizard Mfg. Co., of St. Joseph, Mich., which is organized for the purpose of manufacturing and selling carbureters and other motor vehicle accessories. Frank A. Sharpneck and Thomas Robinson, of Chicago, and Gerald C. McDowell, of St. Joseph, are the incorporators.

Boston Booming Shows—Plans are now being whipped into shape for the annual motor shows in Boston. There already are enough applications for space to fill the hall. The show this season begins a week later than in the past, starting March 8. Many applications have been made for membership in the organization, but these will not be considered until after the show is over. The Commercial Vehicle Dealers' Association held a meeting to consider show matters, too, for many of them are members of the pleasure car association, and they act jointly on such matters. The resignation of Christopher F. Whitney as president was accepted, he having retired from the motor business. The directors chose Josiah S. Hathaway, manager of the Boston branch of the White Co., and the vice-president of the other association, to fill the vacancy. The applications for space at the show next March are more numerous than last year and in number and total of vehicles the exhibition will be

and Dealers

much larger. The electric show which starts early in October in Boston is to have a special section devoted exclusively for electric motor vehicles, both pleasure and commercial.

Another Velie Building—The Velie Motor Vehicle Co., of Moline, Ill., is to erect a $15,000 road repair and test building south of the present factory shop. The new building will be 80 by 200 feet in dimensions and will be modern in construction throughout.

Stoddard-Dayton Outing—One hundred of the officials, department heads and clerks of the Dayton Motor Car Co., of Dayton, Ohio, enjoyed an outing at Olt's park last Saturday. Dinner was served at 1 o'clock, after which an athletic program was inaugurated. Cricket matches, baseball games, running races and a tug of war were included in the program.

California's Big Business—California took delivery on 34,110 cars during the fiscal year, which closed August 31. These figures are issued by the secretary of state as the number of motor cars registered during the 12 months period, and places California near the top of the list. That the motor car industry is growing by leaps and bounds is attested by the fact that during the 1910-11 season but 15,905 cars were registered at Sacremento, giving the season just closed an increase of 8,205 cars. This is greatly in excess of 50 per cent of the former total and represents the actual gain in a single year. The Studebaker had 5,653 registered. Next in point of popularity came the Ford, with 3,453.

Swinehart Factory for St. Louis—It is announced in St. Louis by J. A. Swinehart, of Akron, Ohio, that a factory and distributing station for Swinehart tires would be established in that city. The capital of $500,000 for the new enterprise was raised among St. Louisans, except that supplied by Swinehart. Arrangements have been completed for a building in the central part of the city near motor row. Philo said that the causes that led to the establishment of the factory at St. Louis were the cheap electric power to come from Keokuk dam, the attractive labor conditions, the low cost of coal, the excellent water supply and the advantages for a distributing point. He said the value of the annual output of the new factory would be $1,000,000. He declared that the raw materials could be brought to St. Louis as cheaply as they could to Akron and that when the Panama canal was opened St. Louis would enjoy an advantage over any eastern location. Rubber mostly comes from South America and Africa, and with the opening of the canal could be laid down in St. Louis on attractive terms. The new company will feature two products besides making the full line of solid and pneumatic tires and inner tubes. The Krots tire, a solid tire for light delivery wagons and electric broughams, will be one of the tires featured.

Porter Selects Assistants—Sales Manager J. D. Porter of the Garford company has removed his headquarters from Toledo to Elyria, where he is organizing his staff to take care of the much larger production for the ensuing year. H. G. Fitch, who has been assistant general manager of the Overland plant at Indianapolis, has been transferred to Elyria as general manager of the Garford company.

Not Going to Rochester—The report recently published that John H. Valentine, who recently withdrew from the Chalmers agency in Syracuse, N. Y., would remove to Rochester, where he was said to have become identified with a motor truck business, proves to be untrue. Mr. Valentine's business plans involve a continued residence in Syracuse and will be announced shortly.

Value of Ford Output—The Ford Motor Co. announces that the business for 1912 reached a total of $50,000,000, which was but $9,000,000 less than the value of the entire car output of Detroit in 1909. During the 11 months from October 1, 1911, to September 1, 1912, this company loaded and sent out 12,063 freight cars. The company built 75,000 cars during these months.

Drawbacks Allowed—Under a ruling of the treasury department at Washington, a drawback of duties will be allowed under section 25 of the tariff act of 1909 on gears imported in the rough and finished by grinding and polishing by the Gear Grinding Machine Co., of Detroit. The treasury department at Washington has authorized the allowance of drawback under section 25 of the tariff act on motor car castings manufactured by the Sherwood Brass Works, of Detroit, and exported as such or as parts of motor cars, such castings being manufactured from imported aluminum.

Prospects in Twin Cities—With Twin City bank clearings breaking all records and grain being received at the Minneapolis terminals ahead of record, motor car dealers are expecting to share in the general northwestern crop prosperity. President Howard Elliott returned from an inspection west to the coast over the Northern Pacific Railroad, says that business and crop conditions are excellent, and that the outlook is better than in years.

Franklin Sales Report—The record of Franklin dealers during the past selling year, which closed on August 31, shows a steady increase according to a report from the office of the Franklin Automobile Co. For January, 1912, sales were 86 per cent over sales for the corresponding month last year; for February 100 per cent, etc. July and August, the "dull summer months," showed an increase of 435 per cent and 330 per cent, respectively.

Overland Adding to Plant—The list of contemplated additions to the Willys-Overland factory in Toledo was increased last week when work was started on a two-story factory building to be used as an addition to the present plant. The addition will be 40 by 60 by 39 feet, and will cost $8,000. The additions now planned for this mammoth concern will cost several hundred thousand dollars and work is being pushed as rapidly as possible so that the buildings may be completed before the arrival of winter. Four of the largest buildings are being made considerably larger. Additions are being made to the final assemblying room, the main factory building, the forging plant, and the shipping rooms and the railroad docks. Railroad docks of this plant will be more than doubled in size and will be uniquely commodious and modern when completed. At present but three cars can be loaded in a day.

TRANSCONTINENTAL TRUCK ENCOUNTERS CAVE-IN ON ROAD NEAR WELLS, NEV.

Current Motor Car Patents

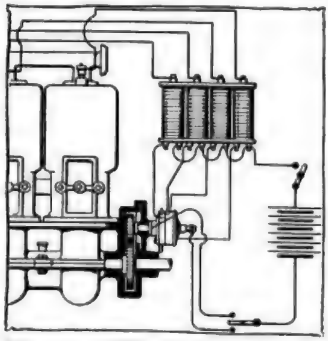


FIG. 1 — SMITH MECHANICAL-BREAK TIMER AND DISTRIBUTOR

PATENTS ISSUED SEPTEMBER 10, 1912

1,037,847—Vehicle Wheel. William Arnold, New York, N. Y. Filed March 3, 1910. Serial No. 547,036.

1,037,868 — Internal Combustion Engine. Robert W. Coffee, Richmond, Va., assignor to Lewis M. Keizer, Baltimore, Md. Filed July 13, 1907. Serial No. 383,667.

1,037,869—Transmission Mechanism. John G. Coleridge, Detroit, Mich., assignor to Coleridge Commercial Car Co., Detroit, Mich., a corporation of Michigan. Filed March 30, 1911 Serial No. 617,898.

1,037,874—Lifting Jack. Charles L. Crabb, Peapack, N. J., assignor to Topping Brothers, New York, N. Y., a corporation of New York Filed June 6, 1910. Serial No. 565,172. Renewed February 2, 1912. Serial No. 675,048.

1,037,875—Road Cutter and the Like. Lee D. Craig, San Francisco, Cal., assignor to National Trenching Machine Co., Washington, D. C., a corporation of Delaware. Filed December 14, 1909. Serial No. 533,063. Renewed February 3, 1912. Serial No. 675,340.

1,037,909—Attachment for Vehicles. Charles H. Herman, Medford, Ore. Filed March 20, 1912. Serial No. 685,043.

1,037,924—Motor Car Jack. Charles Edmund Kells, Jr., New Orleans, La. Filed October 23, 1911. Serial No. 656,102.

1,037,937—Regulating Device for Motor Cars. Christian Lebbers, Oberstenfeld, Germany. Filed January 19, 1912. Serial No. 672,459.

1,037,949—Resilient Wheel. Marius Mathiesen, San Antonio, Tex. Filed October 4, 1911. Serial No. 652,865.

1,037,954—Tire Puncture Finder. Francis Miller, Bellevue, Ky. Filed January 23, 1912. Serial No. 672,979.

1,037,955—Tire Puncture Finder. Francis Miller, Bellevue, Ky. Filed April 1, 1912. Serial No. 687,640.

1,037,961—Reversible Motor Car Lamp. George F. Minbinnett, Blooming Grove, Tex. Filed March 21, 1911. Serial No. 615,935.

1,037,984—Guide Map. Robert Reid, Victoria, B. C., Canada. Filed January 10, 1912. Serial No. 670,480.

1,037,993—Carbureter. George W. Romans, Los Angeles, Cal. Filed January 19, 1911. Serial No. 603,459.

1,038,016—Magnetic Speedometer. John K. Stewart, Chicago, Ill. Filed July 5, 1911. Serial No. 636,896.

1,038,033—Clutch. Adolph Fred Walther, Oakland, Cal. Filed December 4, 1911. Serial No. 663,890.

1,038,040—Carbureter. Arthur J. Weiss, West Orange, N. J., assignor by mesne assignments to Maxi Co., a corporation of New York Filed January 25, 1912. Serial No. 673,377.

1,038,047—Multiple Disk Gearing. Charles O. Wetherbee, Bath, Me., assignor to George Westinghouse, Pittsburgh, Pa. Filed December 27, 1909. Serial No. 535,194.

1,038,050—Carbureter. Donald R. Wills, Cincinnati, Ohio, assignor of one-half to Adolph Klein, Cincinnati, Ohio. Filed April 17, 1911 Serial No. 621,509.

1,038,054—Motor Car Vehicle. Lewis Wolf, McNabb, Ill. Filed April 1, 1912. Serial No 687,787.

1,038,092—Cooling Device for Pneumatic Tires. Andrew B. Craig, Tarkio, Mo. Filed January 31, 1912. Serial No. 674,489.

1,038,114—Traction Engine. Noah R. Getz, and Rohrer Getz, Manheim township, Lancaster County, Pa. Filed October 23, 1909. Serial No. 524,155.

1,038,132—Starter for Engines. John C. Henderson, San Francisco, Cal. Filed June 29, 1910. Serial No. 569,515.

1,038,143—Clincher Tire and Securing Lug Therefor. Miller Reese Hutchison, Summit, N. J. Filed November 20, 1908. Serial No. 463,695.

1,038,144—Rim and Tire for Vehicle Wheels. Miller Reese Hutchison, Summit, N. J. Filed July 28, 1909. Serial No. 510,134.

1,038,162—Low Hung Motor Truck. Solomon J. Levy, San Francisco, Cal. Filed April 6, 1911. Serial No. 619,275.

1,038,235—Tire. Marcellino Toso, San Bruno, Cal., assignor of forty one-hundredths to Paul H. Patterson, San Francisco, Cal. Filed August 29, 1911. Serial No. 646,569.

1,038,238—Cylinder and Piston Construction for Internal Combustion Engines. Walter M. Upchurch, Hurley, N. M. Filed October 23, 1911. Serial No. 656,137.

1,038,262—Carbureter. Mortimer Reynolds Anstice, Rochester, N. Y. Filed January 9, 1911. Serial No. 601,749.

1,038,286—Engine Starter. Edward M. Card, Bridgeport, Conn. Filed September 5, 1911. Serial No. 647,487.

1,038,300—Combined Vaporizer and Priming Pump. Francis G. Crone, Buffalo, N. Y. Filed March 24, 1911. Serial No. 616,612.

1,038,309—Motor Car Turn Table. Albert Delamore, Los Angeles, Cal. Filed April 16, 1912. Serial No. 691,246.

1,038,314—Pneumatic Tire. Frank Doherty and William John Robbins, Wellington, New Zealand. Filed June 7, 1910. Serial No. 565,622.

1,038,319—Rotary Valve for Internal Combustion Engines. Eleuthere Paul du Pont, Montchanin, Del. Filed May 13, 1910. Serial No. 561,038.

1,038,344—Tire Boot Holder. Webster D. Gilbert, Johnstown, N. Y. Filed May 11, 1912 Serial No. 696,619.

1,038,360—Tire Protector. Rhoda C. Harris, Pittsburgh, Pa. Filed October 25, 1911. Serial No. 656,738.

1,038,371 — Reversible Two-Cycle Engine. Charles Hull, Bloomville, Ohio. Filed August 8, 1911. Serial No. 642,914.

1,038,372—Detachable Rim for Vehicle Wheels. Miller Reese Hutchison, Summit, N. J. Filed April 29, 1909. Serial No. 492,926 Renewed July 20, 1912. Serial No. 710,696.

1,038,374—Combined Air Compressor and Shock Absorber. Joseph D. Jackson, Washington, Pa. Filed December 23, 1911. Serial No 667,519.

1,038,379—Traction Engine. Marx Jens Stickney, S. D. Filed March 22, 1911. Serial No. 616,117.

1,038,401—Starting Device for Internal Combustion Engines. Robert W. Long and George Buress, Indianapolis, Ind.; said Buress assignor to said Long. Filed August 10, 1911 Serial No. 643,461.

1,038,424—Rotary Explosive Engine. Joseph M. Novy, St. Louis, Mo. Filed September 5, 1911. Serial No. 647,753.

1,038,433—Tire Alarm. Joseph B. Polo, Clear Lake, S. D. Filed January 27, 1912. Serial No. 673,925.

1,038,446—Shock Absorber for Vehicles. Charles T. Schoen, Media, Pa. Filed March 5, 1912. Serial No. 681,860.

1,038,451—Current Distributor and Timer. James M. Smith, Philadelphia, Pa., assignor of one-half to Wilson D. Craig Wright, Philadelphia, Pa. Filed January 13, 1909. Serial No 472,066.

1,038,494—Dynamo Electric Machine. Lewis W. Nelson, Philadelphia, Pa. Original application filed May 16, 1910. Serial No. 561,546 Divided and this application filed November 15, 1910. Serial No. 592,488.

1,038,501—Wheel. William Hallinan, Greenville, Ky. Filed August 30, 1911. Serial No 646,873.

PATENT DESIGNS

43,015—Motor Car Hood. Ferdinand Porsche, Wiener-Neustadt, Austria-Hungary. Filed June 3, 1912. Serial No. 701,459.

FLYWHEEL Dynamo for Motor Cars—No. 1,038,494. To Lewis J. Nelson, Philadelphia, Pa. Original application filed May 16, 1910, divided, and this application filed Nov. 15, 1910, dated Sept. 10, 1912. Incorporated in the clutch assembly, in the place of the usual flywheel, this dynamo is for the purpose of generating an electric current for uses in a motor car, such as lighting, starting, etc. It consists of a direct-current dynamo, the fields of which are carried on cores, parallel to the shaft, and secured to a stationary shell, which constitutes the casing of the apparatus. The armature is in the form of a wound disk, secured to an annular plate which forms integrally one member of the clutch, and which is bolted to a cylindrical drum, which in turn is bolted to an integral flange on the shaft. To this drum is secured the commutator. The complete assembly is housed by the shell, being entirely separated from the clutch housing by a deep overlap between the revolving disk and the stationary shell,

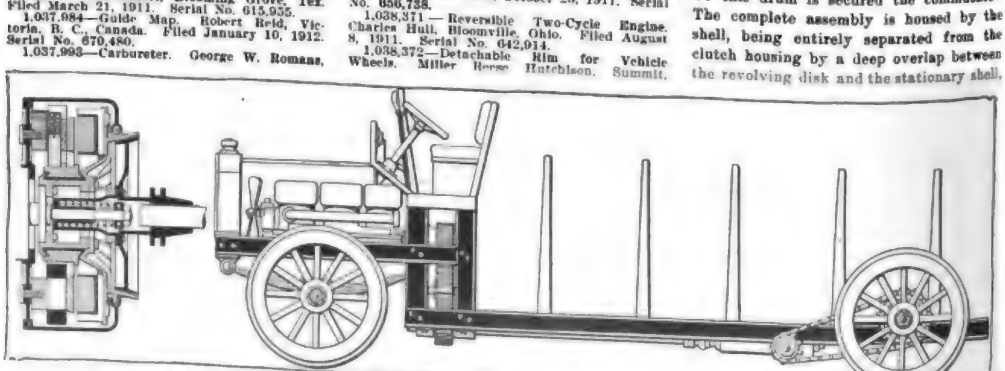


FIG 2—NELSON FLYWHEEL GENERATOR AND SOLOMON LEVY'S LOW-SUSPENSION TRUCK FRAME

and by an additional oilproof and waterproof gland, between these members, which obviates the use of packing.

Low-Hung Motor Truck—No. 1,038,162—To Solomon J. Levy, San Francisco, Cal. Filed Apr. 6, 1911, dated Sept. 10, 1912. Partaking of the nature of both the underslung and overhung principles of suspension, this design contemplates the carrying of the load very low, thus facilitating its quick loading and unloading, and rendering the vehicle more stable. The frame, the construction of which is the feature of the patent, is hung below the rear axle and above the front axle, being composed of two sections, one lower than the other, their junction being made by two vertical members at the forward end of the truck body, which extend upward to support the seat, and encloses a gearing mechanism which conducts the power from the shaft of the engine, which is supported by the forward portion of the frame, to the driveshaft, which is below the underslung rear portion of the frame. The design shows final drive by means of double chains. The floor of the truck is carried directly over the frame members.

Ignition Timer and Distributor—No. 1,038,451.—To James M. Smith, Philadelphia, Pa., assignor of one-half to Wilson D. Craig Wright, Philadelphia, Pa. Filed Jan. 13, 1909, dated Sept. 10, 1912. As a part of a mechanical-break, jump-spark system, the timer and distributor, to which this patent relates, comprises a distributing disk and revolving arbor, suitably insulated by non-electric disk, provided with a metal pivot, upon which a contact making and breaking device is mounted. This consists of a pair of pivoted arms, one of which moves into and out of contact with a contact screw, mounted on the supporting member of the insulating element, and which are actuated by a serrated disk and sleeve mechanism adapted to make a positive mechanical contact of short duration. Another similar device is used to make a long contact of long duration, for starting.

Graphic Road Map—No. 1,037,984—To Robert Reid, Victoria, B. C. Filed Jan. 10, 1912, dated Sept. 10, 1912. This patent relates to a method of making guide maps. One side of the sheet is provided with a tabulated list of all of the towns shown on the map on the reverse side of the sheet. These tabulations are two in number, comprising two separate sets of names. The location of the points listed on the face of the map is determined by means of key numbers and letters, a designation for each name, to correspond with the position o fthe point on the map, similarly marked. The numbers and letters are arranged for ready location on the face of the map, and listed alphabetically in the tabulated key on the revrse side. To locate a given town, therefore, on the map, the name is first found in the table, and the designation thereof with respect to the key noted. The map is then reversed, and the letter or number located in its numerical or alphabetical position on the map. Unspecified means are also set forth in the claims to locate a required point on the map from the back, marking it for reference on the front.

Stewart Magnetic Speedometer—No. 1,038,016.—To John K. Stewart, Chicago, Ill. Filed July 5, 1911, dated Sept. 10, 1912. This speedometer operates on the magnetic drag principle, the principal elements comprising a revolving magnet, geared to the driveshaft, encompassed by an oscillating, non-magnetic member, in form an inverted cup, whose oscillation, as induced by the magnetic drag of the revolving magnet, is restricted by a hair spring. Reading is by means of calibrations on the face of the non-magnetic field piece through an index opening in the dial face. The features of the invention are the means of adjusting these members. The non-magnetic element is mounted on a frame which is adapted to be moved axially to alter its relation to the magnet, and the degree of effect produced thereby; and an adjustment between the scale of calibrations on the oscillating cup and the index opening, for the purpose of correcting the accuracy of the instrument.

Friction-Drive Mechanism—No. 1,037,869.—To John G. Coleridge, Detroit, Mich, assignor to Coleridge Commercial Car Co., Detroit, Mich. Filed Mar. 30, 1911, dated Sept. 10, 1912. Applied to a motor truck, otherwise substantially standard, this provides a friction drive at all reductions and reverse gears, and a direct drive on high speed. The engine shaft is separated from the drive shaft amidships, by a clutch, engagement of which provides direct drive. Between the clutch and the flywheel are two silent chain drives, driving two countershafts, parallel to the drive shaft, which in turn drive, through bevel gears, a pair of opposed friction disks, mounted behind the clutch, between two cross members of the frame. A friction wheel, keyed to the driven shaft, and adapted to slide upon it longitudinally, engages on opposite points on its periphery with these disks, at a ratio of rotating speed proportional to the distance from their centers of the point of contact, reverse being obtained by moving the friction wheel past the center of the disks. The control of the two friction members is co-acting, the release of the friction disk-and-wheel engagement operating the direct-drive clutch, a neutral between the two being provided.

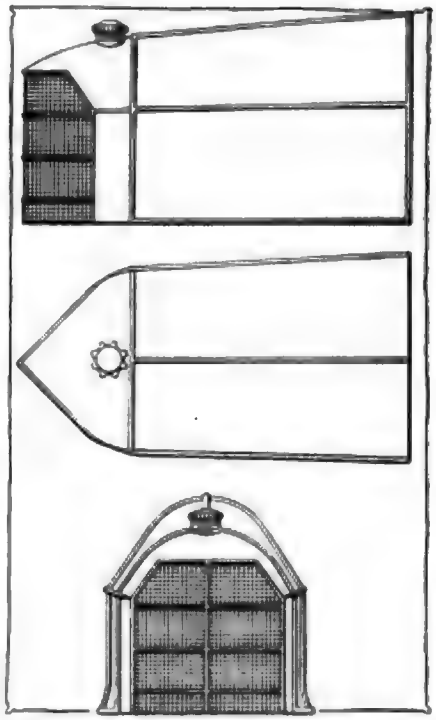


FIG. 4—GERMAN STREAM-LINE HOOD

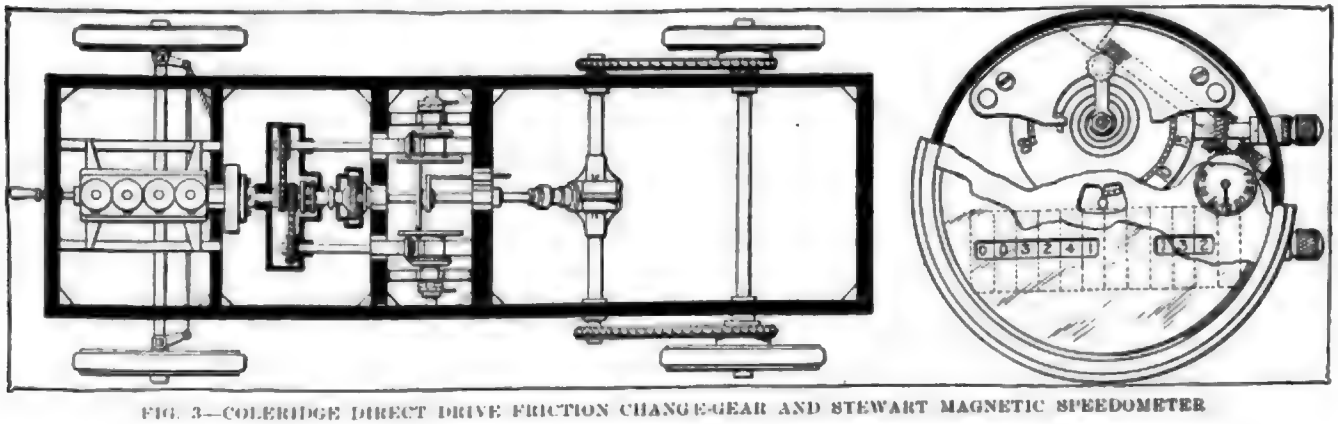


FIG. 3—COLERIDGE DIRECT DRIVE FRICTION CHANGE-GEAR AND STEWART MAGNETIC SPEEDOMETER

Development Briefs in Accessory Field

New Pleated Curtains Appear—Weston-Mott Produces New Pressed Steel Rear Axles—New Dope for Fuel—Strength of Bair Top Hinges Proven by Big Top

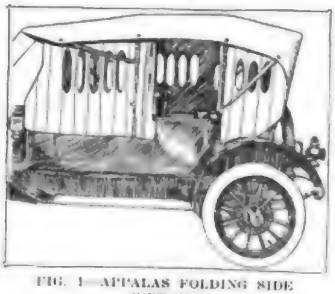


FIG. 1—APPALAS FOLDING SIDE CURTAINS

New Weston-Mott Axles

TWO new pressed steel axles have been designed by the Weston Mott Co., Flint, Mich. They are made with the split in the vertical plane. A flange is turned up on the ends of the tube, to which the pressed steel brake flange is spot-welded. The hub bearings are supported in tubes inserted and fastened in the ends of the housing, acting also as reinforcements. The shafts are turned large at the wheels, tapering toward the inner ends to prevent crystallization, and are carefully heat-treated. Single-bearing hubs are used and specially cut, 14½ size gears. New Departure bearings are used, and the axle is designed with especial attention to ease of adjustment.

Herroline Gasoline Improver

William H. Herron is the discoverer of a substance for the improvement of gasoline for power purposes that is in many ways unique. The Improved Gasoline and Oil Co., Chicago, is the compounder. This compound is a liquid, similar in appearance to gasoline, claimed to be beneficial to gasoline, and harmless to machinery. It is claimed to prevent carbon deposits, to economize in gasoline, to facilitate starting, to make the engine more flexible, to lessen smoke and odor, and to reduce the freezing point, permitting the car to be started in lower temperatures than with the use of pure gasoline.

The theory of its action is that Herroline, being 40 degrees higher in temperature than gasoline at all times, raises the temperature of the treated fluid; that Herroline refines the gasoline, making it more volatile, causing it to vaporize more quickly; and to go farther.

The reason for the higher temperature of Herroline under certain conditions than gasoline under similar conditions, is that Herroline evaporates much slower than gasoline. This seems strange, as the average layman is apt to consider the temperature of a liquid dependent on the surrounding air; yet if any liquid be tested by the aid of a thermometer, it will be found cooler than the atmosphere, due to the radiation of its heat into the surrounding atmosphere as induced by evaporation. The greater the rate of evaporation, the greater the radiation and consequent lowering of the temperature of the liquid. It would appear from this, then, that this substance would rather retard the vaporization of gasoline than accelerate it; but this is not the case, for the reason that while the small amount of Herroline, being warmer than the gasoline, radiates its heat to the latter, warming it, the amount of the adulterant is not sufficient to materially affect the volatile properties of the fuel, and by its own radiation, as induced by the lower temperature of the gasoline, is rendered, itself, more volatile, so that the whole mass, being warmer than an equal portion of gasoline, is rendered more volatile, in accordance with the principle of the increase of the rate of evaporation of liquids under the influence of heat.

It is asserted that gasoline treated at the proportion of two teaspoonfuls of Herroline to the gallon, will be raised 35 degrees in temperature; that one gallon of Herroline will suffice for 200 gallons of gasoline; that its effect is permanent; that the fuel required to run the engine is reduced 50 per cent by such treatment; and that while its use increases the cost of fuel 9½ cents per gallon, gratifying economy is effected. Chemical analysis fails to reveal any change in the nature of the gasoline thus treated, it is averred.

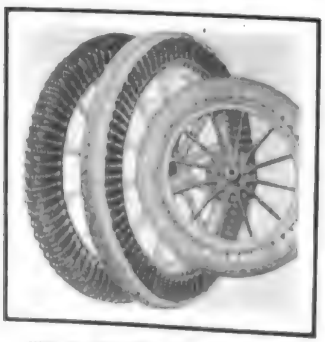


FIG. 2—BURGESS METALLIC TIRE

New Sliding Curtains

Accordion pleats seem to be the style, at least in top curtains, as is evidenced in the Applas Inside Curtain, the product of the Applas Curtain Co., Detroit, Mich., which is the latest development of the concertina effect in side-curtains. These curtains are made in folding sections, which are hung on a nickel-plated rod, disposed between the bows of an extension top, by small metal rings. This construction permits them to be slid back against the sides of the top bows, to permit ingress or egress from the doors, or to fold them out of the way, the rods upon which they slide clamping them securely under the bow overhead and invisible, when not in use. These curtains need never be removed from the top, as they consume a negligible amount of space when folded, do not materially detract from the appearance of the car, and may be folded back with the top, wtihout removal. They are placed inside of the bows in the latest approved manner, and may be adjusted instantly from either inside or outside of the car, or while the car is in motion. The celluloid windows are sectional, each section being of small size, and proof against cracking. Fig. 1 shows these curtains in place, one section being open.

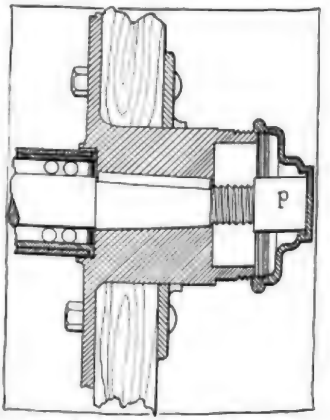


FIG. 3—NEWTON WHEEL PULLER

Strength of Bow Hinges Demonstrated

Equipped with Bair bow hinges, the White car, Fig. 6, is shown with the largest folding top ever constructed. This car, which has a wheel base of 159¾ inches, and seats ten people, requires a top 152 inches in length. For this great spread eight bows are used, which are supported in but five bow sockets. These are of Bair manufacture, and permit two bows to be hinged at an angle of 75 degrees. This is but an elaboration of the principle used in tops of more moderate size, as employed in standard five and seven passenger cars, which enables the latter sizes to use six

Novelties for Use of the Motoring Public

Wheel-Puller of Extreme Simplicity—Wire Hinges Take the Place of Belt Lacing—Built-up Resilient Tire Uses Steel Springs—Shock Absorber Maker Produces Plug

bows with but four sockets. This allows the top to fold into a very compact unit, and greatly improves the appearance, both folded and extended. The top shown in the illustration folds to a size practically no larger than the ordinary top of smaller size. The hardware that makes this possible is manufactured by the Auto Specialties Mfg. Co., Chicago.

Simple Wheel Puller

Requiring no additional appliances to the usual parts of a wheel, with the exception of a small brass cylindrical plug, the wheel puller shown in Fig. 3 is perhaps the simplest device of this character yet introduced. Of course, it does not contemplate pulling wheels that are bound so tight as to require unusual methods of extraction, being designed for use with ordinary non-floating or semi-floating rear axle wheels. The device consists of a special construction of the hub cap, wherein it is adapted to receive the brass filler plug, P between itself and the axle end. A few light taps on the end of the cap with the hammer suffice to start the wheel, by concussion, the wheel being drawn from the axle thereafter by screwing up the hub cap. The filler plug is carried in the tool box when not in use.

C. H. Newton, East Orange, N. J., is the designer of the device.

Conn's Belt Hinges

For flat fan belts, the belt hinge shown in Fig. 4, is a very successful substitute for belt lacing. They are composed of sharp wire clinches, turned once each about a hollow tube, and are applied as shown. They hold the belt firmly, and in many places, and, due to the hinge action of the wires on the tube, are more flexible than is usual with metal lacings. They are made in sizes for belts from ⅝ to 1 inch in width, and require no tools other than a hammer to apply.

The operation is as follows: The hinge members are spread, is in the figure, and laid on an iron block. Each belt end is then inserted between the points of one of the sets of clinches and driven in with a dent, as shown. When these dents are flattened out, the points will clinch. J. C. Conn, New York City, is the manufacturer of three sizes of these hinges.

Burgess Spring Tire

Using springs for the resilient element, the Burgess patent tire, shown in three stages of manufacture in Fig. 2, is the product of the Burgess Tire and Mfg. Co., Brookfield, Mo. The method of employing the spring is new. They are helical in form, and are secured at each end to the opposite sides of the rim, arching up to form the tire, in substantially the same form as a pneumatic tire. There are seventy-four of these springs to a 30-inch tire, being equally spaced about its entire circumference. This forms the core of the tire, and is underlayed first by a tread base or binder of chrome leather, which is disposed about the tread surfaces of the springs, with leather keys in the interstices between them, to keep them properly spaced. Over this is then stretched a canvas envelope, which completely encloses the assembly, excluding dust and water. Over this a detachable steel studded leather tread is placed, which may be replaced by a new one when worn, wtihout disturbing the core assembly. It is averred by the

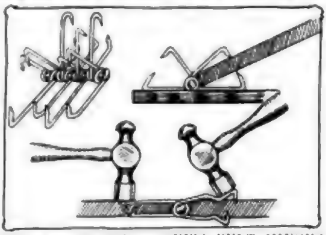


FIG. 4—APPLYING CONN'S BELT HINGES

manufacturers that this tire will respond to 3 pounds pressure. It is the intention of the makers to guarantee a mileage of 17,000 miles.

Hartford Two-Piece Plug

Newest among the separable type of spark plugs, the Hartford two-piece plug, Fig. 5, is the latest product of the Hartford Suspension Co., Jersey City, N. J., maker of Truffault-Hartford shock absorbers and the Hartford jack. In this plug the main shell acts merely as an adapter, permanently screwed into the

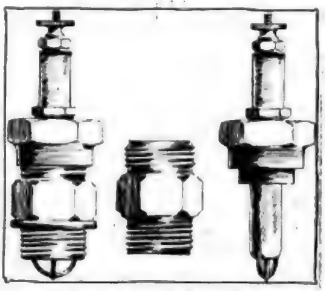


FIG. 5—HARTFORD 2-PIECE PLUG

cylinder, into which the core is screwed on a taper thread, the core being an entirely separate and self-contained unit. Once applied, the shell, which is furnished in A. L. A. M. standard threads with a copper-asbestos gasket, never need be removed from the cylinder, as all adjustments, cleaning and renewals on the core may be made by separating it from the shell. The core is threaded over the shell on a taper, making gaskets here unnecessary; the cylinder threads being straight.

The taper thread makes the removal of the sparking element easy, and dispenses with gaskets at this point, while the straight thread in the cylinder removes the danger of cracked cylinders, due to too tight screwing of the taper thread into a cold cylinder, which is attendant upon tapered cylinder threads. The sparking gap of this plug is formed between a straight central positive electrode and a soft-iron loop, which extends from the core shell down the lower porcelain, around the central electrode. The points are easily cleaned, and well separated from the shell, so that carbon on the surface of the shell has no effect upon the sparking points.

Should a new plug be required, the old shell may be left in the cylinder, and the new core used only, with the old shell.

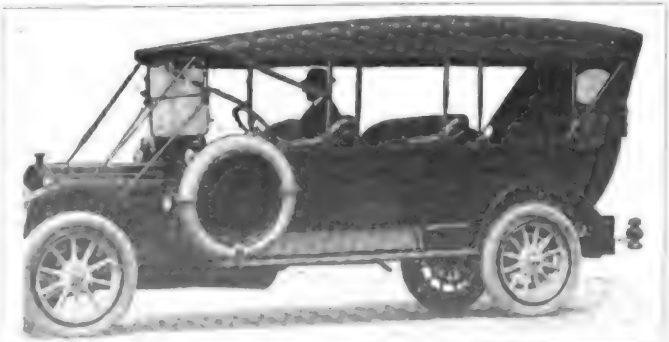


FIG. 6—GIGANTIC TOP EQUIPPED WITH BAIR BOW HINGES

Brief Business Announcements

Recent Agencies Appointed by Car and Truck Manufacturers

PLEASURE CARS

Towns—	Agent	Car
Avondale, Colo.	A. E. Smith	R. C. H.
Abberville, S. C.	Abberville Motor Car Co.	Cole
Avondale, Pa.	M. F. Morris	R. C. H.
Butte, Mont.	Montana Auto Service Co.	R. C. H.
Bay City, Mich.	Wolverine Auto Co.	Cole
Boston, Mass.	George Grow Auto Co.	R. C. H.
Columbus, Ga.	S. G. Brannon	R. C. H.
Chicago	Deibler Motor Car Co.	Great Western
Clinton, Ia.	Model Auto Co.	Cole
Coshocton, O.	W. E. Layman	R. C. H.
Chicago	John W. Hayden	Nyberg
Canandiagua, N. Y.	Claude O. Hallenbeck	R. C. H.
Demopolis, Ala.	Leon Morris	R. C. H.
Detroit, Mich.	Thompson Auto Co.	Alco
Delta, Pa.	C. F. Ramsay	Ford
Delta, Pa.	C. F. Ramsay	Buick
Delta, Pa.	C. F. Ramsay	Overland
Duluth, Minn.	Johnson Motor Co.	Cole
Erie, Pa.	Potter-Burgess Motor Co.	Cole
Elmore, O.	Henry Lohr	Empire
Ft. Wayne, Ind.	Fred H. McCullough	Cole
Galesburg, Ill.	Galesburg Machine Works	Cole
Galveston, Tex.	John Christiensen & Co.	Cole
Grand Rapids, Mich.	Cowdin and Woodland	Cole
Galeton, Pa.	H. C. Shaw	R. C. H.
Hamilton, O.	F. H. Graf Motor Car Co.	Cole
Havana, Cuba	Villamil and Miller	Alco
Kensington, Minn.	Oslerberg and Colmark	R. C. H.
Kansas City, Mo.	Williams Motor Car Co.	Alco
Lancaster, Pa.	H. M. Vondersmith	Hupp-Yeats
Larimore, N. D.	Larimore Auto Co.	R. C. H.
Lima, O.	Thomas Motor Car Co.	Cole
Longmont, Colo.	Timmons Auto Co.	R. C. H.
Low Point, Ill.	Banta Brothers	Cole
Lynn Center, Ill.	A. F. Anderson	R. C. H.
La Porte, Ind.	Indiana Auto & Supply Co.	R. C. H.
Milwaukee, Wis.	Edgar F. Sanger Co.	Stearns-Knight
Milwaukee, Wis.	Edgar F. Sanger Co.	Marion
Milwaukee, Wis.	Moline Garage Co.	Moline
Milwaukee, Wis.	R. D. Rockstead	Paige
Milwaukee, Wis.	R. D. Rockstead	Warren
Meridian, Miss.	A. Y. Harvey	R. C. H.
Mendota Ill.	P. F. Sondergroth	R. C. H.
Minneapolis, Minn.	Downs Co.	Alco
Monticellow, Minn.	Henry Cain	R. C. H.
Mechanicsville, N.Y.	G. M. Fort	Franklin
Manistee, Mich.	National Garage & Sales Co.	Cole
Memphis, Tenn.	Jerome P. Parker-Harris Co.	Cole
Myersdale, Pa.	Myersdale-Overland Co.	Cole
Newburg, N. Y.	Mogul Auto Co.	R. C. H.
Ottawa, Ill.	Standard Garage	R. C. H.
Oakland, Cal.	J. C. Lewis Motor Co.	Cole
Ottawa, Ill.	Ottawa Garage Co.	Cole
Pawtucket, R. I.	H. W. Bowen	Cole
Portland, Ore.	Neate and McCarthy	Cole
Railroad, Pa.	H. Schroeder	Overland
Reading, Pa.	Merchants' Auto Service Co.	Alco
Remington, Va.	Remington Motor Car Co.	R. C. H.
Rochester, N. Y.	Pawlik & McGuidwin	Alco
Rockford, Colo.	Lewis Brothers & Johnson Merc. Co.	R. C. H.
San Antonio, Tex.	Guarantee Motor Car Co.	Cole
Savannah, Ga.	J. C. Lewis Motor Co.	Cole
Sheboygan, Wis.	Rummele Garage Co.	Detroit
Sheboygan, Wis.	Sheboygan Auto & Supply Co.	Cadillac
Stevens Point, Wis.	P. F. Kosholleck	Apperson
Stevens Point, Wis.	P. F. Kosholleck	Reo
Stewartstown, Pa.	August Neller	Ford
Stewarstown, Pa.	August Neller	Buick
Stewartstown, Pa.	August Neller	Overland
St. Cloud, Minn.	George E. Guide	R. C. H.
St. Johnsville, N. Y.	B & C Auto Co.	Cole
St. Louis, Mo.	R. C. Jones	Hupp-Yeats
St. Louis, Mo.	Colonial Automobile Co.	Flanders
St. Louis, Mo.	D. Perry Lewis	Moon
Syracuse, N. Y.	Jefferson Garage Co.	Alco
Toledo, O.	Bunnell Auto Sales Co.	Cole
Urbana, O.	Prince Motor Car Co.	Cole
Vancouver, B. C.	B. C. Automobile Co., Ltd.	Cole
Visalia, Cal.	James L. Robertson	R. C. H.
Washington, D. C.	A. D. Lomer Co.	Penn
Waterloo, Ia.	Burd Auto & Supply Co.	Cole
Webb City, Mo.	C. H. Beck	R. C. H.
Whittier, Cal.	H. L. Triplett	R. C. H.
York, Pa.	South Pennsylvania Auto Co.	Apperson

TRUCKS

Australia	American Motor Truck Co.	Federal
Corsicana, Tex.	L. H. Lee	Kelly
Cumberland, Md.	Queen City Garage	Kelly
Emporia, Va.	Emporia Machine Co.	Kelly
Lynchburg, Va.	Monte Dingee	Kelly
Portsmouth, O.	David Stahler	Federal
Richmond, Va.	Shenandoah Motor Co.	Kelly
St. Louis, Mo.	Allen Baker	Federal
Toronto, Ont.	Shaw Overland Sales Co.	Gramm
Vancouver, B. C.	Vancouver Isle Motor Co.	Federal

HONEOYE, N. Y.—F. Wolfsberger is planning construction of a two-story concrete public garage.

Spokane, Wash.—W. C. Ruckert has been appointed Spokane manager of the Goodyear Tire and Rubber Co., succeeding C. B. Clement, who has joined the Studebaker agency in Portland, Ore.

Columbus, O.—A readjustment of the sales force of the United Motor-Columbus Co. in a large portion of Ohio, Kentucky and West Virginia has been made. F. P. Corbett, who has been in charge of the Columbus distributing point for some time, will be district manager of the three states. The wholesale and retail end of the business will continue in the same location, 246-248 North Fourth street.

Syracuse, N. Y.—The Jefferson Garage Co., springing from the Jefferson Auto Co., will open what is said to be the largest garage between New York and Buffalo. There is a four-story building and a frontage of 100 feet, the structure containing mechanical departments, repair shops and wash room on third and fourth floors, with the executive offices and sales rooms on the lower floors. The front is of colonial design and the interior finish is of natural woods.

Omaha, Neb.—The Cole Motor Co. of Omaha, Neb., has moved into larger quarters at 1910 Farnum street.

Baltimore, Md.—The Keeton car is now in the Baltimore field. It is being represented here by the Baltimore Garage Co., 1306 Morton street. This company will look after Baltimore city and county.

Boston, Mass.—F. N. Phelps and A. F. Neale, representing the Baker Motor Vehicle Co. in Boston and surrounding territory, have taken new headquarters at 801 Boyleston street.

Minneapolis, Minn.—The Northwestern Automobile Co., 217 Fourth street S, Minneapolis, has contracted for the Krit car in Minnesota, the Dakotas and northern Wisconsin. The Northwestern company has handled the Ford car for 8 years. Although the contract ended September 3, it will take care of the Ford business another month, when the Ford branch will be installed. The Northwestern company is incorporated at $100,000. W. E. Wheeler is president; William Eggleston is vice-president; J. R. du Sault is secretary.

Honeoye, N. Y.—F. Wolfsberger, Honeoye Falls, N. Y., is planning construction of a two-story concrete public garage.

San Francisco, Cal.—A. C. Wheelock, has been appointed assistant manager of the Pioneer Automobile Co., distributor of the Chalmers and Flanders electric in northern California. Wheelock has been associated with the Pioneer for many years, latterly as manager of their Fresno branch. He will make his headquarters in San Francisco.

Minneapolis, Minn.—The Pence Automobile Co. will commission its own exclusive automobile freight train to travel all winter between Flint, Mich, and Minneapolis, to haul 2,500 Buick cars from the factory to the northwestern distributing agency. Each freight car will carry three Buicks, which makes 150 to the train. The plan has been formulated by H. E. Pence, president, to insure enough cars for the winter's haul. The company has to guarantee the railroad 6 months'

employment for the cars. The Buicks are for distribution in Minnesota, Montana, the Dakotas and Northern Wisconsin.

Rochester, N. Y.—William Edwards has withdrawn from the firm of Edwards & Postier. The concern now is West & Postier.

Des Moines, Ia.—R. C. Fletcher, junior member of the Van Vliet-Fletcher Auto Co., local agent for the Studebaker lines, has withdrawn from the firm and will devote his entire time to real estate.

Buffalo, N. Y.—The Baker Brothers Motor Car Co., distributor for the Cole in western New York, has changed its name to the Cole Motor Co. It has moved into new salesrooms at 1227-1229 Main street.

Albany, N. Y.—The W. M. Whitney Co., which recently purchased the interests in this city of the United States Motor Co., which local concern was known as the United States Albany Co., is handling the Fiat, Maxwell and Mercer cars.

San Francisco, Cal.—The Matheson Sales Co., distributor of the Warren and Matheson cars, which heretofore has made its headquarters across the bay in Oakland, has now centered all its energies in a new building on Van Ness avenue, near Pine street.

San Francisco, Cal.—J. W. Harrison, formerly connected with the Woods electric in Chicago, has been appointed manager of the Woods electric department of the Pacific Motor Car Co., distributor of the Woods and the Stevens-Duryea in northern California.

New York—Charles E. Miller, the accessory maker and jobber, will move his branch store in Atlanta, Ga. He has leased a storeroom in a new building, nearing completion, at the corner of Harris and Peachtree streets. The new address in Atlanta will be 259 Peachtree street.

San Francisco, Cal.—Frank E. Carroll has been appointed manager of the San Francisco branch of the Goodyear Rubber and Tire Co. Carroll has been associated with the sale of Goodyear tires on the Pacific coast for several years. For some time past he has been manager of city sales in the local branch.

Detroit, Mich.—The Detroit R. C. H. Co., local sales agents for R. C. H. cars, with display rooms and offices at 1225 Woodward avenue, report that its season's business to date has been phenomenal, having placed over 150 cars in Wayne county so far this year with every indication that it will top the 200 mark before the fall season closes.

Vancouver B. C.—The new garage for the Dissette Motor Co., at 1254 Hornby street, will share with a somewhat similar building now being erected beside it, the distinction of being the largest garage on the Pacific coast, with the floors absolutely clear of posts and supports. The new structure will have a frontage of 50 feet on Hornby street and a depth of 120 feet and will be three stories high. It will be of re-inforced concrete and will be fireproof throughout.

Toronto, Ont.—The Provincial Motor, Ltd., Toronto, distributor for the Cole, has changed its name to the Cole Motor Car Co.

Seattle, Wash.—Ira D. Lundy will hereafter handle the R. C. H. cars in Seattle. This line was formerly handled by F. H. Barshar Co., which hereafter will devote all its time to selling Cole and Stevens-Duryea cars.

Philadelphia, Pa.—The F. B. Stearns Co. of Cleveland, has opened a branch house in Philadelphia, located at 449-451 North Broad street. G. Hilton Gantert has been appointed manager of the branch, with Evans Church as sales manager.

San Francisco, Cal.—C. S. Richardson, for several years manager of the Reliance Automobile Co., distributor for the Knox pleasure cars and trucks and the Detroit electric in this territory, recently resigned to take over the distribution of Punctureless in California.

San Francisco, Cal.—The Pioneer Automobile Co., of San Francisco, opened its new branch in Oakland during the past week. The new building is a spacious structure with a large frontage on Twenty-fourth street. C. A. Penfield is manager of the Oakland branch.

Kansas City, Mo.—W. F. Kneip and E. F. Williams, new Franklin dealers, have opened up a salesroom and garage at 3320-3322 Main street. Before taking up the Franklin dealership here both Mr. Kneip and Mr. Williams were for 6 years connected with the engineering department of the H. H. Franklin Mfg. Co., in Syracuse.

Rochester, N. Y.—Jacob Messner and John Swensen, proprietors of the Powers hotel, have purchased property at Plymouth avenue and Church streets, costing $17,000 for the construction of a garage for guests of the hotel. The property is 65 feet front and 150 feet in depth and the garage will be the largest in Rochester.

Des Moines, Ia.—The United Motors Des Moines Co. has announced a change in the methods of conducting its business here. In the future the retail department will be conducted entirely separate from the wholesale department and will be known as the Capital Auto Co. A. G. Bigelow, treasurer of the United Motors Des Moines Co., will be manager. G. W. Jones will continue as head of the wholesale department.

Portland, Ore.—A. S. Eldridge, a building contractor of Portland, together with Mel G. Johnson, manager of the Howard Automobile Co., of Portland, and James G. Fenton, have formed a corporation to be known as the Buick Auto Co., and have secured the agency for the Buick and National lines in western Washington. The new company have taken lease of a show room and shop room in the new Davies building on the corner of Pike and Broadway in Seattle.

College Point, N. Y.—The American Hard Rubber Co. contemplates erection to its plant of a three-story brick addition costing $30,000.

Toledo, O.—Charles P. Landman and Warren Griffith have incorporated as the Landman-Griffith Motor Co. A brick building will be erected on Madison avenue for the new firm, which will be ready for occupancy December 1.

Louisville, Ky.—The Zilio Sales Co., of Louisville, has acquired the general agency for the Zilio tire filler in Kentucky, southern Indiana, and North and South Carolina. This concern has opened an office in the Courier-Journal building in Louisville.

Toronto, Ont.—The Norwalk Motor Car Co. of Canada, corrects a statement to the effect that the Matheson Automobile Co. is the Canadian distributor of the Norwalk. A factory branch has been established here by the Norwalk company with M. D. Coltman in charge.

Atlanta, Ga.—C. E. Holmes, formerly of the Diamond Rubber Co., Goodyear Tire and Rubber Co., and the late southern manager of the Swinehart Tire and Rubber Co., has resigned his position to enter into the retail tire and vulcanizing business in Birmingham.

Oshawa, Ont.—The McLaughlin Carriage Co., of Oshawa, has taken out a permit to build an addition to its factory, two stories high, 250 feet by 60 feet. Its present manufacturing facilities are inadequate to meet the increasing demand for McLaughlin-Buick motors.

Toronto, Ont.—The Rubber Tire Wheel Co. agency, sales company here for the productions of the Gutta Percha and Rubber Mfg. Co., including Fisk and Kelly-Springfield tires, has discontinued business. The Gutta Percha will in future conduct the sales of its own products.

Portland, Ore.—Another firm made its appearance in Portland's row during the past week. The new firm is composed of F. J. Finger and H. L. Mann, recently with the Packard company, of New York. The new firm has secured the agency for the Stutz and will be located at 59-61 North Twenty-third street.

Utica, N. Y.—G. Wilmer Creswell, formerly with H. H. Cooper & Co., has purchased a half interest in the Utica Electric Garage Co., 75 Cornelia street, which concern has been conducted for past 4 years by Walter R. Shiller. The new firm will be Schiller & Creswell. The agency for the Detroit electric will be continued.

Detroit, Mich.—Andersch Brothers, fur dealers of Minneapolis, Minn., have entered the motor business as distributors of the Abbott-Detroit line in the states of Minnesota and North and South Dakota. The new concern is the Andersch Brothers Motor Co., and contract has already been let for a salesroom and headquarters at Minneapolis. George B. Levy has been

appointed general manager of the new company.

Hamilton, Ont.—The Jackson Automobile Co., Jackson, Mich., is reported to be considering the location of a Canadian branch of its factory in Bartonville, Ont.

Philadelphia, Pa.—Carroll A. Haines & Co., Baker electric distributors in Philadelphia, have moved to their new and larger sales rooms at 1927 Market street.

Kansas City, Mo.—A change in the Cole Kansas City distributing house has taken place. H. J. Clark who formerly worked for the Cole distributors in Kansas City, secures the distributing business. He is associated with J. H. Runcie, a paper box manufacturer. The firm will do business under the name of the K. C. Cole Motor Co.

Baltimore, Md.—While work is progressing on the new garage of the Colonial Motorcar Co., at North avenue near Charles street, the company has established temporary location in the Brown Taxicab Co. building. The new building will be ready for occupancy about November 1. The Colonial Garage Co. handles the Studebaker line.

Indianapolis, Ind.—With an authorized capitalization of $10,000, the Showalter Mfg. Co. has recently been reorganized and incorporated in Indianapolis. The company manufactures motor car bodies and the principal stockholders are E. W. Showalter, William Small and H. G. Showalter, who are also the directors.

Akron, O.—The Goodyear Tire and Rubber Co. moved into the new office building recently. The new structure is one of the most modern in the United States.

Dallas, Tex.—L. A. Smith, for many years with the Studebaker company in Dallas, has resigned and will enter business for himself. He has formed a partnership with G. L. McKinney, of Amarillo, Tex., and the two men will open an agency covering Hunt, Collin and Rockwell counties. They will sell the Studebaker.

San Francisco, Cal.—The Bonnheim-Moore Motor Car Co., which have secured the Henderson agency for northern California, Nevada and Hawaii, has taken quarters in the big Goodyear tire building on Van Ness avenue, at the corner of Sutter street. Bonnheim is a wealthy California merchant, and Harry G. Moore comes to San Francisco from Chicago.

San Francisco, Cal.—The Speedwell Motor Car Co. of Dayton, O., has established a branch in this city, taking over the interests of the Speedwell Motor Car Co. of California. The new branch is under the management of R. Harry Croninger, who is manager of the motor truck department of the Dayton factory. While retaining his factory position, Croninger has no definite plans for returning to Dayton.

New York—John N. Stockfisch, formerly with the Havoline Oil Co. as New York division manager, has resigned, to accept a position in a like capacity with the Texas Oil Co., 17 Battery place, New York city, manufacturer of Texaco oils.

Indianapolis, Ind.—The State Automobile Co. has taken the agency for the Marathon and will also distribute the Krit in Indiana. The company formerly had the Marathon agency, which is now distributed by the A. and M. Service and Sales Co.

Minneapolis, Minn.—A. N. Smith, formerly with A. F. Chase & Co., transfers with the Oakland car from that firm to the factory branch as sales manager. H. W. Jameson has been transferred from the Buick end to the Oakland branch. He has been traveling inspector of agencies in Montana. E. W. Shepherd will be manager of the St. Paul agency.

Cleveland, O.—F. E. Richardson has withdrawn from the firm of Richardson-Neighbors Motor Co., Cleveland, distributor for the Cole and Hupmobile. He has organized the Richardson Motor Car Co. and will be located next door to the old company. Mr. Richardson will handle the Cole lines exclusively; while Mr. Neighbors will look after the Hupmobile interests.

Recent Incorporations

Albany, N. Y.—Empire Essenkay Co.; capital stock, $10,000, agents for tire filler, incorporators, H. C. Cowen, J. W. Cumming, H. C. Wilbur.

Benton, Ill.—Benton Motor Car Co.; capital stock, $75,000; to manufacture and deal in motor cars and accessories; incorporators, H. Stetlar, W. S. Cantrell, A. H. Fraunfleder.

Beverly, Mass.—Cameron Mfg. Co.; capital stock, $300,000; to deal in motor vehicles, directors, E. S. Cameron, A. B. Emerson, H. P. Cameron.

Boston, Mass.—Puritan Motor Supply Co.; capital stock, $5,000; directors, J. G. McCormack, Jr., W. E. Hearn, R. W. Downing.

Boston, Mass.—Royal Blue Line Co.; capital stock, $100,000, to deal in motor cars; directors, W. F. Smith, C. H. Poole, C. F. Smith.

Boston, Mass.—Tyler Brothers Corp.; capital stock, $100,000, incorporators, F. J. Tyler, L. S. Tyler, J. M. Gibbs.

Brooklyn, N. Y.—Brooklyn Terminal Garage & Machine Co.; capital stock, $10,000, incorporators, D. B. Abbott, C. E. McMahon, J. D. Fackenthal.

Brooklyn, N. Y.—Haas Garage Co.; capital stock, $2,000; incorporators, L. Haas, E. Haas, Oscar Hauman.

Brooklyn, N. Y.—C. Storage Battery Co.; capital stock, $2,000; to manufacture storage batteries; incorporators, A. M. Friedenberg, R. W. Vicarey, L. Friedenberg.

Butte, Mont. Butte Automobile Co.; capital stock, $25,000; incorporators, W. G. Hansen, M. Hansen, A. C. Kremer.

Buffalo, N. Y. Niagara Devices Co.; capital stock, $100,000, to manufacture transmissions; directors, E. D. Matteson, G. A. Cotton, G. R. Volkmar.

Chicago Madia Auto Livery Co.; capital stock, $2,500, incorporators, S. J. Andalman, J. N. Landes, H. Stretton.

Cincinnati, O. Bond Hill Auto Service Co. capital stock, $20,000, to operate freight and passenger service, incorporators, J. Gies, J. F. Allers, J. B. Arlinghaus, A. H. Pohlman, W. A. Earls.

Cleveland, O. Automobile Electric Appliance Co. capital stock, $20,000, incorporators, P. S. Crampton, C. R. Brown, Jr., G. W. House, F. E. Fuss, H. Davis.

Cleveland, O. Auto Electric Appliance Co. capital stock, $20,000, to manufacture electric appliances, incorporators, P. T. Crampton, C. R. Brown, G. W. House, F. E. Fuss, H. Davis.

Cleveland, O.—Northern Ohio Automobile Co.; capital stock, $10,000; to conduct races; incorporators, R. H. Lee, F. Cawood, J. A. Alburn, H. E. Weffler, F. Hockley.

Detroit, Mich.—Motor Patents Co.; capital stock, $10,000; incorporators, J. W. Kyar, S. L. Depew, E. W. McGookin.

Detroit, Mich.—Traveler Motor Car Co.; capital stock, $15,000, incorporators, W. J. McIntyre, J. P. Lavigne, F. W. Barstow, W. L. Kenfield, W. W. McIntyre.

Fort Worth, Tex. Napatch Tire Filler Co.; capital stock, $110,000, to manufacture tire filling compound.

Grafton, W. Va.—Grafton Motor Co.; capital stock, $5,000; to repair, deal in and store motor cars; incorporators, H. J. Pracht, H. D. Comerford, J. Howard Reynolds, A. R. Huns, D. C. Peck.

Grand Rapids, Mich. Hand Corp.; capital stock, $30,000, to manufacture motor cars, incorporators, O. H. L. Wernicke, H. C. Cornelius, G. H. Hand, J. A. Whitworth, L. A. Cornelius, G. G. Whitworth.

Harrisburg, Pa.—Economy Tire & Rubber Co.; capital stock, $5,000; to manufacture and deal in rubber goods; incorporators, E. L. Craft, E. M. Knupp, B. F. Knupp.

Highland Park, N. Y. Walter Williamson Automobile Co.; capital stock, $10,000, to deal in motor cars; incorporators, W. M. Williamson, W. Whittlesey, V. J. Miller.

Kansas City, Mo. Swinehart Tire & Rubber Co.; capital stock, $10,000.

Kansas City, Mo. Transcontinental Tire Co.; capital stock, $10,000; to manufacture tires; incorporators, J. Chappelle, E. L. Thompson, C. H. Alexander.

Kingston, N. Y. Taxicab Transportation Co., capital stock, $7,000; incorporators, W. Hinterbrant, E. K. Hinterbrant, E. Hinterbrant.

Lynn, Mass.—V. C. Motor Truck Co.; capital stock, $100,000, directors, John M. Nelson, John P. Stevens, W. T. Langmaid, J. P. Cheever, C. N. Alley, S. D. Ritchie.

Marlington, W. Va.—Marlington Garage; capital stock, $10,000, incorporators, F. T. McVicker, C. A. Younger, M. E. Pue, G. B. Gestall, L. S. Shoemaker, G. W. Clark.

Montreal, Canada Canada Tire Filler Co., Ltd.; capital stock, $150,000.

Nashville, Tenn. Cumberland Motor Co., capital stock, $10,000; incorporators, W. D. Caldwell, J. H. Cheek, J. O. Cheek, Jr., D. M. Bayer.

New York—Englebert Tyre Co.; capital stock, $100,000, deal in tires; incorporators, S. K. Kellock, C. B. Campbell, E. W. Elverson.

New York—Amazon Rubber Smoking Machine Co.; capital stock, $5,000; incorporators, C. T. Green, E. B. Griffin, E. M. Morrison.

New York—Zilio Sales Co.; capital stock, $5,000, to deal in motor car accessories; incorporators, E. Moyse, F. H. Moyse, I. J. Phelps.

New York—Knickerbocker Havers Co.; capital stock, $50,000; incorporators, E. M. Cravath, E. M. Crosthwait.

New York—Simplex Carbureter Co.; capital stock, $150,000; incorporators, A. L. Kull, Colonel Upton, S. J. Meyer, M. Meyer, J. J. Welch, Thamm.

New York—Ames Automatic Shock Absorber Co.; capital stock, $25,000, incorporators, L. E. Bomeister, G. H. Edwards, G. Isaksen.

New York—Commercial Delivery Co.; capital stock, $500; to deal in delivery cars and trucks; incorporators, A. Miller, N. Tarakan, L. Tarakan.

New York—Imperial Auto Renting Co., capital stock, $1,000; incorporators, A. S. Gusson, D. Abraham, A. Miller.

Rochester, N. Y.—Automobile Safety Fender Co.; capital stock, $100,000, incorporators, W. A. Snyder, Jr., A. Dewolf.

Seattle, Wash.—Rambler Motor Car Co., capital stock, $5,000; incorporators, D. W. McNaughton, N. J. Moorehouse.

Seattle, Wash.—Miller Tire Co.; capital stock, $5,000, incorporators, W. M. Barr, J. S. McBride, G. J. Bonness.

Stillwater, Minn.—Republic Motor Co., capital stock, $10,000; to manufacture motor cars; incorporators, G. H. Sullivan, L. L. Manwaring, P. H. Guilford.

St. Joseph, Mich. Wizard Mfg. Co.; capital stock, $10,000, to manufacture carbureters; incorporators, F. A. Sharpneck, T. Robinson, G. C. McDowell.

Toledo, O. Landman-Griffith Co.; capital stock, $10,000; to deal in and repair motor cars; incorporators, C. P. Landman, C. K. Friedman, W. E. Griffith, H. Landman, G. D. Griffith.

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MOTOR AGE

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DEPARTMENTS

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MOTOR AGE

en's Verdict: "The Horse Must Go"

Chiefs Attending Convention in Denver Declare Preference for Motor-Driven Apparatus

By Darwin S. Hatch

DENVER, Colo., Sept. 21—"The day of the horse is past in fire department service." These were the words which greeted the visitor many times during the fortieth annual convention of the International Association of Fire Engineers which closed its week's session here yesterday. At least half of the speakers among the fire chiefs used the sentence and it was heard on every hand in the exhibition hall at the Auditorium when the visiting chiefs noticed that of the twenty pieces of fire fighting apparatus shown there was not one that was not motor driven.

That motors far exceeded horses in the points of speed, economy, and ability to get there under adverse weather conditions was the consensus of opinion of the heads of the fire departments gathered from every city of any importance in the United States, Canada, Panama, and the Philippines. According to them it will be a matter of only a few years until all fire departments will be completely motorized.

Motor-driven fire fighting equipment was the almost universal topic of discussion. Of the eleven papers read and discussed at the meetings of the association, five of them dealt with motor-driven equipment, and none was more thoroughly discussed or listened to with greater attention than those on the subject of motors in the fire department service.

Among the papers presented to the convention were papers on Tractors for Steam Fire Engines, Aerial Trucks and Water Towers read by Chief Kenlon, of the New York fire department and R. H. Bawker, chief of the department of Passaic, N. J.; Motor versus Horse-drawn Apparatus in Deep Snows, by Chief Smart, of Calgary, Can.; the Efficiency of the Motor Pumping Engine, by George W. Boothe, chief engineer of the National Board of Fire Underwriters; and the Triple Combination

TYPE OF MOTOR FIRE PUMP AND HOSE WAGON COMBINED. A DOUBLE-PISTON PUMP CARRIED IN FRONT OF RADIATOR

Hose Wagon, Chemical and Pumping Engine, by F. J. Connery, chief of the Newcastle, Pa., fire department.

Motors Now Almost Universal

A canvass of the 550 fire chiefs gathered at Denver showed that practically every municipality of 10,000 inhabitants and over had one or more pieces of motor-driven equipment, and in some towns, notably Savannah, Ga., horses had become an unknown factor in the fire department.

Very few cities are there in which the chief's wagon is not a motor car, and usually the complete motorization of the department is only a matter of time after the advantages of motors over horses are demonstrated to the satisfaction of all by the chief's own vehicle.

Discussion of the advantages of the motor car over the horse-drawn wagon for the use of the chief is hardly necessary. The foremost consideration is the speed with which it enables the head of the department to reach the scene of the fire, have its seriousness gauged, his campaign planned, and be ready to give the necessary orders by the time the apparatus arrives. This is assuming that the motorization of the department has proceeded no farther than the chief's wagon. Where there are other pieces of motorized apparatus, a motor car for the man in command is an absolute necessity, otherwise he would be lagging so far behind his motor apparatus that his usefulness as a field commander is seriously impaired. As to the actual speed, except on the very shortest runs, motorization of the chief's conveyance cuts in half the time required to reach the scene of battle. And this may be taken as generally true, that wherever the horse has been replaced by the motor in fire department service the length of time to reach the fire from the station under average conditions is just about one-half of the time required for a similar piece of apparatus drawn by the four-legged tractor.

What this means to a department at the early stages of fire when seconds mean thousands of dollars, or perhaps even human lives, needs no dilation in the columns of Motor Age.

This average figure of twice the speed for the motor apparatus to that obtained by horse-drawn equipment is only for runs of medium length. In very short runs there is slight advantage in the point of time for the motors, but when the length of run approaches ½ mile or more, the motors gain more noticeably. In the case of very long runs, the motors show the most superiority, for they can maintain any speed for the entire distance, whereas the horse driver must regulate his speed according to the distance. All in all, the advantage of the motor in the point of speed increases proportionately to the distance covered.

Illuminated Fire Parade

Very forcibly was this phase of the question presented to the chiefs at Denver on the evening of September 13, when an illuminated fire run was made. It concluded the major portion of the motor driven equipment on display at the Auditorium, as well as most of the horse and motor-driven equipment of the city of Denver. The run was less than 1 mile in length and the motorized equipment sped down the course with an ease that contrasted greatly with the efforts of the straining horses to close up the rapidly widening gap between them and their speedier gasoline and electric rivals. At the finish the motors seemed and were capable of going indefinitely farther at the same rate, but their four-footed followers pulled up panting and blowing, willing, but unable, to pull their heavy loads much farther.

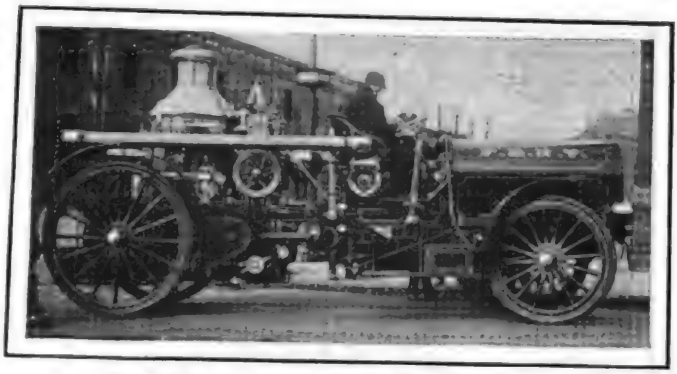
Under average conditions, of load, distance, streets and traffic, horse-drawn equipment can make from 10 to 15 miles per hour, while the motor-driven equipment under corresponding conditions, can average between 20 and 30 miles per hour.

It is when one considers the question of expense as a means of comparison between the two methods of propulsion of fire apparatus that the greatest divergence of opinion is encountered. Fire department

A DEMONSTRATION OF MOTOR FIRE APPARATUS

heads, when questioned on the subject, used almost identically the same words in nearly every instance—"There is no comparison."

All agreed that the motor was by far the cheaper to maintain. When pressed for relative costs, their figures varied greatly, but in nearly every case, the divergence was found to be due to one or both of two factors: differences in local conditions, such as the cost of feed, or quality of the streets; or to the length of time the motors upon which the figures were based had been in service. For instance, in the east, where the feed for horses is comparatively high, and the streets are better, the difference in the cost of maintenance of the two types of propulsion is greater than it is in the western states, where feed is cheaper.



MOTORIZED STEAMER PUMP IN NEW YORK DEPARTMENT

Comparative Cost Estimated

Figures for the cost of keeping a horse vary between $15 and $25 per month. Chief Kenlon, of New York, finds that the average cost to keep one horse 1 month in the fire department service of that city is approximately $20 per month. In this statement Chief Bawker, of Passaic, N. J., coincides, as do most of the others. Chief Kennedy, of Billings, Mont., finds that each horse costs him $17 per month, Chief Post, of Shelby, O., puts the figure at $19. San Francisco, St. Louis, Chicago, Los Angeles, Cleveland, Cincinnatti, Boston, Savannah, New Orleans, Montreal—in fact all of the larger cities expend very close to $20 a month for each of their horses, so this figure can be taken as a good average.

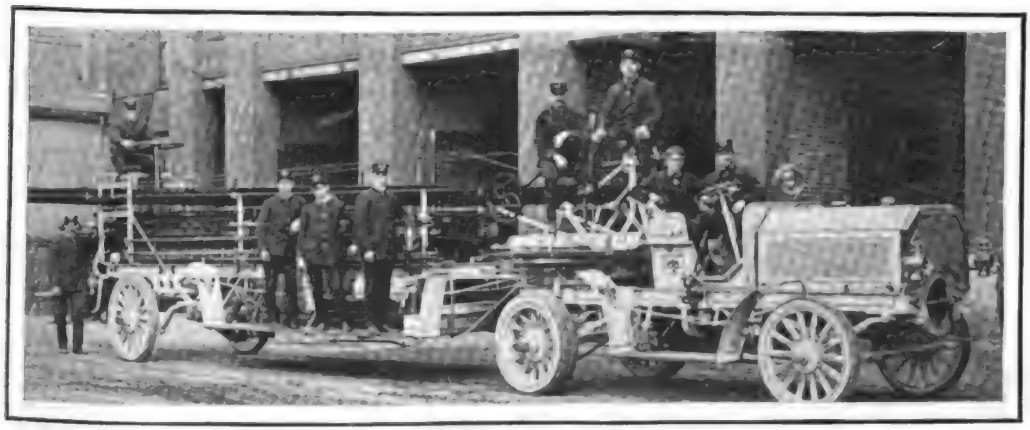
Cost of maintenance of motor apparatus shows a wide variation. A chemical and hose combination costs the city of Shelby, O., $2.60 per month for maintenance, including repairs, gasoline, oil, etc. The motor displaces two horses at $19 per month each or a total of $38 for the two. This represents a saving of $35.40 to the city per month, or over 90 per cent. T. F. Kennedy, chief of the Billings, Mont., department finds that a triple combination displacing three horses costs $10 per month. The horses cost $17 each, or $51 total per month, a saving through the motor of $41 dollars, or better than 80 per cent.

If we consider the cost of upkeep of motorized versus horse companies, instead of the individual pieces, we find an interesting comparison. Norfolk, Va., has both motor and horse companies. The comparison of the upkeep of one of each class of company according to R. T. McLaughlin, chief of the Norfolk department, showed $42 upkeep of the motor company for a period of 2½ months and for the horse company for the same 2½ months the cost was $196, or nearly five times as much. The motor company in this case consisted of one motor pump and one combination hose and chemical wagon. The equipment of the horse company consisted of a 4-horse steam pump and one 2-horse combination. In none of the instances referred to has the saving in wages of the men been considered.

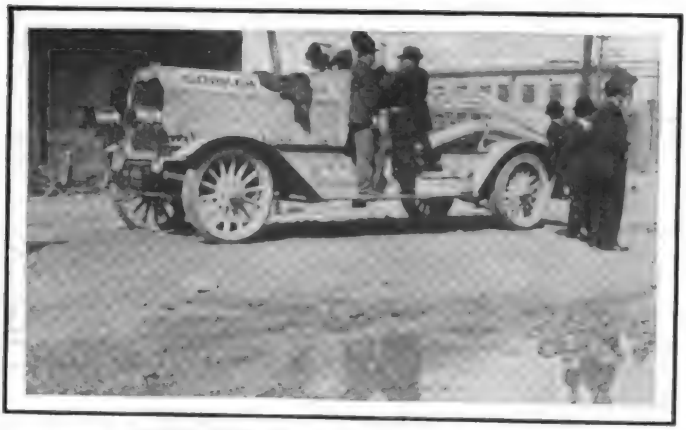
Savannah, Ga., a city of about 100,000 population, has effected a saving of $2,225.78 in 5 months by the use of its motor-driven equipment, according to Chief Ballantyne. This city is completely motorized. It has fourteen pieces, including two chief's cars. The pumps are all gasoline except three which are motorized steamers and are held as reserves. Chief Ballantyne states that the motor pumps save from three to four men, or rather make that many more available as fire fighters in each company. The driver need not stay with his horses and becomes available as the engineer on the pump, or an actual fire-fighter on the other pieces of apparatus. It is not that men are laid off or wages reduced by the introduction of the motor into the fire department service, but the companies and stations are strengthened by reducing the number of men actually needed to operate the apparatus so that they can be used for other purposes.

One Phase of Motorization

Very naturally, one of the first developments in the way of the motorization of fire departments was the actual substitu



AERIAL LADDER TRUCK DRIVEN AND OPERATED BY A MOTOR



A 1,000-GALLON MOTOR-DRIVEN THREE-STAGE TURBINE PUMP

tion of a gasoline tractor instead of the horses, hitching the tractor to the same machine as the horses had formerly pulled. This method of motorization has been very successful, particularly with such heavy pieces as steam pumps, aerial ladders and water towers. New York is perhaps the leader in this method of motorizing, although some other towns are employing it. Passaic, N. J., is one of these, and the chief of its fire department, R. H. Bawker, is authority for the statement that the cost of hauling the apparatus so equipped was one-tenth of the cost of hauling the same apparatus with horses.

Chief Bawker states two tractors were purchased at the beginning of the year 1910 for pulling the hook and ladders. One is a 90-horsepower tractor which pulls an aerial truck having a 75-foot extension ladder and weighs 10 tons; the other is an 80-horsepower tractor pulling an ordinary city-size truck. During the year ending May 30, 1912, the two tractors averaged a cost of $8.85 per month, against the cost of $190.10 per month for horses on the same apparatus. These figures include gasoline, oil, and repairs of every description to the tractors, and the figures for the horses include feeding and shoeing, repairs to harness and veterinary fees.

New York's Inclinations

New York leans to the use of the tractor-pulled steamer rather than to the true motor pump. Chief Kenulon's figures as to the economy of tractors in New York brought out a more comprehensive method of comparing the economy of the animal and mechanical propulsion. Kenlon believes that to arrive at the true basis, interest on the investment, depreciation, etc., should be considered along with the other costs. He assumes the life of a tractor in his department to be 12 years and the life of a horse to be 7 years. The interest at 4 per cent on an investment of $4,000 for a tractor is $160 and the depreciation in value amounts to $333. Similarly, the interest on the three horses at $350 each displaced by the tractor is $36.75 and their depreciation $150.

Of even more importance than economy is the question of reliability. Can motor apparatus be depended upon to be on the job when needed? The opinion seems to be very general among fire engineers that it can. So far as the tractors are concerned, there seems to be no doubt. Chief Kenlon states that during the 6 months ending August 19, a motor-drawn steam fire engine has answered upwards of 500 calls, and in no case has it failed to reach the fire, in most cases in better time than the horses. On the strength of this performance the city of New York has just let the contract for twenty-eight tractors. Sixty-one new companies are being organized fully motorized. Instead of stables the stations are garages.

In illustrating the dependability of the tractors in the Passaic service, Chief Bawker stated that during the 18 months in which they have been pulling the trucks, there has not been a time when the alarm has sounded that there has been trouble in starting, and when started the tractors have always arrived at and returned from the fire without trouble or delay. There are some very steep hills in the city of Passaic but the tractors make 8 miles an hour on the steepest of them.

In the winter season when snow and ice cover the streets, it does not interfere to any great extent with the operation of the tractors. In one instance, Chief Bawker states, it snowed continuously for 24 hours when an alarm was turned in from the hill section of the city. A speed of 15 miles an hour was made through streets unbroken by traffic. The best horses could have done under similar circumstances would have been 5 miles per hour.

With tractors doing so well it is to be expected that apparatus in which the motor is on the same truck would do as well or better in snow and ice, for in the latter type the weight is on the driving wheels, where it should be to give traction. Such is the case, as the experiences of the departments which have used them in snow will show.

Kansas City's Preference

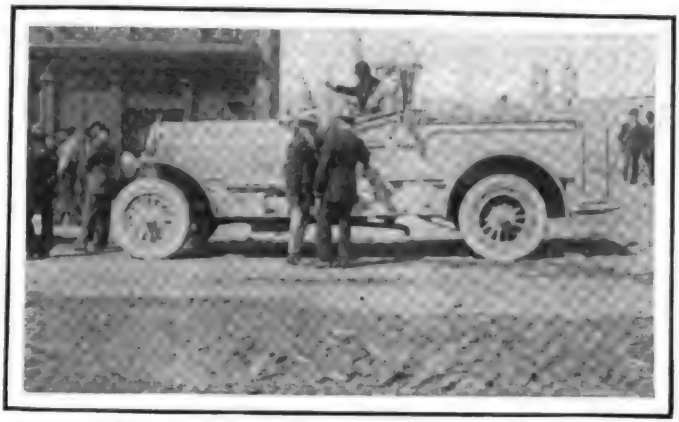
According to George C. Hale, fire and water commissioner of Kansas City, Mo., a motor-driven, three-way combination got to a fire and handled it through 26 inches of snow when all the horse-drawn equipment became irretrievably stuck. With chains on all four wheels and the load helping to give traction these motor-driven pieces can go through storms that horses cannot face.

For experiences in snow, most would imagine Calgary, Can., to be the city offering the most rigorous conditions, but James A. Smart, chief of Calgary's fire department, says that the snowfall is not great, but very dry and often drifts to a depth of 2 or 3 feet. He has had in use for the past three winters a 40-horsepower squad wagon and during that period never has been tied up, never failed to reach a fire under any weather conditions. He believes that motor-driven apparatus has the advantage over horse-drawn apparatus wherever the use of wheels is possible. Only in the use of runners has the horse-drawn apparatus the questionable advantage, for in severe storms horses will not face the average blizzard of the northwest, and the motor will. Under light, flaky snow, Chief Smart says, he has seen 75 per cent of the horses fail in attempting to reach a fire on asphalt pavement up a slight grade that the motors negotiated without difficulty. The Society for the Prevention of Cruelty to Animals never had a spasm at seeing a motor standing facing a blizzard.

There is not the unanimity of opinion in regard to the availibility of the gasoline motor as a pumping engine that there is as to its advantages as a propelling unit. Motor pumps as distinguished from steamers have not yet proven their entire reliability to the complete satisfaction of many fire engineers, who hold that though the gasoline engine is the best method of getting the pump to the fire, the steamer is the better for doing the pumping. One of the reasons advanced by the adherents of the steamer as a pump in conjunction with the motor as the propeller, is that it is asking too much of the gasoline engine in its present state of imperfection, to expect entire reliability for hours of steady work at top load after it has been pushed to get the pump there in the shortest possible time.

Looking After Motor Pumps

Adherents of the motor pump say that if the motor is looked after and operated by a competent man, and by that man alone, there need be no fear of premature exhaustion of the motor from overwork. In support of this contention, Chief Magee, of Dallas, Tex., who allows but one man to look after his motor pump and



ONE OF THE LATEST TYPES OF FIRE PUMPS CARRYING ITS OWN HOSE

permits no one else to lift the hood, mentions one long stretch of work which proved the reliability of the motor pump to his satisfaction. After getting the pump to the fire in record time the motor pumped water for three lines of hose for 17½ hours and for one line of hose for three hours longer. The operators of the Dallas motor pumps number three to each pump and work on three shifts. One of these is called the chief engineer and gets $10 more per month than do the other two drivers. He has complete charge of the motor and no one else is permitted to raise the hood.

The man must know his motor. As Chief Ballantyne puts it, "You can't put a figurehead up on the driver's seat and expect reliability." Motors are not fool-proof yet. The man must recognize knocks and not try to adjust the carbureter when the motor grunts from the cold water running through its jackets.

Ballantyne tells of a fire in the cotton storehouses along Savannah's waterfront. It was necessary to put seven motor pumps in hubdeep on new-made ground where horses never could go. With these he pumped twenty-one streams for 8¼ hours and three for 13 hours without the least sign of trouble. Each of the seven pumps ran at top speed continuously.

Objection Against Motor Pump

Another objection urged against the motor pump is the fact that with the present arrangements their exhaust gases cannot be used to thaw out frozen hydrants, as is done with live steam from the boiler of the steamer. In answer to this, those who uphold the motor pump say that when the proper hydrants are properly installed and looked after, they will not freeze. Nevertheless, hydrants do freeze, and some means must be provided to thaw them out. Chief Kenlon urges the use of electricity in the same way as it is employed on water pipes and even suggests that the motor pumps carry with them an arrangement of some sort for utilizing the power lines and lighting mains. Chief Ringer, of Minneapolis, states that alcohol in the quantity of about 1 pint thaws the hydrants in short time. Means for thawing hydrants with motor pumps is a question that the makers will have to solve.

There is another point in which motor pumps of some types, at least, are weak, although makers are waking up to the fact. As pointed out by George W. Booth, chief engineer of the committee on fire prevention of the National Board of Fire Underwriters, in his paper presented last week on the efficiency of the motor pumping engine, the chief reasons for the breakdown of motor pumps during service is the continued running at high speed. It is the opinion of all the engineers who have observed tests of motor pumping engines, that these machines should be provided with high powered motors, so that it will not be necessary to run them when the pumps are delivering their maximum capacity, at a speed greater than is safe and reasonable for the long continued service which they are often called upon to perform.

Booth believes that a reasonable and reliable speed will be not much in excess of 1,000 feet per minute piston travel as assumed in the A. L. A. M. formula. It was found that interruptions and breakdowns were most often due to running the motor high speed. There is a growing tendency among manufacturers of motor fire engines towards these high-powered motors, since they decrease the liability of heating or other engine troubles, and of vibration and consequent breaking of small parts.

Interesting Exhibits

So far as the exhibits of apparatus were concerned, most interest perhaps was created by the monster Gorham pump recently produced by the Seagrave Co., Columbus, O. It is a motor-driven multiple-stage centrifugal turbine-type pump and is made in two sizes. The larger has a normal capacity of 1,000 gallons per minute, and the smaller of 750 gallons per minute.

The apparatus consists of a heavy chassis carrying a six-cylinder gasoline engine of 7¾ inches bore and 9 inches stroke at the forward end with its shaft extending to the rear end, where it is connected to the rotor shaft of the turbine pump. The latter is mounted on ball bearings and

OFFICIAL TESTS OF MOTOR PUMPS AT DENVER

COMBINATION CHEMICAL AND HOSE WAGON ANSWERING ALARM

carries rotor wheels, on which are mounted the vanes or blades that revolve inside the outer casing. There are three of these rotor wheels or runners.

As this pump will take and deliver gravel the size of a walnut without chance of injury to itself, no precautions need be taken as to the water supply and the only moving parts inside the pump are the three runners and drive shaft. It is possible to shut off any or all leads of hose from the pump, either together or separately, without the use of relief valve or any danger of killing the engine. Connected to the pump is a water governor, which throttles the engine automatically, thus allowing the pump to meet with the varying conditions of fire service without material change in pump pressures. The motor is a T-head construction of the slow-speed type, rated by the A. L. A. M. standard formula at 144 horsepower. It delivers its maximum horsepower at 750 revolutions per minute. Ignition is by a Bosch two-spark system, thus exploding in each cylinder from two independent spark plugs at the same instant. There is a third set of spark plugs connected with the battery and Bosch coil for use in starting.

The motor is fitted with a self-starter. The oiling system is self-contained and provides for force-feed oiling to all cylinders and bearings. The frame is of 7-inch channel steel. Tires are solid, 40 by 5 inches in front and 40 by 4 inches dual in the rear. The wheelbase is 174 inches and the truck can carry seven men at a speed of 35 miles per hour. Either machine can be supplied with a body for carrying 1,000 to 2,000 feet of 2½-inch fire hose, if desired.

Another engine of large size is the Robinson Monarch. The engine is six-cylinder, 6¼-inch bore and 6¾-inch stroke; rating by A. L. A. M. rule 93.6 horsepower. The pump is reciprocating, three plunger, single-acting; 6-inch bore and 8-inch stroke and rated at 900 gallons per minute at 120 pounds net pump pressure and 500 gallons at 200 pounds pump pressure. One of the American-La France pumping engines was a six-cylinder, 7⅛-inch bore and 8-inch stroke; rating by A. L. A. M. rule 121.6 horsepower. The pump is of the rotary-gear type, rated at 900 gallons per minute at 120 pounds net pump pressure, and 600 gallons at 200 pounds pump pressure.

A large Webb engine was shown. This engine is six-cylinder, 6-inch bore and 7-inch stroke; rating by A. L. A. M. rule 86.4. Pump is of the rotary type, rated at 800 gallons per minute at 120 pounds net pump pressure. The Ahrens-Fox Continental engine is a six-cylinder, 5½-inch bore and 6½-inch stroke; rating by A. L. A. M. rule 72.6 horsepower. The pump is reciprocating, duplex, double-acting; 6½-inch bore and 4-inch stroke. Rated at 600 gallons per minute at 120 pounds net pump pressure, and 350 gallons at 200 pounds net pump pressure

Milwaukee Meet Postponed

Rain Puts Wauwatosa Course in Such Condition Vanderbilt, Grand Prix and Small-Car Races Cannot be Run—New Dates Chosen by the Brewers Are October 2, 3 and 5

MILWAUKEE, Wis., Sept. 23—No road races were run over the Wauwatosa course last week because of the horrible condition of the circuit that had been prepared for the Vanderbilt, Pabst, Wisconsin and grand prix events. Equinoctial rains made a sponge out of the roads and in consequence all four events have been postponed for 10 days, in order that the course may be put into condition for the classics. The new schedule calls for the running of the Vanderbilt on October 2, the small-car events on October 3 and the grand prix on October 5.

It was a most disappointing ending to what promised to be a glorious success. The stage had been set for the big races and had it not been for the rain there would have been no hitch. There had been a fine advance sale of tickets, the leading drivers and the fastest cars had been nominated and the motoring audience had settled back in anticipation of keen sport. But Thursday, the day before the meet was to open, it started to rain and the water came down so hard that it was impossible to have practice. That night it cleared off nicely and everything looked lovely. At 6 o'clock Friday morning there came a small cloudburst, which practically put the course out of condition.

Still the Milwaukeeans wanted to go ahead with the program and as it was not raining at the time scheduled for the decks to be cleared for action, it was determined to attempt the running of the small-car event a couple of hours later than the hour first selected. But just as the cars were lined up at the tape at 1:30 there came another shower. Referee Pardington inspected the course, then postponed the Pabst and Wisconsin to September 24. It was announced that an attempt would be made to run the Vanderbilt the next day, Saturday, it being anticipated that the weather would clear and give the roads a chance to dry out, so work could be done.

The next morning, however, the early birds discovered it was raining again. It was a mean sort of a drizzle and it looked as if it never would stop. It didn't take long for the referee to call off all bets and proceedings were stopped at 10 o'clock in the morning. Meetings were called for the afternoon to decide what to do—whether to try to race this week or postpone. First the dealers who are promoting the meet got together and decided to run the races even if they had to wait a month for fine weather. It was left to the drivers, however, to select the dates. The pilots wasted no time in their deliberations. They were all agreed to stick by Milwaukee to the finish and suggested the dates mentioned above, which choice was concurred in by the dealers' association.

The dealers then told the drivers that they would pay the expenses of the racing teams during the intermission. If any of the drivers wished to go home, then they would pay for the transportation. Everything was most harmonious and everyone expressed a willingness to work for the success of the meet.

A new plan of action was decided upon—to take in other interests outside of the Milwaukee Automobile Dealers' Association, which so far has carried the entire burden. Co-operation of others will be sought. The Milwaukee Automobile Club will be asked to help; so will the local chamber of commerce and other big organizations. By getting everyone helping it is anticipated the meet can be made a huge success, notwithstanding the postponement.

No time has been lost in getting to work on the course. If the weather remains as it is now—cool and sunny—there will be little difficulty experienced in making the circuit safe and fast. As it was last week, though, it would have been suicidal to have attempted to have run the meet. The affair was not postponed because of the rain itself, but because the course was not in condition to shed the rain that did come down. Had it been the Elgin or Santa Monica course the rain would have had no effect whatsoever on the circuit and it would have been possible to have run off the races despite the downpour.

Entries will be reopened, of course, and it is anticipated that there will be a few more nominations. It is expected that E. E. Hewlett will put in a fourth Fiat and there is a possibility that it will be driven by Howard Wilcox. Harry Stutz also desires representation in the grand prix and it is said he will make an entry in that event.

SUNBEAM TRAVELS FAST

London, Sept. 14—D. Resta, in a 30 horsepower six-cylinder Sunbeam, attacked the 1, 2, and 3-hour records at Brooklands last Monday, and, while he was stopped at 50 miles by a broken gasoline feed line, he managed to travel the half century in 32 minutes 16.4 seconds from a standing start, an average of 92.96 miles per hour, as against the 50-mile record of 91.32 miles per hour.

Cream City Backing Races

Milwaukee's Mayor Brings Business Interests Together and it Is Decided to Back Up Dealers in Promotion of Road Classics—Sunshine Puts Course in Shape—Practice Friday

MILWAUKEE, Wis., Sept. 25—The Milwaukee Automobile Dealers' Association has no further cause to fear that bugbear, financial loss, on the first running of the international road races at Milwaukee next week. Enough admissions and reserved seats were sold at the mayor's conference in the city hall on Tuesday afternoon at 4 o'clock to insure the financial success of the postponed cup races—and this means that the Vanderbilt cup, grand prix, Pabst and Wisconsin challenge races will be held in Milwaukee in 1913.

Of his own volition Mayor Gerard A. Bading called the conference "for the good of Milwaukee" in relation to the cup races. A committee consisting of the principal officers of all organizations interested in the progress and development of the city went into the matter with the mayor and before adjournment pledged enough seat purchases to make the outlook more rosy than it has ever been. The twenty-two members of the M. A. D. A. were present. All sympathy stuff was cut out and the watchword was support.

The wind-up of the booster campaign, by means of which Milwaukee will very easily take care of the financial part of the carnival, in case the outside world throws the city down, will be a monster stag at the Milwaukee Automobile Club on Monday evening, September 30.

Four days of sunshine and moderately warm weather have not only made that part of the course which was only slightly affected by the heavy rains wonderfully hard and smooth, but has helped the work of repairing washouts. Practice will begin all over again on Friday.

KLINEKARS WIN AT PITTSBURGH

Pittsburgh, Pa., Sept. 21—The Burman string performed here this afternoon at Brunots' Island track. Burman, in the Jumbo Benz, turned a mile in :51.98, cutting the Oldfield mark of :52.80. Horan, in the Cutting, plunged through the fence in the fourth event, caused by the dust which prevented him seeing the turn. Outside of these incidents the feature of the afternoon was the performance of the Klinekars, which won five of the races, which included two defeats of Burman in an Ohio. Summaries:

Five miles, 300 inches and under, non-stock—Raimey, Ohio, won; Kerr, Klinekar, second; Ringler, Mercer, third. Time, 5:02.82.

Five miles, 231-300 class, non-stock—Minker, Klinekar, won; Raimey, Ohio, second; Ringler, Mercer, third. Time, 4:58.06.

Five miles, 600 inches and under—Minker, Klinekar, won; Burman, Ohio, second.

Three miles, best two in three heats, free-for-all. First heat—Burman, Benz, won; Fetterman, Simplex, second; Ringler, Mercer, third. Time, 2:59.85. Second and final heat—Burman, won; Fetterman second; Ringler third. Time, 3:00.95.

Exhibition mile—Burman, Benz. Time, :51.98.

Three miles, free-for-all, Remy brassard—Kerr, Kline, won; Burman, Ohio, second; Shafer, Mercer, third.

Three miles, special event—Kerr, Klinekar, won; Shafer, Mercer, second; Minker, Klinekar, third. Time, 3:08.80.

Five miles, free-for-all, handicap—Kerr, Klinekar, won; Burman, Ohio, second; Raimey, Ohio, third.

NEW OIL CORPORATION

New York, Sept. 25—Financial interests back of the Mexican Petroleum Co. have announced that they are behind the organization of a new corporation with $35,000,000 capitalization, which will be known as the California Petroleum Corporation. The first object of the new company will be to acquire control of at least 80 per cent of the stock of the American Petroleum Co. and the American Oil Fields Co. This would give the new company 19,000 acres of land, about one-fifth of which is producing and which has been estimated to contain 295,000,000 barrels.

MILWAUKEE PLANT FOR KISSEL

Hartford, Wis., Sept. 25—The Kissel Motor Car Co. has acquired an additional plant at Milwaukee, securing 200,000 square feet of floor space. This means it will double the output. The general offices will move to Milwaukee. It is said the plant will be in the former Romadka trunk works.

FRENCH TALKING CAR TARIFF

New York, Sept. 25—Special telegram—Following the agitation in England about the invasion of the American small car, which has led to talk of the formation of a corporation with a capitalization of $25,000,000 to build lines to compete with the American motor cars, the French manufacturers are also becoming stirred up. The Frenchmen point out that their local market for cars listed at $1,000 is dead as the result of the American invasion. Both countries are to be protected from the dreaded American car by a tariff wall, if the wishes of the agitators are followed. The general opinion of American manufacturers is that no big competitive companies will be formed and that the preferential tariff talk will end in nothing.

Symptoms of panic which marked the British industry last week on account of the invasion of the British market by low-priced American cars, have subsided to a certain extent after a view of the situation from the standpoint of sober second-thought.

According to the cabled news from London nothing further has developed as regards the formation of a $25,000,000 corporation to make cars to sell at from $1,000 to $1,250, in competition with American lines of somewhat similar price. The idea, according to the distinguished speakers, including the Duke of Westminster and Lord Montagu, was that while the company probably could not equal the American cars of the same class on an even price footing, that the government might be prevailed upon to impose a preferential tariff against the American cars to cover the difference in price between the new British lines and the regular product of the American factories.

THOMAS RECEIVERS APPOINTED

Buffalo, N. Y., Sept. 23—Formal notification to the creditors of the E. R. Thomas Motor Car Co. has been issued that George C. Finley and Adolph Rebadow have been named receivers. A preliminary survey of the properties shows that while the nominal assets are in excess of the indicated liabilities, a severe shrinkage will be experienced in converting the assets into money. The liabilities are now estimated at $1,100,000.

CRUDE RUBBER EASIER

New York, Sept. 25—Special Telegram—Crude rubber was easier in the world's markets after the results of the first day's sales at the fortnightly auction in London were made known. The total offerings were 840 tons, and 292 tons changed hands at prices ranging from ½ to 1 cent lower on a basis of $1.16½ for pale crepe. Upriver fine sagged off to $1.12 in the New York market. Buyers are still holding aloof.

UNCLE SAM WANTS STANDARD CARS

Washington, D. C., Sept. 25—Special telegram—Specifications for a standard motor car for use throughout the government service will be issued in a few days by the general supply committee of the departments. The committee is working on these specifications and will have them ready for the trade probably within the next few days. These specifications do not contemplate the building of a purely governmental machine, but will provide a standard that must be met before purchases are made by the departments. It is the idea of the committee to embody many of the best features of standard makes of cars and to establish a rigid rule for the efficiency and lasting powers of parts.

GLIDDEN START POSTPONED

New York, Sept. 25—Special telegram On account of slowness in receiving entries for the national reliability tour of the American Automobile Association, the date of the start for the tour has been postponed until October 14, a week later than the original date. Announcement has been made by the A. A. A. that the reason for the slowness referred to is that many owners wished to compete with 1913 models and that deliveries of such have been slow.

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The Owner's Protection

THE car owner who has to have repair work done at an unknown garage or at some repairshop with which he has not previously had dealings cannot do better than give written instructions regarding the work to be done and demand a written reply covering an estimate of the work and the time it will require. Doing it in this way is simply good business practice, a practice that saves money, saves time and often saves the car to an amazing extent. It is only when you have given oral instructions over the telephone without a witness, and received oral replies over the telephone, also without a witness, and when you later find a bill for several hundred dollars where you imagined the cost would be $25, that you realize the necessity for caution in this respect.

UNFORTUNATELY there are many garagemen and many repairmen with incompetent help, who are prone to overestimate the amount of work that must be done in overhauling a car, and who have the faculty of taking off the body to change the carbureter or scrape the breaker points on the magneto breaker box. From all parts of the country come complaints of similar apparently unjust treatment of unscrupulous garagemen—garagemen who in not a few cases should be prohibited from conducting businesses because of the absolute lack of dependence that can be placed on their words and on their work. So glaring have these abuses become in certain parts of the country that clubs and trade associations have taken up the matter and have started a commendable movement of reform among the more hopeless section of them. There is room for much more to be done.

THE car owner needs more protection against the incompetent garageman and repairman. He specially needs protection against inadequate repair work. Not infrequently a car of one make has developed certain troubles, the owner cannot diagnose them, and leaves the situation in the hands of the garageman or the repairman. The latter takes advantage of the owner's ignorance or perhaps is equally incompetent to do the work or diagnose the trouble. In the end the owner pays for it in dollars and cents. He pays for a large repair bill and often his car is returned to him in an untuned or mechanically upset condition. The repairman has been an amateur of the amateurs. He has been a novice who had not any right to be permitted to experiment upon the car.

THE solution of this grievance rests with the car makers and with the motoring organizations. In England the matter has been largely settled by the Automobile Association and the Royal Automobile Club, which organizations issue certificates of qualification to repair shops and garages and furnish them with official cards which can be hung on the wall or mounted in other official and conspicuous positions. These cards certify to the general status of the garage and have riders which apply in particular to the repair force. If the National Association of Automobile Manufacturers, the Automobile Board of Trade or some national dealers' or garagemen's organization would take hold of a matter of this nature and demand competency of repair help, it would be one of the most savory factors that could possibly enter the garage and repairshop field. It would bring more business to the competent repair department and the adequate garage repair department and it would be cheaper to the car owner and more satisfactory to the car maker.

THE attaining of adequate repair work throughout the country can further be assisted by car makers issuing to all garages special instruction books showing the correct methods of dismounting car parts and also outlining what parts its is necessary to remove in order to dismount a certain portion, as well as noting what parts it is not necessary to remove before doing such a work. Repair bills can be produced to show vast amount of time charged up as labor for removing car parts that never should have been removed in order to repair the necessary break. This is where the car owner is taxed for the ignorance of the garageman, his help or the repairman and his help.

IT is of interest to the car maker to protect his owners. He can do it by working to get some method of controlling the working forces throughout the garages and repairshops of the country; he can aid by instruction books on dismounting of car parts; he can help by instruction books on treatment necessary for different metals; and he can do it in a score of other ways. Those makers who have erected service buildings are doing a wonderful good to those owners in their locality, but it is of little benefit to the owners in sections not within the zone of the service building. There is not any reason why the maker cannot extend his influence to this uncovered field. The need is great.

Motor Fire-Fighting Apparatus

TO a certain extent the rapid advance in the use of motors for fire department apparatus has been due to the inherent advantages of the motor as a source of power rather than to the farsightedness with which it has been applied by the makers. The manufacturers of motor-driven equipment for fire department service have not always followed the wisest course in the selection and arrangement of the component parts of the apparatus. Motors, chassis and frames originally designed for commercial truck service and often for pleasure cars have been adapted as far as possible to carrying the various pieces of equipment in fire service—in many cases seemingly without sufficient thought as to the wide difference in conditions of service and requirements in the fire department field and that for which the units were originally designed. The fact that it has only been with the past year or so that motors have become generally adopted as a means of propulsion in this service has been due, no doubt, to the fact that early designs of trucks for fire departments were produced without sufficient knowledge of the service to be required of them.

MOTORS for operating fire pumps must be capable of continuous service for hours at a stretch. The chief difficulty found with this class of equipment at the present time is that the motors as a rule are designed for delivering their normal power at too high crankshaft speed. Slow-speed motors show longer life, greater dependability and more continuous service than do high-speed motors. This fault is one which may perhaps be laid to too little consideration of the differences between the pleasure car and fire department requirements.

Indianapolis Announces a 2-Day Meet

Annual 500-Mile Race Will be Limited to 450-Inches and Under Cars

INDIANAPOLIS, Ind., Sept. 25—C. W. Sedwick, manager of the Indianapolis speedway, announces a 2-day meet will be held May 30 and 31. There will be a long race the first day, in all probability 500 miles, with a card of shorter races the second day. For the long race the piston displacement will be fixed at a maximum of 450 cubic inches and the minimum weight at 1,600 pounds.

Entries will open January 1 and close May 1, and the entry fee for the long race will be $500. The purse has not been determined. The second day probably will include the Wheeler & Schebler trophy, the Prest-O-Lite trophy or the Remy brassard. For the long race cars must attain a minimum of 75 miles per hour.

JOE DAWSON REINSTATED

New York, Sept. 25—Special telegram—At the September meeting of the contest board of the American Automobile Association yesterday Joe Dawson, winner of the 500-mile Indianapolis speedway race, who was automatically disqualified as a registered driver for giving an exhibition at an unsanctioned meet at Memphis July 4, was reinstated to take effect at once, as was his manager, C. E. Shuart. Fred Radina, a Cino driver, also was reinstated.

Applications for reinstatement from the Schact Motor Car Co. of Hugh B. Andrews and T. S. Duby were rejected. The Cleveland agency of the Stutz was disqualified until January 1, 1913, for advertising the Stutz performance at Elgin as a stock car, when these races were non-stock. The records of Spencer Wishart in the 200-mile race at Columbus were accepted; the recent Brighton Beach and Cleveland records were also accepted by the board.

Coming Motor Events

September 25-October 6—Agricultural Exhibition and Plowing Matches, Bourges.
September 30-October 5—American Road Congress; Atlantic City.
September—Track meet; Universal Exposition Co., St. Louis, Mo.
September 25-October 6—Agricultural exhibition and plowing matches, Bourges.
*October 2—Vanderbilt road race; Milwaukee, Wis.
*October 3—Wisconsin challenge and Pabst Trophy races; Milwaukee, Wis.
October 4-5—Track meet; Sioux City Auto Club, Sioux City, Iowa.
October 5—Grand prix; Milwaukee, Wis.
October 5—Fifth annual run of St. Louis Automobile Club; St. Louis, Mo.
October 6—Gallion hill climb.
October 7—Start of Iowa State Automobile Association's reliability.
October 8—National convention of Electric Vehicle Association of America; Boston Mass.
October 12—Track meet; Rockingham park, Salem, N. H.
*October 14—National tour Detroit to New Orleans; American Automobile Association.
October 21—Chicago Motor Club reliability.
October 26—Los Angeles to Phoenix Road Race.
November 2-3—Splash guard competition; Versailles.
November 6—Track meet; Shreveport Automobile Club, Shreveport, La.

*Sanctioned by A. A. A.

SHOWS.

September 23-Oct. 3—Rubber show, Grand Central palace, New York.
September 26-Oct. 6—Exposition agricultural motor cars, Bourges, France.
October 2-12—Fire show, Madison Square Garden, New York.
October 7-12—St. Louis show.
November 8-16—Olympic show; overflow
November 22-30 Agricultural Hall.
December 7-22—Paris salon.
January 6-11, 1913—Cleveland show.
January 4-11—Montreal show.
January 11-18—New York pleasure car show; Automobile Board of Trade; Madison Square Garden and Grand Central Palace.
January 11-22—Brussels, Belgium, show, Centenary Palace.
January 20-25—New York truck show; Automobile Board of Trade; Grand Central Palace and Madison Square Garden.
January 20-25—Philadelphia show.
January 25-February 1—Montreal, Canada, show.
January 27-February 1—Detroit show.
February 1-March 1—Pleasure car and truck show, Cincinnati, O.
February 1-8—Chicago show.
February 10-15—Chicago Truck show.
February 10-15—Minneapolis show.
February 17-22—Kansas City show.
February 24-March 1—Show at Omaha, Neb.
March 3-8—Pittsburgh show.
March 8-15—Boston pleasure car show.
March 17-22—Buffalo show.
March 19-29—Boston truck show.
March 24-29—Indianapolis show.

Antecedents of Words Now Part of Motor Phraseology

Trail-Blazers Encounter Adventures

CHICAGO PATHFINDERS ON STRETCH FROM CHICAGO TO ESCANABA, MICH.

Chicagoans, Lost in Woods, Hear Wolves and Bears —Battle With Sand

CHICAGO, Sept. 25—The sensational reliability run of the Chicago Motor Club, which proposes to encircle Lake Michigan, starting October 21 is attracting the attention of the western motoring public because of the boldness of the enterprise and the difficulties that are being encountered by the pathfinding Velie which is out under the direction of John G. De Long. The car has been out 11 days now and last night it was reported at Traverse City, Mich. It ought to reach Chicago to-morrow. De Long and his party were held up at a little town called Garden, Mich., awaiting new parts, pinions on the differential gear being broken in a battle with sand caused by getting off the regular trail

At this particular point it is almost wild country, the road winding through picturesque woods. The going is none too good but still negotiable, while the country penetrated abounds in wild animals. The pathfinders had a thrilling time of it. After getting out of the sand pocket it was necessary to abandon the car and walk 10 miles through darkness. They lost the way and laid down to sleep in the woods. A rain awoke them and they resumed their journey, finally finding a logger's cabin where they slept the rest of the night. On their tramp they heard bears and wolves in the underbrush and it was necessary to fire their guns to scare away the animals.

While all this may sound terrifying to would-be contestants, it is pointed out that the adventure will be well worth the while. It is anticipated there will not be more than 2 days hard going, that from Escanaba to St. Ignace. It is a country that should be alive to motoring following the reliability. At any rate makers are showing a keen interest in the affair and already there are nominated two Velies, two Stutzes, a Chalmers, Falcar, and Detroiter, while promises have been had from the Moline, Staver, Cino, R. C. H., Herreshoff, Hupmobile, Flanders, Studebaker, Kisselkar, Case, Cole, and others which ought to produce a field of at least thirty starters. The two Cadillacs from the Northwestern Military and Naval Academy that went through the 1910 Glidden have been promised. They will be equipped with wireless apparatus. In addition there are half a dozen private owners with Cadillacs, Mitchells, Nationals and Midlands who have promised to go in this most strenuous run. It is figured that this not only will be a reliability run, but an opportunity for an adventurous outing for those motorists who have not yet had their vacations. There is a special prize up for owners.

AROUND LAKE MICHIGAN ROUTE

LONG ISLAND CARDS RELIABILITY

New York, Sept. 23—As a test of reliable service the Long Island Automobile Club will conduct a century run October 5. Under the conditions the contesting cars must make five control points without allowing more than 15 seconds tolerance at any of the checking stations. They are approximately 20 miles apart, and the whole course is exactly 100 miles. The aggregate running time for the 100 miles is 5 hours, or an average of 20 miles an hour. The course is from the old Pettit hotel, Jamaica, to the Mansion house, Roslyn, Grand Central hotel, Hempstead, Creed avenue and Hempstead turnpike, and back to the starting point at Jamaica. The prize is a tire of any make desired by the winner. The start will be at noon

OHIOANS IN BIG SOCIABILITY

Cincinnati, O., Sept. 23—The first sociability tour of any proportions to be run out of Cincinnati took place Saturday under the auspices of the Commercial Tribune. The distance was 104 miles, and 175 cars and more than 800 people took part. The start was made from the Tribune office on Walnut street, near Fifth avenue, at 9 o'clock. Long before that time a large assemblage had congregated.

The route lay from Cincinnati to the Dayton Automobile Club and return. The participants were royally entertained upon reaching the Gem City. A big dinner was served at Hills and Dales, and there was general speechmaking.

The prizes were awarded to those drivers making the best average time. The average time for gasoline cars was 6 hours

14 minutes. A notable feature of the run was the showing of the electrics. There were many women drivers and all handled their cars in surprising manner. One hundred and twenty-five of the entrants completed the full journey. Miss Helen Schmidt took the first prize in the electric class. The average time for the electrics was 8 hours 25 minutes. J. D. Bruner took down first prize in the gasoline class. For some reason the officials decided not to give out the names of the cars. The number of cars disqualified for running either too fast or too slow and failing to come within the prescribed limits of 5½ hours minimum running time for the round trip and 7 hours maximum time, was ten.

A. A. A. RELIABILITY RUN TROPHY

SYRACUSE HAS BIG RUN

Syracuse, N. Y., Sept. 21—One hundred ten cars, conveyed by a bevy of motor cycles, today took part in the fourth annual sociability run for the silver trophy cup offered by the Syracuse Herald. The small number of machines that turned out for the Watson cup run of the Automobile Club of Syracuse this summer had led some to believe that public interest in runs was waning. However, today's fine showing proves two things: First, that motorists hereabout prefer the shorter runs; and, second, that ideal weather and road conditions will bring them out. The list of prize winners, in their order, with times, follows:

MEN'S DIVISION

Driver and car	Time
C. B. Shaw, Buick	3:48:22
A. J. Conine, Buick	3:49:21
Darius Smith, Abbott-Detroit	3:49:40
S. L. Devendorf, Ford	3:47:15
A. C. Ferguson, Cadillac	3:47:12
J. J. Stark, Regal	3:47:11
A. F. Clasen, Moyer	3:47:00
Harry M. Morrell, Maxwell	3:50:30
C. J. Travers, Regal	3:51:00
August Sakauske, Buick	3:51:09

WOMEN'S DIVISION

Pearl Cheshire, Ford	3:47:38
Mrs. H. W. Link, Hudson	3:50:13
Mrs. J. S. Brown, Empire	3:47:15
Mrs. W. H. Carr, Regal	3:47:15
Pauline Single, Ford	3:54:04
Mrs. K. Woodard, Case	3:36:10
Miss Marguerite Walliser, Overland	3:32:30
Mrs. G. W. Stark, Regal	4:03:35

Mr. Shaw's Buick, the winner, has the distinction of coming in within 23 seconds of the official time designated, this being 3:48:45, and known only to Mayor Edward Schoeneck. For this run of 60 odd miles, over beautiful country southwest of Syracuse the secret time had been based generally upon both state and local speeding laws, and the times made showed that motorists had been studying these to a great extent.

Never has a Syracuse run been attended by so favorable weather and road conditions. Most of the route, through a sightly hill and lake country, was over new state roads, and the liberal use of oil, combined with recent rains to render the usual dust problem negligible. It is an odd coincidence that two men named Shaw—not related—have been winners of the Herald annual run. Percival G. Shaw won in 1911. Miss Marguerite Walliser, in an Overland, is for the third time in the list of prize winners in this run.

Seventy-Four in Lu Lu's Run

BIG EASTERN AFFAIR

Atlantic City, N. J., Sept. 21—Car No. 2, a Cadillac, Charles L. Martin driver; No. 36, Pullman, C. Edward Firth; No. 25, Reo, David Cram, and No. 74, American, J. E. Mountain, captured the four prizes awarded the four contestants finishing nearest a secret time schedule in the second annual sociability run of the Lu Lu Temple Automobile Club from Philadelphia to the Hotel Strand, Atlantic City, today, seventy-four cars participating.

The official time designated for the 61 miles was 3 hours 13 minutes 30 seconds, and that the competition was keen is indicated by the fact that all four winners finished 2 minutes or less from the mark.

The weather was a trifle too cool for comfort, necessitating the wearing of heavy wraps, but the South Jersey constables made it warm enough for many contestants before they arrived at their destination. Alleged violations of the speed laws were numerous and in every instance those halted were not allowed to proceed until the stipulated fine was paid, the petty holdups interfering with participants' chances for prizes.

FINE ROAD AROUND BAY DE NOC, MICH.

CHICAGO PATHFINDERS CAUGHT IN SAND POCKET

Rubber Show an Educational Exhibit

VIEW IN RUBBER EXPOSITION IN GRAND CENTRAL PALACE

Grand Central Palace, New York, Filled with Exhibits Made by Big Industry

NEW YORK, Sept. 23—Crude rubber, rubber machinery used in production and preparation for market and in shaping the substance under various manufacturing processes, and the finished manufactured products, based upon rubber, are shown with a wealth of detail at the third international rubber exposition which opened at the Grand Central palace today.

The exposition will continue until October 3, and during that period the men connected with the industry, shippers, manufacturers and growers, will hold a convention similar to those of 1908 and 1911 in London.

Three floors of the big building are used for the show, the main floor being devoted to machinery, second to manufacturing processes, reclaiming, chemicals, etc., and the upper floor contains a very complete display of crude rubber.

There are twenty-two countries or states represented in the crude rubber show, the largest display being made by Brazil, which has an exhibition space of 10,000 square feet. All the Brazilian states in the Amazon valley are represented with complete displays of crude wild rubber and a small representation of the cultivated product. Among the other countries showing wild rubber are the African colonies of various European countries, Mexico, Central America, and some parts of the East Indies. The plantations are represented mostly in the displays of Ceylon, Malaya and the east.

Synthetic rubber has a part in the show, but from the commercial viewpoint it is not important at this stage of development. Such samples as are shown are said to equal the natural product in quality and service, but are eliminated from consideration by the cost of manufacture.

On the third floor there are exhibits of crude rubber aggregating not far from 150 tons and worth approximately $350,000 in the market. The Brazilian exhibits weigh about 90 tons and include all the commercial grades in six different varieties. All told, the different kinds of rubber shown in the Brazilian space number over thirty-five. The production of Brazil is about 40,000 tons a year.

Next in size to Brazil is the display of Malaya, which includes the Straits settlements and Malay states under British protectorate on the Malay peninsula along the straits of Malacca. This display is almost wholly of high grade plantation rubber, ranging from pale crepe, which is not smoked at all, to smoked block rubber, which is about as dark as the wild Brazilian product. The Malayan production is not far from 15,000 tons.

Ceylon comes next in size and importance from the viewpoint of the motor industry, its annual production being around 5,000 tons at the present rate. Other countries have exhibits, particularly the Philippine and Hawaiian islands, but, aside from Brazil, Malaya and Ceylon, they are not of the first importance to the motor car business.

It has been conservatively pointed out that the world's production of rubber in 1912 will be about 90,000 long tons, and that the motor industry will account for 31,000 long tons.

Production is increasing steadily, but not rapidly in Brazil, and is racing in the plantations of the mid-east. It is estimated that the total yield of the plantations in 1915 will equal that of the indigenous product.

The United States Rubber Co. has one of the largest show spaces in the building. A full line of its product is displayed, and an interesting announcement has just been made by President Samuel P. Colt that the company has nearly finished the planting of 25,000 acres in the island of Sumatra. Reckoning this plantation at 200 trees to the acre and the eventual yield at 50 pounds of dry rubber per tree, the supply of rubber for this company will some time reach the enormous amount of 50,000,000 pounds a year. Such a result is still far in the future, as the oldest of the trees on the plantation is now only 18 months. Trees begin to bear after their fourth year, and the production is small until they are 12 years old or more. The life of the rubber tree has not been determined so far as the plantations are concerned. The oldest trees in the Ceylon plantations are about 36 years old, and all others are younger. The veterans are producing more rubber per tree than any of the others, and so far have shown few symptoms of age.

The exposition was preceeded by a formal luncheon on Sunday, at which Henry C. Pearson, vice-president of the convention, acted as toastmaster. It was attended by most of the dignitaries present as representatives of the rubber countries, and the speeches promised much interest in the convention of the industry. Mayor William J. Gaynor opened the show this noon.

SALESMEN'S RALLY IMPORTANT

New York, Sept. 23—The sales managers' convention, which will be held under the auspices of the Automobile Board of Trade September 30 and October 1, probably will attract a large attendance, and preparations for a representative gathering are being made by the committee in charge.

The program of the meeting will embrace a wide field of observation. Among the subjects that will be treated by the convention are the following: Freight, shipping, motor car equipment, inclosed bodies, selling and advertising, and annual models. As a whole volume might be presented on any one of these subjects the chances are that the proceedings will be filled with interest.

The committee in charge of the affair includes the following: H. O. Smith, E. C. Howard, W. E. Metzger, C. W. Churchill, W. T. White.

Diagrams for New York Show Issued

Automobile Board of Trade Fires First Gun of Its Publicity Campaign

NEW YORK, Sept. 23—Application blanks and diagrams of the floor space for the two buildings in which the national show will be held January 11 to 25, have been issued, and the requests for space have been coming in at such a rate as to indicate that the show for next winter will be the greatest yet held in the city of New York.

As with the affairs of the past 2 years, the forthcoming exhibition will be one show, held in two buildings, the Grand Central palace and the Madison Square garden. The dates this year are from January 11 to 18, which will be known as the part 1 period, and in which pleasure cars will be shown, and from January 20 to 25, the part 2 period, when commercial vehicles will be exhibited. Accessories will be shown both weeks of the big exhibition.

The preliminary preparations to be attended to have proven so gigantic, that the show committee has been working on the plans since early spring. A plan of decoration for both buildings has been worked out that is expected to improve the appearance of even the palace.

The number of applications that have been received for space in the Grand Central palace indicates that the building will be completely filled with exhibits, as will the garden. Merle L. Downs, secretary of the show committee of the Automobile Board of Trade, 7 East Forty-second street, New York, has increased his staff in order to meet the demand for information and applications.

There will be four floors of exhibits at the Madison Square garden; pleasure cars being shown the first week on the main floor, and on the elevated platform, and tires, parts and accessories on the elevated plaform, in the basement, and on the balcony. Commercial vehicles will be shown only during the second week on the main floor and elevated platform.

Three floors will be devoted to the show at the palace, pleasure cars being shown on the main and mezzanine floors, during the first week of the show, motorcycles on the mezzanine and balcony floors, both weeks, and accessories, tires and parts, on the mezzanine and balcony floors, both weeks. Commercial vehicles will be shown at the palace on the main and mezzanine floors, during the second week.

The exhibits will be admitted for installation on Friday, January 10, and the show will be open to the public from 8 to 11 p. m. on the 11th, and from 10 a. m. to 11 p. m., on every succeeding day thereafter until Saturday, the 18th. These exhibits will be removed between the hours of 11 p. m. Saturday night, the 18th, until 1 a. m., the next morning.

At 7 a. m. Sunday morning the exhibits will be admitted for the second part of the show, and the second part of the show will open at 8 p. m. to 11 p. m. Monday evening, and from 10 a. m., on each day thereafter, until the end of the show.

Admission badges will be furnished each dealer, and signed invitation tickets may be purchased by the dealer for 50 cents each, on which payment is not due until presented at the door. General admission will be 50 cents for every day except Tuesday, the 14th, and Thursday, the 16th, when the charge will be $1.

The usual rules in regard to gasoline or other fuels, smoking, insurance and liability obtain. Special rules, are made prohibiting the use of lighted lamps, unless their light is cast upon the wall, or on an object within 3 feet of the lamps, so that it will not shine upon any person. No advertising souvenirs may be distributed, and no signs, such as price cards, sold notices, no pictures will be permitted in the exhibits, and only such literature may be distributed, as may pass the judgment of the show committee. No operable horn will be permitted, and no illumination other than that furnished or approved by the committee will be allowed.

Space on the main floor of the garden will cost $2 per square foot, on the elevated platform, $1.75, balcony, room 7 and concert hall, $1.55, basement, $1.50, tier boxes, $60 to $80 each. In the palace the main floor sells at $1.50 per square foot, while the mezzanine floor and balcony are listed at $1.25 each.

THIRTY TONS OF RUBBER IN NEW YORK EXPOSITION

DYER AND P. & S. AT PEACE

New York, Sept. 23—Licenses under two groups of Dyer patents have been granted to the Palmer & Singer Mfg. Co. and, the long litigation between the Enterprise Automobile Co. and the defendant concern will be abandoned.

The patents involved in the license rights are, first, the two covered by the settlement recently made between the Enterprise company and the Automobile board of Trade, by which the A. B. of T. was given the right to recommend the issuance of seventy-five licenses to its members, on payment of a lump sum to the assignees of the patents. These patents cover the selective type of gear-change mechanism with direct drive in use generally. The other patent is one of the group of five originally sold to the Patents Holding Co., in the days of the Association of Licensed Automobile Manufacturers, and which were re-conveyed to the Enterprise company as part consideration for the license rights granted to the A. B. of T.

It is understood that the royalty rate is to be one-tenth of 1 per cent on each of the three patents, thus making the aggregate royalty paid $3 on each $1,000, based on the retail list price. The Enterprise company has been inactive in prosecuting individuals since the settlement was made.

The suits against the defendants are docketed in the United States district courts for the southern and eastern districts of New York, and will be expunged from the records shortly.

Paris Issues New Traffic Regulations

PARIS, Sept. 15—Paris has just adopted a new set of traffic rules containing many features worth noting by American municipalities. Cities of Europe have many special traffic problems of their own. Built originally to fit the conditions of the times, the old sections of these old world cities are generaly a mix-up of narrow streets, with narrow sidewalks and crowded traffic. In many places traffic is only allowed in these streets in one direction, returning traffic using another street. Vehicles must keep moving at a trot at all times in some of these narrow thoroughfares to handle the number of vehicles seeking to pass through with any success.

The mixture of vehicles is worse than in America. There are single-horse rigs with two and four wheels, two-horse outfits the same, and many three-horse wagons. Passenger buses are frequently of two or three-horse equipment, though these are fast giving way to motor buses even in Paris. London and Berlin have adopted the motor almost exclusively.

Push carts are common, and motor trucks gaining in number, while pedestrians swarm everywhere. Paris is especially careful in the handling of foot traffic. Vehicles in Paris cannot back to the curb, but always must face parallel with the street.

Warning horns or signals are not allowed to be used except for their purpose. It is forbidden to use them for a waiting signal.

Vehicles are not allowed on the road that are so built as to hinder a clear view of the driver to the side and to the rear. Drivers are not allowed to crack their whips.

Pedestrians are required to take the right hand sidewalks on narrow streets. The complete traffic code as translated follows:

OBEDIENCE

1—Street car conductors, motormen, engineers, coachmen, chauffeurs, cyclists, etc., will pay obedience under any and all circumstances to the signals given by policemen, whether by word or by hand, in everything that relates to the approach or start from any place whatsoever, the taking on or letting off of passengers, loading or unloading of goods, etc.

2—Ignorance of these rules will not be accepted as an excuse for non-compliance. Every street car conductor, motorman, engineer, coachman, chauffeur, cyclist, etc., is required to follow these instructions, to avoid blockades, facilitate traffic, prevent loss of time and money, etc.

The police are ordered to enforce the observance of these rules.

SECTION 1. WHEN PASSING, TURNING, CROSSING AND STOPPING, KEEP TO THE RIGHT

1—Every vehicle, excepting when overtaking another, must approach the sidewalk on the right. But in streets with narrow sidewalks, the vehicle must not come quite close to the sidewalk, so as not to trouble the users of the sidewalk. When necessary, drive only as fast as a walk.

2—Every vehicle that meets another which comes from the opposite side must pass it on the right.

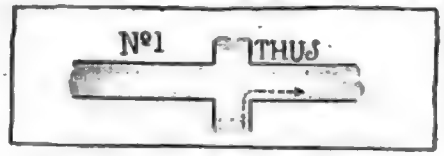
3—Every vehicle must pass to the left of those that go in the same direction and is not allowed to come back to the right until it has overtaken them completely.

French Metropolis Frames Up Ideas Worth Copying in America

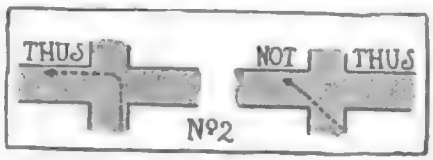
4—When a public road is divided lengthwise by viaducts, depressions, islands, platforms, etc., the vehicle will pass on the right; still, exceptions may be authorized.

5—Every vehicle that turns must keep to its right.

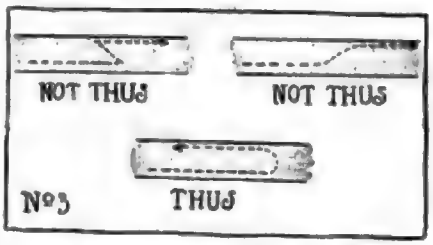
To turn to the right: See sketch marked 1.



To turn to the left: See sketch marked 2.



6—Every vehicle that passes from one side of the road to the other will go thus: See sketch marked 3.



7—Squares and crossing having an island for pedestrians in the center. In general on all squares in whose center is an island, place of refuge, public monument, etc., carriages must cross by keeping to the right and thus passing around the island or monument.

8—Traffic of carriages in the Avenue des Champs-Elysées. The central part of the Champs-Elysée boulevard, that is included between islands, is exclusively reserved for motor cars and motor vehicles; horse-pulled carriages, cycles, tandems, etc., must keep to the right on that part of the boulevard which is between the islands and the sidewalks.

9—When a vehicle stops, it must do it in such a way as to have the sidewalk at its right, except on the roads where the traffic is ordered to go along in one exclusive direction.

10—No vehicle is allowed to lean back against the sidewalk. It always must stand parallel with the street.

11—No vehicle, unless it be in a case unlooked for, or at least unless it be to let another vehicle or pedestrians overtake it, will stop on the public road, otherwise than near the sidewalk on the right and in such a way as not to trouble the pedestrians. Buses and motor buses must keep with the sidewalk as closely as possible to their right when stopping.

12—In all streets where there is not a space of at least 9 meters or 30 feet between the sidewalks, drivers of vehicles are not permitted to stop opposite a vehicle which is already standing on the other side.

13—Vehicles that are forced to make a half turn must take all precautions necessary so as not to hinder the traffic.

SECTION II—SIGNALS.

1—When slowing down or stopping, the driver of a vehicle must make a signal to those behind him by vertically raising the whip or hand.

2—On turning around or starting to move, he must indicate with the whip or hand the direction that he is about to take.

3—Before backing up, he must make a like sign, and while backing up, he must see to it that he does not push or hurt those behind him.

4—No vehicle is allowed to pass on that is not provided with the lights, etc., prescribed by ordinance.

5—The warning horns must serve for no other purpose, nor must they be used more than necessary, especially at night.

6—Cycles, tandems, tri-cycles, etc., must be equipped with an alarm device attached to the machine. The device must emit a sound that is heard at a distance of 50 meters or 165 feet, and must be capable of being put in operation whenever necessary, and only in such contingency.

SECTION III—RIGHT OF WAY.

1—Patrol wagons, ambulances, mail coaches and fire engines have the right of way over all other vehicles.

2—Street cars have the right of way over all other vehicles, except at crossings. Coachmen, etc., who have taken up the rails ahead of a street car must go off the track at the first signal of the conductor, motorman or engineer.

3—In streets where direction signs are displayed, all vehicles are to follow rigorously the direction indicated.

4—No vehicle must stop without good reason.

5—When a fire engine or any other emergency vehicle approaches, other vehicles must go as near the right, towards the sidewalk, as is possible.

SECTION IV. SPEED

1—No vehicle will exceed the speed limit set in the ordinance and that may be justified by the circumstances.

2—On crossing the streets, vehicles will slow down.

SECTION V. STREET CAR STOPS

Conductors will slow down, and stop their cars if necessary, on approaching the fixed and optional stopping places of street cars, when cars or trains are there already stopping to take on or let off passengers.

SECTION VI. CONTROL. SAFEGUARDS WITH HORSES

1—No carriage must stand on the public road without being guarded, or without its wheels being firmly locked by a rope or chain.

2—When riding on or leading a horse, the person in charge will never give the reins out of his hands.

SECTION VII. VEHICLES

1—Under no pretext will a vehicle be tolerated that is built or covered in such way as to prevent the coachman, etc., to distinguish clearly the carriages that follow it or are at its side.

2—No vehicle will be built or loaded in such a way as to hinder the general traffic.

3—Under no pretext must a vehicle be made use of or driven that is loaded with iron or other material which is likely to cause an unnecessary noise in striking together, unless the noise has been weakend or muffled by special device.

4—No vehicle may be driven by a person under 18 years of age and who is not competent for the purpose.

5—It is forbidden to cling or fasten oneself to the rear of any carriage.

SECTION VIII. CONDITION AND TREATMENT OF HORSES

1—Owners must not put in service horses who are not fit to do the work for which they are intended. It is also forbidden to make use of horses that are vicious or suffering from contagious diseases, ulcers or repugnant deformities.

2—No driver is allowed to crack his whip.

SECTION IX. RIGHTS AND DUTIES IN REGARD TO PEDESTRIANS, DRIVERS, ETC.

The carriage road is intended in the first place for vehicles, but it should be well understood that pedestrians have the right to cross it in safety. Street car conductors, drivers, etc., are therefore to use all necessary precautions, in order not to hurt or annoy those on foot; and these latter ones have the duty, before leaving the sidewalks and islands, to look ahead of them and see what vehicles or street cars are approaching.

Pedestrians are therefore, in their own interest, requested to mind the following precautions:

On passing the street, it should be done as much as possible at a right angle, and preferably at a regular passage.

The traffic will thus be assisted and the work of the horses be made less irksome, for often it is necessary to stop them in a brusque manner and pull back their mouths cruelly, so as not to hurt passers-by who are more or less negligent.

Such negligence of pedestrians will, however, in no case be an excuse for drivers, etc., who are not to annoy or hurt them.

The pedestrians who use the sidewalk will keep to the right. And in streets where the sidewalks are narrow, they will take the sidewalk on the right side. They will avoid stopping just at the crossing of a street, and do this rather on the sides of the sidewalk. They will also avoid standing aimlessly at theater exits or public meeting places.

Traffic Control Ideas by Coast Chief

Los Angeles Policeman Airs His Views on Handling Vehicles in Cities

LOS ANGELES, Cal., Sept. 16—"The question of regulating traffic is being considered in many states and cities and also in states and municipalities that possess traffic laws which require revision up or down, as the problem may demand," says C. E. Sebastian, chief of police.

"In discussing this question I shall go somewhat into detail as to what appears to be the most important phases of the situation and offer some suggestions concerning what I believe to be the better method of handling this branch of our work. The first important point is that of uniform laws for registration of motor vehicles. Hitherto, each state has passed laws in its own way—if the lawmakers have given the subject any consideration at all—but many of them have done so without properly weighing the consequences or effect of such laws as applied to the pedestrian or persons of foreign jurisdiction traveling within their states.

Variations in State Laws

"Some states prohibit the operation of a foreign motor car unless it displays a local number. Others permit it for periods ranging from ten days to an indefinite period. I suggest that all state laws regulating the registration of motor vehicles require annual registration, say dating from the first day of each year; that a uniform license fee based on a sliding scale, according to the power of the machine, be added, and that all cars display number tags front and rear. These conditions complied with, I believe it a good policy to allow the owner of the car to have the free use of the roads and streets of any state without additional cost, provided, however, that the said owner on entering a sister state, registers with the city clerk or recorder or other judicial officer, his name, car number, permanent and local address and the period of time he expects to remain in the city he is visiting. If he does not contemplate remaining there more than 24 hours, I would not exact these conditions.

"I favor, too, a law requiring all motor cars to be registered in the state in which they are when the period of registration expires. This will enable the authorities to keep track of them and prevent tramp machines being used by criminals or unscrupulous persons.

"Still another forward step would be in enacting a law which would compel each secretary of state to publish monthly a list of registered cars with owner's name and address, also that of chauffeurs, these lists or reports to be sent to the state secretaries free of charge. This law, too, might provide that each secretary of state be required to forward these reports to the chiefs of police of cities possessing more than 25,000 population. I prefer this method to that of a national registration, it being less cumbersome, and placing the motor cars and their owners in closer touch with the authorities.

"As to the general provisions of the state laws, I believe they should be uniform concerning regulations of movements of vehicles along highways and city streets. After a careful study of the laws of several states, I believe the maximum speed in congested districts where traffic is heavy, as within the shopping district, should be 12 miles per hour and have this district determined and described by the city law-making body. Outside of this district and inside the city limits, a maximum speed of 20 miles per hour would not be objectionable. Outside incorporated cities and towns, a maximum of 25 miles per hour would not operate as a hardship on any rational motorist. Speed on crossings within the congested district should not be more than 8 miles per hour and outside the congested district not more than 15 miles at any railroad crossing or where the view of the driver is obscured from cross streets or roads. Where local authorities designate a restricted district, they should be required to place signs in all principal streets leading into said district for the purpose of notifying the drivers to slow down to the legal speed limit of 12 miles.

Minor Regulations

"Of minor regulations, there are many things to be studied, each municipality or locality possessing different notions and rules for enforcement. These regulations insofar as possible should be uniform to the end that sensible and fair-dealing touring motorists will not suffer inconvenience and embarrassment when rounded up by well-meaning peace guardians.

"Drivers should be required to turn to the right on meeting vehicles moving in the opposite direction and to pass to the left when overtaking and passing vehicles going in their direction. In turning corners, the driver, when he desires to turn to the right, should keep to the right hand curb or gutter. In directing the vehicle to the left, the driver should go beyond the center of the street before turning. All drivers should be compelled to exercise due caution in approaching and passing vehicles and pedestrians. Of course, whistle, hand or other signals should be employed where a traffic police squad is maintained.

Favors Street Car Law

"Where there are street railways the driver should be compelled to keep his vehicle at least 4 feet from the street car when the latter is not in motion. In passing such car, the driver ought not operate his car at a rate of speed greater than 8 miles per hour. Intoxicated persons should be prohibited from operating cars and other motor-propelled vehicles at any and all times.

"Make it a felony for intoxicated drivers to injure any pedestrian or occupant of another vehicle and the criticism of this class of drivers will end with the decrease in this type of law-breakers.

"Every traffic law should require the use of mufflers on machines in operation in cities and towns and should prohibit the use of the cutout while the machines are inside the city limits. The smoke emitted by motor cars is a nuisance and easily could be regulated.

Examining Drivers

"Now to the question of compelling the drivers of motor vehicles to pass an examination. We do not require it in California, but I am urging such a law, as I believe it a safeguard in many directions. As evidence of the needs of such safeguards, not only to the public in general, but to the driver and his family, we only have to glance at the Monday morning papers and scan the list of Sunday accidents which reveal in some cases that entire families have been wiped out of existence as the result of collisions between electric or steam cars.

"These accidents as a rule are due to the lack of proficiency on the part of the driver, who, perhaps, is the head of a family and is busily engaged throughout the week, and for Sunday plans a trip into the country with his wife and family. Because of the fact that his nose is at the grindstone on week days, he has not familiarized himself with the country roads. Neither is he well acquainted with his car. Presently, as he guides the motor car along a pleasant lane or a splendid country highway, he encounters a railroad crossing. The warning toot or a steam or electric whistle alarms him—an express train may be approaching at lightning speed, or it may be an equally swift electric car. He finds himself in a dangerous position. His confusion and ignorance of what to do in emergencies like this one prevents him from properly using his brain and hands and the consequence is that he does the wrong thing at the wrong time—the coroner and the undertaker then figure in the case and the public says, 'What a pity; we ought to compel motor car drivers to undergo an examination, one that would require proficiency and a knowledge of what to do in such emergencies.'

"Every driver should be required to take an examination before a competent board of examiners appointed by the state executive and paid by the state. Examinations could be held fortnightly or at

longer periods—let that rest with the officials. After the driver has demonstrated his ability to operate and control a motor vehicle, a certificate should issue to him, enabling him to obtain a license upon the payment of a fee. Those desiring to qualify as professional chauffeurs would be under another class and should be required to furnish evidence of good character and sobriety.

"Each driver, whether chauffeur, owner or rider of a motor cycle, could be provided with a regulation book in which his license would be placed, with his photograph, and stamped with the state seal. It might be well to provide the book with blank pages, so that these could be used in stating the holder's record of violations and convictions—this to be rnscribed therein by the magistrate. The driver ought to be compelled to carry this book with him always, and to display it upon call when a peace officer makes the request. A copy of such records as are entered in this book should be forwarded to the secretary of state, this to provide him with a complete history in the event the driver loses possession of his book and license.

"When the owner or driver of a motor vehicle has been found guilty of a violation of the law or ordinance, I believe the magistrate, if the offense is sufficiently serious or flagrant, should have the authority to recommend that the license of either driver or owner be suspended or revoked, as the gravity of the offense may justify.

"This is another issue I am working to push through in Los Angeles. This should be a state law, but in the event it is not, I hope to induce the councilmen to enact an ordinance that will assist us in handling the cases of drunken drivers. As this question now stands, Lieutenant John L. Butler, commanding our traffic division, handles the situation in so far as it concerns the drivers of public motor cars. The drivers are required to obtain a street stand permit. When one of them operates a car while intoxicated, the lieutenant recommends the revocation of his street stand permit, and that teaches him a lesson, as his recommendation stands without question, because it is not exercised only in emergency cases."

ADDITION TO R. A. C. HOME

London, Sept. 14—The Royal Automobile Club's headquarters in Pall Mall, on the side of the old war office, have been open only about 18 months, but already they have been found too small. The club is preparing to build another wing to the premises, in which extra bedrooms will be provided for members, as well as rooms for the officers of the club. The present building occupies two-thirds of the former war office site, and the extension will cover the remaining third. The club has spent something like $1,500,000 on the premises and the extension will bring the cost of the whole undertaking up to well over $2,500,000.

Central Illinois Outlook

Rush Over Down-State After a Most Successful Season—Bumper Crops Make Good Business for Dealers—Demand of Farmers is for Low and Medium-Priced Cars

BLOOMINGTON, Ill., Sept. 21—The rush is over in the motor car business of central Illinois and dealers are commencing to summarize the year's business and plan for the year to come. The demand for cars in this territory has exceeded all expectations, and one firm, at least, has tripled its business during the fiscal year just closed. This firm, which has specialized on Overland cars, has sold 127 of this make and four of other makes, making the total for the year 131.

The central Illinois territory has been unusually favored by reason of bumper crops this season. Not only was the oat crop a record-breaker, but corn promises to give the greatest yield in a decade, providing there is no early frost. The crop is late and a frost before the first of October might create heavy loss in some sections. This danger is considered remote, however, and it is safe to say that the farmers of this section of the state will be blessed with well filled purses and a motor longing.

Dealers in this section of the state are preparing to cater to the rural buyer. It is believed that the rush in the cities is past. Most of the urban residents who can afford cars have been supplied, and, while there will be the usual shift from the old to the new car, the great mass of purchasers from now on will come from the country.

The farmers have the fever and the attack is not a mild one. They are starting out cautiously and conservatively and the great majority are averse to wrapping up several thousand dollars in a car before they know how to handle it. They prefer to buy a car from $800 to $1,200 and practice upon it. In the succeeding years, if they have the money, they will buy a higher priced article.

The agents in the smaller towns contiguous to Bloomington, and who sell almost exclusively to the farmers, agree that this view of the situation is correct. Sales of cars above $1,500 have been few and far between during the past year in the territory outside of Bloomington. Ninety per cent average $1,000. The local dealers also report that it is becoming difficult to interest city buyers in the high priced cars. Even the men who can well afford to buy a car ranging from $3,000 to $5,000 are, in the majority of instances, going below $2,000, and the makes above the latter figure are meeting with slow sale.

It also is being demonstrated that the curbstone agent has small chance in competition with the dealer who operates garage and suite of offices in which to receive buyers. The former are rapidly being driven out of the business in this territory and the larger institutions are monopolizing it. The retail business is appearing to be centralized and restricted very much like the wholesale and the manufacturing. This is severe upon the ambitious youth with plenty of enthusiasm and a good car who is without capital to install his business in a respectable appearing building.

Not only has the year been a prosperous one for the dealers in gasoline cars, but this territory has furnished profitable picking for those who handle the electrics. In fact, the electrics comprise about all of the high-priced cars disposed of in this territory this year. There were twice as many gasoline cars sold in 1911 costing above $2,000 than during 1912. The sale of electrics ranging around $3,000 has doubled over the preceding year.

Reports of a scarcity of cars for the year to come are coming in and are regarded by the local dealers as an indication of prosperity. A shortage of anything always begets a demand and the difficulty in procuring cars during the next 6 months means that the demand will strengthen. It is predicted that the business in central Illinois during 1913 will far exceed the banner year now waning.

HOOSIERS PREPARE FOR CONVENTION

Indianapolis, Ind., Sept. 23—A motor parade with no fewer than 2,000 cars in line, a balloon ascension with the passengers riding in a motor car substituted for a basket, demonstrations in skillful driving, a dinner and addresses by advertising men of national reputation will be among the features of the national salesmanship and advertising convention, to be held in Indianapolis, Tuesday and Wednesday, October 8 and 9. W. D. Nesbit of Chicago will preside over the convention as permanent chairman, according to present plans. An address of welcome will be delivered by Charles A. Bookwalter. Among the prominent advertising men who will make addresses on salesmanship will be Elbert Hubbard of East Aurora, President Sheldon of the Sheldon School of Salesmanship, John Lee Mahin of the Mahin Advertising Co., Leroy Pelliteer, Detroit, director of advertising for the Flanders; Martin Kelley of the Fuller advertising agency, General Manager Deeds of the National Cash Register Co. and General Manager Laskar of Lord & Thomas. Those who are promoting the convention believe that 1,000 motor car salesmen will attend.

Bumper Crops in Dakota

Reports from Farmers Encourage Dealers in Motor Cars Who Prepare for Heavy Fall Business—Salesmen Travel Through Rural Districts Running Down Prospects

FARGO, N. D., Sept. 23—Bumper crop conditions in North Dakota this fall are attracting the attention of car manufacturers and dealers everywhere, with the result that a number of new agencies already have been established or announced for Fargo and other state cities. Old agencies already in the territory are increasing their sales forces to handle the increased amount of business which the dealers believe is assured.

Crops in the state are now beyond the prospect stage and it is certain the farmers will harvest the biggest yields of the past 15 years. While harvest and threshing have been delayed by the heavy and frequent rains during August, the work now is far enough along to forestall further weather damage and to give reliable indications of what the yield will be.

Wheat, the leading crop of the state, will give a yield several bushels above the average for the last 15 years and almost double the yields reported for the 2 previous years, both of which were attended with crop failures. Reports that the heavy rains had started the grain sprouting in the shock are denied by farming experts who have traveled through the state. In certain sections of the state grades have been lowered but the damage is not sufficient to affect the state as a whole.

Flax, barley, rye and oats are all yielding crops far above the average. Corn is ripening rapidly now and experts believe that for the first time in the history of the state the farmers will raise their own seed corn for 1913 planting. Potatoes have been attacked by a form of stem rot. In spite of what damage this may do the yield is likely to be so large that the price will go very low.

Motor car salesmen already are busy among the farmers of the state and the number of orders received at the branch houses is increasing rapidly. All grades of cars are being sold, the orders including high-priced touring cars as well as the lighter cars and those constructed with especial provision for the farmer's needs.

QUAKER WHEEL TAX PROPOSED

Philadelphia, Pa., Sept. 20—Mayor Blankenburg, in his fall message to the councils yesterday, offered a suggestion that directly concerns every car owner in Philadelphia and that has called forth protests from motor car organizations and agents. His proposition is to the effect that a municipal wheel tax be levied on all motor cars according to horsepower, as a means of increasing the annual revenues of the city and reducing the deficit. The mayor thus sets forth his proposition:

"It seems to me that if not in conflict with state laws the city should charge a tax on motor cars—the state tax is $10—pleasure as well as business. This tax—of 25 to 50 cents a horsepower per car per annum—should be made applicable to the maintenance of highways. No one will gainsay the fact that motor cars are largely the cause of the heavy cost of street repairs and maintenance—particularly on the macadam and country roads, of which we have more than 400 miles—and add materially to the labors of the department of public safety."

ASHLAND COUNTY'S ROAD WORK

Ashland, Wis., Sept. 23—Ashland county, Wis., has, during the season of 1912, constructed more permanent highways than any county in Wisconsin, which is regarded as particularly remarkable in face of the fact that Ashland is one of the northermost counties in the Badger state, bordering on the south shore of Lake Superior, and that most of its area is still a wilderness.

The fine showing of Ashland county is due to the excellent organization of its highway division under the new state aid law of Wisconsin. George Foster, a millionaire lumberman of Mellen, Ashland county, and naturally deeply interested in the development of the territory for settlement, accepted the appointment as highway commissioner. Throwing his entire resources behind the good roads movement in Ashland county, Mr. Foster took the good roads fund of $77,000 provided by bond issue of the county, the state aid apportionment and moneys raised by the townships, and added to it a complete railroad system, a half-dozen steam and gasoline rollers and a crew of experienced road builders from his own lumber camps and mills. The railroad system, consisting of 10 miles of standard gauge track, an equal mileage of portable trackage, a second-hand locomotive and a string of forty dump cars, has decreased the otherwise large and important item of transportation and haulage of road construction materials to nothing.

The principal work this year consisted of constructing a permanent highway, 45 miles long, from Ashland to Butternut, via Mellen, stretching entirely across Ashland county from its northern end to southern boundary. The road runs along the right of way of the Soo line, the tracks being ½ mile from the road at the greatest point, and generally within 100 to 300 feet of the tracks. This enabled Mr. Foster to build spur tracks to various points and haul his materials and tools to and from the Soo line, which contracted for the haulage from the source of supply.

The state highway commission early in the year arranged with all railroad systems for reduced rates for hauling materials, which, too, enabled the Ashland road builders to haul rock from the iron mines at Bessemer, Mich., to Ashland, a distance of 50 miles, at $1.50 per car. The cars were turned over to Mr. Foster's railroad at various points.

BUFFALO HOLDS GYMKHANA

Buffalo, N. Y., Sept. 23—About 1,500 motorists in 400 cars witnessed the fourth annual gymkhana of the Automobile Club of Buffalo at its country club grounds at Clarence, N. Y. Results of the various events were as follows:

Tortoise race, winning car being designated as one last to arrive at finishing line. Won by W. C. Frank, Pullman. Time, 5:22.

Thread-needle race, each contestant being compelled to drive 50 yards, alight and run afoot 50 yards to a woman stationed at the end of the field, thread a needle and return to his car accompanied by the woman furnishing the needle and then drive to finishing line—Won by W. C. Gibson, National, assisted by Miss C. Stedman. Time, :40⅘.

Potato race, with car moving over prescribed course. Driver was accompanied by woman who dropped potatoes in flower pots, winner to be woman who could drop a potato in each pot—Won by Edwin J. Boeck, in Overland, accompanied by Miss Elinor Boeck, who dropped one potato in each flower pot.

Cigar-lighting competition, each contestant driving to first station of course and alighting, removing his coat while so doing and then lighting a cigar; driving to next station, alighting and drinking a glass of water and then driving for finishing line with coat buttoned and cigar lighted—Won by Charles O. Almendinger, Hupmobile. Time, 1:16⅘.

Nightingale competition, each competitor driving 50 yards, stopping his car and then running 50 yards afoot to a woman stationed at end of course; whistle an air, the name of which was to be written on paper by the woman posing as the auditor; return with the woman to the car, start the engine and then spurt for the tape. E. A. Kinsey, Velie, accompanied by Mrs. W. F. Polson.

Bomb race, driver making fastest time over course filled with vari-colored balloons fastened to small stakes, the winner to be the car bursting the most balloons—Won by Augustus F. Scheu, Jr., Hupmobile, with six punctured balloons to his credit.

This was won by Augustus F. Scheu, Jr., in 2 minutes.

IOWANS OUTLINE RELIABILITY

Des Moines, Ia., Sept. 23—V. W. Reynolds and Logkeeper A. R. Hultman are this week blazing the way for the annual endurance run of the Iowa Automobile Association, which will start on October 7. A Chalmers six is being driven by the pathfinders. As now outlined, the run will leave Des Moines over the River-to-River road as far as Adel, where it will take the White Pole road to Council Bluffs, which will be the first night's stop. The second day out will follow the Missouri river to Sioux City for the night control. Fort Dodge probably will be the third night control, the Hawkeye highway being followed part of the way from Sioux City. The fourth night will be spent at Cedar Rapids and the trip home on the fifth day will be by way of Oskaloosa.

Routes and Touring Information

FALLS AND OLD MILLS AT STODDARDVILLE, PA.

Circle Tour from Chicago

CHICAGO.—Editor Motor Age—Early in October I intend to make a motor car trip of 1,000 to 1,500 miles originating in Chicago. Kindly inform me where I will find the finest scenery and the best roads. I know already the east. —Foreigner.

For an Indian summer trip it would seem quite in keeping to visit the land of Minnehaha. The country that lies between the Windy City and the Twin cities is varied in aspect and richly picturesque. At the season selected for your tour the luscious greenery of the summertime that gave the heated landscape a cooling tone, as the air has become tempered assumes warmer tints, and these autumnal glories of the northern woods are too seldom seen by Nature's summer lovers. Few know, and therefore appreciate the wealth of joy to be found on the hills and in the forest ways after "the first sharp frosts have fallen." It is Nature's vacation time, and with her free flung banners invites all to join in such a love feast as she spreads at no other season of the year. It is the ideal time for touring.

To reach this storied land of Indian fable drive west on Jackson boulevard through Garfield park, Oak Park and Addison to Elgin, made famous by the watches manufactured there, and its great dairy interests. Following along the east side of the Fox river one reaches Algonquin, known to the world through the yearly motor classic hill climbing event, then on the west side of the river following its charming valley filled with beauty, on through McHenry, Richmond and Genoa Junction to Lake Geneva. A splendid driveway encircles the lake, faced by the summer palaces of many of Chicago's wealth laden citizens. Proceeding in the afternoon through Delavan, Emerald Grove, Janesville, Edgerton and Stoughton, winding among Wisconsin's numerous lakes, to Madison, makes the mileage of the day about 160 miles over good roads. If the trip around Lake Geneva is made, perhaps not much time will be left for seeing Madison that day.

The forenoon of the second day can very well be spent enjoying some of the most delightful drives in and around the Badger state capital, and site of the state university. Turning northward from this seat of learning and center of world-wide civic problem solving, the way lies through Pinebluff, Barneveld, Dodgeville, Edmund Station, Cobb, Montford, Fennimore, Mount Hope and Bridgeport reaching the broad Mississippi at Prairie du Chien. Fair to good natural dirt roads will have been found through the rolling, hilly, beautiful country in this part of Wisconsin, which affords many delightful views that are well worth overcoming the few intervening poor stretches of road. This is a portion of a cross-state route the entire length of which must eventually be put in a condition commensurate

FLANDERS ON NULREIGH HILL BETWEEN NEW HAVEN AND BUFFALO, KY.

Waseca on the way to Onatonna. Bearing now to the south the route runs through Geneva, Albert Lea, Glenville, Northwood, Kensett and Manly, making this day's run into Mason City about 195 miles.

On the fifth day continuing southward through Iowa's great dairy country, over dirt roads good in dry weather, Hampton and Ackley will be passed through on the way to Marshalltown. Here the route intersects the official Iowa transcontinental route which will be followed eastward through Montour, an Indian reservation, Tama and Belle Plaine to Cedar Rapids, which may be selected as this night's control, the distance traveled being about 167 miles.

The transcontinental route may be followed clear to the state boundary at Clinton touching by the way Mt. Vernon, Mechanicsville, Clarence, Lowden, Wheatland, Grand Mound, DeWitt and Elvira. At Clinton, Eagle Point park will be found of interest. Crossing into Illinois, a most direct route connects with Chicago via Morrison, Sterling, Dixon, Franklin Grove, Ashton, Rochelle, Creston, DeKalb, Geneva, Lombard and Maywood.

But as the mileage limit mentioned has by no means been overrun, it would be interesting to leave the transcontinental route at Clarence, bearing to the southeast through Bennett, to Davenport in the Tri Cities—Davenport, Moli Rock Island—is found one of th important manufacturing centers middle west. Rock Island park island by that name should be where Col. Davenport's original may still be seen. From Moline th follows up the exceptionally del valley of the Rock river passing t Hillsdale and Lydon to Sterling, the remainder of the route as o above may be followed to Chicago.

Running directions for the greate tion of this route may be found Automobile Blue Books, volumes 4

ALBANY TO LOS ANGELES

Albany, Mo.—Editor Motor Age—I give me information on a route fro bany to Los Angeles. Which would best, the north or the south route we go the south route how about the and desert? What is the distance o south route? As to the north through Salt Lake, would it be too this time of year?—J. N. Barger.

In taking the northern route to fornia it will be remembered that w sets in early in the Sierra mountains, on account of the snows it will be f difficult to get through later than the dle of October. In speaking of the t continental highways this is mentione

STEEP WINDING DESCENT 2 MILES LONG NEAR CATTARAUGUS, N. Y

AT STODDARDVILLE, PA.

the most practical, and the Santa Fe or Old Trails highway as the most scenic and interesting.

Routing to Kansas City by way of St. Joseph, you follow this Santa Fe trail across Kansas, through Emporia, Newton, Hutchinson, Dodge City, La Junta, Colo., and Trinidad, a town-to-town itinerary to Phoenix, Ariz., being followed as given out to an inquirer from Denver, Colo.

You will not strike any bad sand until you reach California, just about at Glomis, where you have to do some low-gear work. It is well to be provided with some narrow strips of canvas to put under the tires to get traction in the worst places.

CROPSEY, ILL.—MANITO, ILL.

Cropsey, Ill.—What is the best route from Cropsey, Ill., to Manito, Ill., and from Cropsey to Danville?—D. E. Crum.

Go directly south until you come to the Bloomington-Gibson City road and follow it west 18 miles to Bloomington, continuing through Danvers, Lilly, Mackinaw, Tremont, Pekin, Manito. Routing to Danville, upon reaching the Bloomington-Gibson City road turn east 15 miles to Gibson City, and 18 miles to Paxton, then south 30 miles to Champaign through Rantoul. Danville is 39 miles east through Urbana, Homer and Catlin. There is another road 3 miles shorter, but only dirt and not so good.

MINNEAPOLIS—LOS ANGELES

South Haven, Minn.—Editor Motor Age—I shall leave Minneapolis November 1, and drive to Los Angeles via New Orleans, Galveston, and El Paso. Will you give me the best routing for that time of year? The answer to Mr. Potts in the September 12 number will be all right from El Paso to Los Angeles.—Frank E. Sutton.

Route first to Waterloo, Ia., 211 miles, through St. Paul, Rosemount, Farmington, Northfield, Dundas, Faribault, Medford, Owatonna, Blooming Prairie, Lansing, Austin, St. Ansgar, Mitchell, Osage, Charles City, Nashua, Plainfield, Erma, Waverly, Janesville, and Waterloo. It is 139 miles to Davenport, passing through Washburn, La Porte, Mt. Auburn, Vinton, Shellsburg, Palo, Cedar Rapids, Marion, Mt. Vernon, Lisbon, Mechanicsville, Stanwood, Clarence, Bennett, New Liberty, Maysville, and Davenport.

Quincy, Ill., is 166 miles distant through a rolling country and the towns of Rock Island, Milan, Swedonia, New Windsor, Alpha, Henderson, Galesburg, Abingdon, St. Augustine, Avon, Prairie City, Bushnell, Macomb, Colchester, Tennessee, Plymouth, Augusta, Bowen, Loraine, Mendon, Ursa and Quincy.

St. Louis, Mo., is situated 155 miles south, going first through Illinois to Seehorn and Sheperd, crossing over two bridges to Hannibal, Mo., and running along the river in Missouri to Oakwood, New London, Frankford, Louisiana, Rocky Ford, Prairieville, Auburn, Troy, Flint, Wentzville, Dardenne, Cottleville, St. Charles, Pattonville, Wellston, St. Louis. A day's journey of 169 miles is Maxville, Antonia, Hillsboro, Victoria, De Soto, Bonne Terre, St. Francois, Flat River, Farmington, Valley Forge, Weingarten, New Offenburg, Ste. Genevieve, Perryville, Longtown, Uniontown, Appleton, Fruitland, Jackson, and Cape Girardeau. To Jonesboro, Ark., you have gravel and dirt roads 154 miles, through Dutchtown, Allenville, Aquilla, Bloomville, Dexter, Campbell, St. Francis, Piggott, Rector, Marmaduke, Paragould, Brookland, and Jonesboro. Memphis is 119 miles distant and for the most part over quite poor roads, the towns being Greenfield, Harrisburg, Whitehall, Wynne, Forrest City, Madison, Marion, Mound City, and ferry over the Mississippi river, following the trolley into Memphis.

The No. 5 Blue Book can be used for running directions until Memphis is reached, when the No. 3 is taken up. The National tour, formerly known as the Glidden, is to travel from Memphis to New Orleans over the same route we are giving you. The trip is divided as follows: To Sumner, 120 miles, the towns are Lynchburg, Lake Cormorant, Clacks, Robinsonville, Hollywood, Tunica, Evansville, Clayton, Dundee, Rich, Coahoma, Cloverhill, Clarksdale, Tutwiler, Sumner; to Jackson, Miss., 165 miles, pass through Whitehead, Glendora, Schlater, Greenwood, Lexington, Franklin, Goodman, Pickens, Canton, Madison, Ridgeland and Tougnloo; to Baton Rouge, La., 179 miles, is Terry, Crystal Springs, Hazlehurst, Beauregard, Wesson, Brookhaven, Norfield, Johnston, Osyka, Kentwood, Greensburg, Baton Rouge; then New Orleans, 119 miles, through Darrow and Kenner.

Heading west through Louisiana the following towns offer the best roads such as they are: Westwego, Hahnville, Edgard, Donaldsonville, Thibodaux, Schriever, Houma, Gibson, Morgan City, Franklin, Jeanerette, New Iberia, Lafayette, Crowley, Midland, Jennings, Lake Charles, Orange, Tex.

To reach Galveston you should route through Beaumont, Liberty, Houston, Harrisburg, Genoa, Webster, League City, Dickinson, and Lamarque. Return to Houston and follow through Hemstead, Brenham, Austin, Georgetown, Burnet, Lampasas, Ballinger, San Angelo, and then the directions given in the September 12 issue can be used. However, instead of routing from Lordsburg, N. M., to Bowie, Benson, Tucson, etc., the best and easiest route is via Douglas, Bisbee, Hereford, Huachuca, Tucson, Florence and Phoenix, as given in the story written by W. T. Rand, of El Paso.

MELLOTT, IND.—MUNCIE, IND.

Mellott, Ind.—Editor Motor Age—I am going to make a trip to Muncie, Ind., and would like the most direct route.—Wm. J. Mellott.

Go to Hillsboro, and, as outlined in the Blue Book, the route extends 15 miles to Waynestown and Crawfordsville, then 46 miles to Whitesville, New Ross, Jamestown, Pittsboro, Brownsburg and Clemont. You have a choice of two roads to Muncie, the shorter having numerous turns and routing through Oaklandon, McCordsville, Pendleton, Anderson and Muncie, with a mileage of 62 miles, as against 67 miles through Cumberland, Greenfield, Maxwell, Pendleton, Anderson and Muncie. Either road is good gravel.

WOULD REPEAT JOURNEY

Randolph, Wis.—Editor Motor Age—Last year I took a trip to Palacios, Texas, outlined in Motor Age in the issue of October 5. This same trip is to be repeated, and I would like to know if any changes should be made in the itinerary.—J. L. Richards.

Motor Touring Conditions

THE Blue Book car has just returned to the Chicago office after completing a 6,500-mile trip in Indiana, Ohio, Kentucky and Illinois.

A new route is Nashville to Paducah via Clarksville, Ky. First few miles out of Nashville are excellent macadam. Rest of the way are natural dirt roads with very little improvement. These roads are none too good for the most part, but even so, this route is much better than the Louisville-Nashville route. There are two or three small fords which will give no serious difficulty except in very high water. The trip should not be attempted in wet weather due to the slippery clay soil which in some cases would make it impossible to get up the steep climb from one or two ferrys.

A new route is Paducah to St. Louis via Anna and Murphysboro. From Paducah the ferry is taken across to the Illinois side and unimproved dirt roads are encountered all the way, some parts fairly good, most of it being pretty rough, due to no improvement and not much travel.

Cairo to St. Louis is new. This is identical with the above route with the exception of the first part to Anna. Blue Book car also covered the connection from Cairo to Cape Girardeau and Cape Girardeau to Anna making a St. Louis-Cape Girardeau route on the Illinois side of the Mississippi.

St. Louis to Springfield via Alton, Brighton and Carlinville is new. This is over fairly good dirt roads, last part from Alton being quite good. There are a few stretches of fairly bad sand in dry weather between St. Louis and Alton.

A new route is Springfield to Louisiana via Jacksonville and Pittsfield. Road conditions on this route are fairly good dirt all the way with one exception, which is in the bad

For the most part a change would be advisable in the west, not for the reason of finding better roads, but to see a different section of the country.

Undoubtedly you have made the run to Portage and Madison. Between Portage and Madison you will find a little sand, but the last half of the route is particularly good. To reach Dubuque, Ia., you will have some very rolling country and some steep grades 103 miles through Pinebluff, Mt. Horeb, Blue Mounds, Barneveld, Ridgeway, Dodgeville, Mineral Point, Calamine, Platteville, Cuba, and Dubuque.

The first few miles out of the Mississippi valley are up grade, but the rest is all a level farming section over the Hawkeye highway across the state. Waterloo, Iowa, is 91 miles through Julien, Centralia, Epworth, Farley, Dyersville, Earlville, Manchester, and Independence. It is 111 miles to Fort Dodge and through Cedar Falls, New Hartford, Parkersburg, Austinville, Ackley, Iowa Falls, Alden, Williams, Blairsburg, Webster City, Fort Dodge, to Omaha is 192 miles through Moorland, Rockwell City, Sac City, Early, Shaler, Odebolt, Kiron, Deloit, Denison, Arion, Dunlap, Woodbine, Logan, Missouri Valley, Crescent, Council Bluffs, and following the boulevard over the Missouri river to Omaha.

On the Omaha-Denver transcontinental trail 124 miles to Fairmont, you pass through Millard, Gretna, Ashland, Waverly, Havelock, Lincoln, Emerald, Milford, Friend and Exeter, then, following the Meridian road south clear through Kansas, first going 152 miles to Salina, through Geneva, Strand, Brunning, Belvidere, Hebron, Chester, Belleville, Concordia and Minneapolis. The Kansas-Oklahoma state line is then reached through Bridgeport, Lindsborg, McPherson, Moundridge, Hesston, Truesdale, Newton, Wichita, Wellington, South Haven and Caldwell, with 164 miles of travel.

Through Oklahoma the Meridian road is known as the Chisholm trail. Go through Renfrow, Medford, Pond Creek, Kremlin, Enid, Waukomis, Hennessey, Dover, Kingfisher, El Reno being 126 miles, Oklahoma City lying 27 miles to the east. It is a distance of 157 miles to a crossing over the Red river to Burkburnett, Texas, the intermediate towns being Pocassett, Chickasha, Verden, Anadarko, Apache, Rohrer, Lawton, Emerson and Randlett.

Fort Worth, Texas, is reached through Burkburnett, Wichita Falls, Windthorst, Antelope, Jacksboro, Whitt, Adell, Weatherford, Annetta, Aledo and Ben Brook. The balance of the way to Palacios is the same as outlined for you before.

KEOKUK TO ZANESVILLE

Nauvoo, Ill.—Editor Motor Age—I would like to see a route from Nauvoo to Zanesville, O., published. I want to get on the national pike at Indianapolis or sooner if it extends any farther west than Indianapolis.—R. S. Ward.

From Keokuk to Quincy it is 38 miles through Hamilton and Ursa, then 120 miles to Springfield through Fowler, Paloma, Coatsburg, Camp Point, Clayton, Mt. Sterling, Ripley, Rushville, Frederick, Bearstown, Virginia, Philadelphia, Ashland, Pleasant Plains and Bradfordton. It is 150 miles to Terre Haute, Ind., mostly over natural dirt roads, through Dawson, Lanesville, Niantic, Decatur, Antioch, La Place, Lovington, Chesterville, Arcola, Oakland, Redmon, Paris, Elbridge and Terre Haute. Then the National pike extends to Indianapolis, 70 miles, through Seeleyville, Brazil, Harmony, Reelsville, Coatsville, Stilesville, Belleville, Plainfield, and 172 miles to Columbus through Cumberland, Greenfield, Cleveland, Knightstown, Ogden, Lewisville, Cambridge City, Germantown, Centerville, Richmond, Gettysburg, Vandalia, Tadmore, Brandt, Donnelsville, Springfield, Harmony, Brighton, Lafayette, West Jefferson, Alton and Columbus. A distance of 60 miles lies between Columbus and Zanesville, which is reached through Columbia Center, Granville, Newark, Hanover, Nashport and Irville.

For running directions you can secure a No. 4 Blue Book.

MADISON, WIS.—DUBUQUE, IA.

Randolph, Wis.—Editor Motor Age—Kindly outline a trip from Madison, Wis., to Dubuque, Ia., thence to Sac City, Ia., Britton, S. D., and returning to Dubuque by way of Tracy, Minn. Also what is the direct route from Britton to Madison? —W. D. Porter.

The road from Madison to Dubuque and Sac City is outlined in this issue in the answer to route from Randolph, Wis. Sioux City is 84 miles west, the road lying through Early, Shaller, Holstein, Cushing, Correctionville, Moville and Lawton. Route 87 miles through Jefferson, Elk Point, Beresford, Worthing and Sioux Falls. Bridgewater is 41 miles to the west on the Meridian road and you head north on this road through Salem, Madison, Arlington, Watertown, Summit, Peever and Sisseton, 169 miles. Britton is in the next county and about 40 miles.

ON THE PACIFIC HIGHWAY

Routing back over the same road to Arlington, go east to Volga, Brookings, Aurora, Elkton, Lake Benton and Tracy, 230 miles. To reach Mason City, Ia., you will travel 212 miles through Walnut Grove, Revere, Springfield, Sleepy Eye, New Ulm, Courtland, Mankato, Janesville, Waseca, Meriden, Owatonna, Geneva, Albert Lea, Glenville, Northwood, Kensett, Manly and Mason City. Dubuque is then 172 miles distant, passing through Rockford, Marble Rock, Greene, Packard, Clarksville, Shell Rock, Janesville, Cedar Falls, Waterloo, Jessup, Independence, Winthrop, Manchester, Earlville, Dyersville, Farley, Epworth and Delhi.

As for the most direct route from Britton, S. D., to Madison, Wis., upon reaching Owatonna, Minn., instead of branching south into Iowa, continue east to Eden, Dodge Center, Kasson, Byron, Rochester, Dover, St. Charles, Utica, Lewiston, Stockton, Winona, Witoka, Ridgeway, La Crescent and La Crosse, which will register 125 miles. The La Crosse-Madison stretch is 146 miles through St. Joseph, Middle Ridge, Portland, Cashton, Ontario, Kendalls, Elroy, Union Center, Wonewoc, La Valle, Reedsburg, Abelmans, Baraboo, Sauk City and Madison.

The mileage for your first trip is 1,891 miles and for the second 1,276, and your Wisconsin license will be all that is required in Iowa and South Dakota, but in Minnesota a non-resident courtesy tag, which is good for 60 days, is necessary. The Blue Book contains running directions for both tours.

in Middle West Section

sandy stretch leading to the ferry across the Illinois River at Pittsfield. This is over 1 mile long and there is a farmer who camps out and makes his living during the summer hauling cars out of the sand. People interested in this route report that same will be fixed for next year, but at present it is pretty bad, especially in dry weather.

Louisiana to Hannibal is via the west side of the river. This is fair to good gravel all the way. Considerable improvements are being made for next year.

To Quincy crossing the Mississippi at Hannibal. This route is either gravel or good dirt practically all the way.

Quincy to Keokuk is via the Illinois side. The first few miles out of Quincy is good gravel, rest of the way fair to good roads in dry weather.

Keokuk to Peoria via LaHarpe and Bushnell is new. In dry weather this route is a very good one and for the most part is over the Illinois extension of the Waubonsie Trail. At LaHarpe the connection was made to Monmouth, which is on the Chicago connection of the Waubonsie Trail and ties in at that point with the regular Blue Book route to Chicago.

Peoria to Bloomington via Mackinaw. The Blue Book crew made careful inquiry relative to new route between these two important cities and found that regular route was best.

Bloomington to Ottawa via El Paso, Minonk and Streator is good dirt road in dry weather to Winona; rest of the way almost all gravel.

Ottawa to Chicago via Aurora is for the most part the same, although one or two slight changes were made for next year, due to road improvement.

The Readers

What, Why and Wherefore of Oblique Wheel Setting Explained for Windy City Reader—Foreigner in Chicago Wants to Know Regulations Controlling Traffic

Dish, Camber and Gather

Chicagoan Makes Useful Query in Regard to Angle of Mounting and Structural Differences

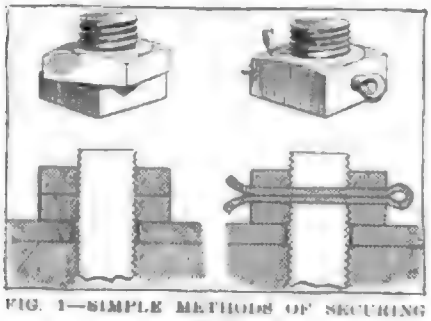


FIG. 1—SIMPLE METHODS OF SECURING NUTS.

CHICAGO.—Editor Motor Age.—Please define dished wheels, set wheels, gathered wheels, and artillery wheels. I am told that these terms refer to angles at which the wheels of vehicles are placed on their axles, but do not quite understand the exact nature of such a manner of applying them. Please also explain the difference between an artillery wheel, such as used on motor cars, and an ordinary carriage wheel. Also why these differences, and manners of applying vehicle wheels exist, and whether artillery wheels should have dish, set, and gather; any or all.—J. W.

1.—Dished wheels are those whose spokes are inclined at an acute outward angle to the spindle.

2.—Set, or properly, cambered wheels are those whose spindles are downwardly inclined, so that in a pair of wheels, so disposed, the upper portions of their tires will be farther apart than the lower portions of the tires.

3.—Gathered wheels are those whose spindles are forwardly inclined, so that in a pair of wheels, so disposed, the front portions of their tires will be closer together than the rear portion of the tires.

4.—Artillery wheels are those whose spokes are set all in a true plane, commonly known by the descriptive term of straight wheels and are usually set as in Fig. 6.

The difference between an artillery wheel and an ordinary carriage wheel is that the artillery wheel is straight, and the carriage wheel is dished. The term artillery comes from their origin. The wheels of gun trucks must withstand great loads in a vertical direction, but are required to stand but little side strain.

Dished wheels were evolved in carriage practice, to enable a pair of wheels to withstand the side strain imposed upon them by centrifugal force in turning corners, and still keep their weight low. The inclination of the spokes transmits outside thrust endwise, through the spokes to the hub, so that the spindle collar absorbs it, instead of the whole strain being taken by the spokes themselves. Of course only the outside wheel takes the thrust for a given pair of wheels, but owing to the disposal of the thrust, the strength of a dished wheel in this direction is more than equal to the double strain.

This dishing, however, as it strengthens the outside of the wheel, so weakens the inside. If a dished wheel is set on a horizontal spindle, the vertical or load thrust is brought to bear at a sideways angle to the spokes, on the weak side of the wheel, and the tire is brought into contact with the road at an angle. To overcome this difficulty, makers camber the dished wheels, Fig. 5, which brings the spokes vertical to the road, so that the load is taken endwise of the spokes. This, in turn gives rise to an unbalancing of the wheel, so that it would normally run in an outward circle, and if restrained from so doing by mounting it in parallel with its mate, the tire would undergo a constant grinding, such as a straight artillery wheel would be subjected to, if run continuously in a circle. To overcome this, the wheels are gathered at the front,

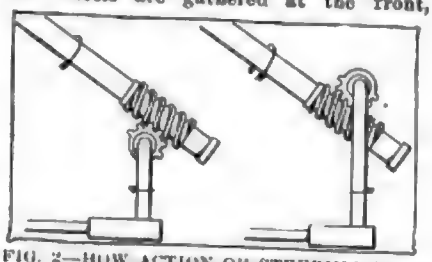


FIG. 2—HOW ACTION OF STEERING GEAR MAY BE REVERSED BY LINKAGE

which overcomes this tendency, and eliminates the grinding, by causing the tread to contact with the road at its center instead of at its side. A wheel so set will run in a straight course, with a true rolling road contact.

It is an open question whether artillery wheels should be disposed with camber and gather. Of course an artillery wheel, by its very nature cannot be dished. Certain it is that camber without gather is a dynamic error. The tire of a cambered, but not gathered wheel is subjected to a constant grinding and does not run on the middle of its tread, subjecting it to strains and wear for which it was not designed.

The advantages of camber with a straight wheel are that owing to the angle of incidence with the road of the spokes, centrifugal thrust in rounding curves is resisted by the spokes of the inner wheel, to a certain extent in a longitudinal direction to the spokes, which makes the wheel strong enough to withstand the strain of both wheels better than each could, were they parallel. Owing to their small size, as compared with carriage wheels, it has never been to any extent seriously considered necessary to dish the wheels of a motor car; and inasmuch as such dishing must be accompanied by corresponding camber and gather, it offers difficulties in the construction of the live rear axle that all but preclude it, and it is hardly thought worth while to do so only on the front wheels.

AUTOCRAT ANSWERS

Kennedy, Minn.—Editor Motor Age—I have any amount of trouble in starting a 1911 Olds Autocrat on cold mornings What is the construction, theory and value of the fire screen in the carbureter?

2—We use the Bosch high-tension dual system, and sometimes when the batteries do not work, by switching to the magneto and placing the spark lever way up, the car can be cranked with a few brisk turns. Why do we not get a kick?

1—The Oldsmobile Autocrat is equipped with an air shut-off which should be employed to facilitate starting on cold mornings. The fire-screen formerly used on Oldsmobiles was for the purpose of breaking up the gases in case of an intake backfire, and preventing injury to the carbureter. It was made of 16-mesh bronze gauze, but owing to the necessarily fine mesh, requisite to accomplish the purpose for which it was designed, it has been found to survive but few backfires before going to pieces and demanding instant removal, to prevent injury being done to the motor. This is a difficult and troublesome task, and for these reasons its use has been abandoned on that car.

2—If you do not get a kick when you crank with an advanced magneto spark, your timing is off. Retime your motor, so that the retarded spark occurs on dead center, get your batteries in condition, and do not try to crank your motor with an advanced spark. An Autocrat kick is a serious matter. Like mules, motors that will not kick when tempted, are sick

INTERESTED IN THE JACKSON

Chicago, Ill.—Editor Motor Age—What is the weight of an unequipped Jackson 52, five-passenger touring car?

2—Of what make is the differential and what is its weight?

Clearing House

Willys Built Six—All That Is Benz is Not Blitzen—Steering of Oldfield's Freak Is Like Standard—Once a Steamer Always a Steamer—Unequal Carbonization Explained

3—Who is the Chicago representative of the differential maker?

4—What is the brake-test horsepower of the above mentioned car?

5—How can a clutch be remedied which slips if the speed surpasses 35-38 miles?

6—Is it permitted in Chicago to pass a street car on the left-hand side if she is discharging passengers?—Foreigner.

1—3,000 pounds.

2—The differential is furnished by the Weston-Mott Co., Flint, Mich. It weighs 000 pounds.

3—Weston-Mott Co., 140 S. Dearborn St.

4—The model 52 motor delivers a little over 52 horsepower on the brake.

5—Slipping clutches are the result of a number of causes. In any clutch, slipping will be the result of too light adjustment, a weak spring, or disalignment of the clutch members. In cone clutches slipping may be induced by worn facing, oily friction surfaces, or burned cork inserts. In a multiple disk clutch, slipping may be the result of excessive lubrication, or glazed disks. In dry disk clutches, the latter cause may obtain, the disks may be oily, the facing may be worn, or the cork inserts, if used, may be burned. In the case of an expanding ring or shoe, the slippage may result from a worn ring or shoe, excessive lubrication, or wear on the expanding elements. Slipping in all clutches will result if the clutch pedal is allowed to strike the foot board on its back stroke.

6—No.

CENTER CYLINDERS CARBONIZE

Agricola, Kas.—What causes the two center cylinders in my four-cylinder Overland to carbonize and foul worse than the other two, which give no trouble? If I keep the valves soaked with kerosene or some carbon remover, they work without missing. Why does the carbon pick on the two center cylinders, without bothering the others?—A Reader.

As you do not state what year's model your Overland is, it is hard to say how to proceed to provide the proper lubrication. If the mechanical oiler is used, however, it will only be necessary to cut down the oil in the individual leads to the cylinders that give the trouble. If the splash system is used, the spoons on the connecting rods should be filed off until the oil is cut down to the proper amount. It may be necessary to even cut them off altogether. If the proper body of oil is used, this should not be necessary, if the pistons and rings are tight. If new rings are fitted and holes drilled in the piston walls, below them, to facilitate the return of surplus oil, the engine will not burn so much oil, and carbonizing will cease. As all four cylinders splash their oil from the same level, the fact that only the center cylinders receive a surplus of lubrication, indicates that these two are allowing too much oil to slip past their pistons sometimes.

STEAMER CANNOT BE CONVERTED

Lewis, Kans.—Editor Motor Age—I have a White steam car, model 00, 1910, with body and chassis all in fine shape. I have been thinking of putting in a gas engine. In doing this it will be necessary to change the differential or get a gas engine that turns the opposite direction to the gas car. I would appreciate your advice on the subject.—J. F. Malin.

It is impracticable to convert a White steamer into a gasoline car. The engine is a left-handed, or anti-clockwise type,

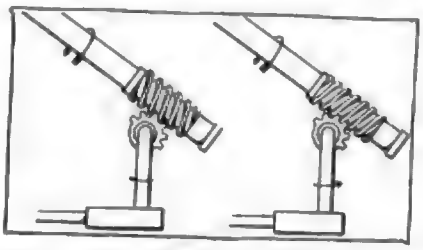


FIG. 3—HOW REVERSAL OF DIRECTION OF THREAD AFFECTS STEERING

which renders the rear axle useless with any standard right-hand gas engine. The engine mountings are so different from the mountings for a gas engine, that the frame would have to be altered in this respect, and to accommodate a gear-set and clutch. The White condenser could not be used for a radiator, which necessitates the purchase of this additional expensive part. The parts discarded would be pure waste, as there is no market for them. The expense of adapting this car to a gas engine would be greater than the purchase price of a lighter and better adapted car than the product of your efforts would produce. If the car is in good condition, run it as a steamer, or sell it, or trade it in, to assist you in the purchase of a gas car, if you prefer not to attempt the operation of a steamer.

Steering of Rear Wheels

Georgian Draws Wrong Conclusions Concerning Control of Christie Racer

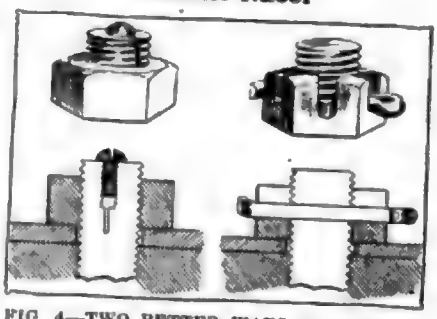


FIG. 4—TWO BETTER WAYS OF LOCKING NUTS

ATLANTA, Ga.—Editor Motor Age—If I am not mistaken Motor Age made a mistake in its answer to J. H. Strickler's fifth question in the September 12 issue. The question was whether or not the Overland Motor Car Co. ever marketed a six-cylinder car. Motor Age's answer was "No." I should like to correct this by saying that in 1908 the Overland people put out three models, namely, models 30, 31 and 34. The first two were fours, while the latter was known as the Willys-Six Overland. I do not remember the exact dimensions, but I think the cylinders were 4 by 4½ inches with three-speed selective transmission, and leather-faced cone clutch.

2—What are the dimensions of the new Blitzen Benz, variously called Blitzen II and Jumbo Benz?

3—In an argument over the big Christie racer I have contended that inasmuch as the car is steered by the rear wheels, the steering wheel must be turned in the opposite direction from the desired direction of travel; that is, in making a right turn the steering wheel is turned to the left and vice versa. Am I right?—J. N. Brightwell.

1—On inquiry, Motor Age finds the above statement is true in part. In 1909 about 100 sixes were built by the Overland company under the name of the Willys six. These cars had cylinders 4 inches by 4½ inches, and used a thermo-syphon cooling system. The wheelbase of this car was 125 inches, and the tires were 36 by 4½ inches. A multiple-disk clutch was used, and an option of a planetary or sliding gear gearset was offered. The body types were a five-passenger tourist, a four-passenger, and a two-passenger roadster. They were marketed as an experiment, and were discontinued because the market was not ripe for them. It is rumored that the manufacture of sixes is to be undertaken again by the Willys-Overland Co.

2—Blitzen Benz, Lightning Benz, Jumbo Benz, etc., are names applied to separate and distinct cars. Blitzen Benz is the car that Burman used in his famous 141-mile-an-hour ride. Lightning Benz is Oldfield's car and Jumbo Benz and Blitzen

II. are still other cars. The motor of Blitzen Benz is 7.2835 by 7.8741 inches, while that of Jumbo Benz is 7¾ by 9¾.

3—There are no grounds for your contention, as a steering gear may be so threaded or linked as to act upon its connections either way, when turned in a given direction. In Figs. 3 and 4 is shown how this may be done.

DISPLACEMENT OF LITTLE CARS

Sherrard, Ill.—Editor Motor Age—What is meant by piston displacement? If the bore and stroke of a motor are taken into consideration, how can the piston displacement be 154.8 for the Flanders, as figured in Motor Age, issue of January 4, 1912, while the Krit, with larger cylinders, is figured at only 132.7?

2—In fixed spark ignition, as practiced on a number of cars, is there any system used of advancing the spark automatically, or does the fact that at higher speeds, a fatter spark alone, solve the problem?—C. E. and A. G. Peterson.

1—Piston displacement is the volume displaced by the cylinder in its stroke. It is found by multiplying the piston area by the stroke. The piston displacement given for the Krit car in the issue of which you speak is wrong, it should be 176.7 cubic inches. The displacement for the Flanders is correct.

2—The term fixed spark means exactly what it implies, although there are non-adjustable spark systems that automatically advance the spark. In fixed spark systems, the spark occurs usually at dead center, and remains there at all times. The relatively greater intensity of the current at high speeds reduces the lag in ignition, and thus brings the actual ignition nearer the timing at high speeds than at low speeds. Of course a fixed spark system never permits of actual advance, and is used only where the greater efficiency and economy of the adjustable spark or automatic spark is not deemed necessary, or where the skill of the operator is not great enough to warrant the use of an adjustable spark. The terms non-adjustable and fixed as applied to spark systems should not be confused, the one is a negative term that embraces both fixed and automatic-advance systems, while the latter applies only to systems wherein the timing is constant.

DISBROW'S JUGGERNAUT DISSECTED

Carrollton, Ill.—Editor Motor Age—Is the motor in Disbrow's Simplex Zip a two or a four-cycle?

2—Was Disbrow's Jay-Eye-See constructed by the J. I. Case Threshing Machine Co., Racine, Wis?

3—What are the specifications of the Jay-Eye-See motor?—A Reader.

1—The motor is a four-cycle Fiat.

2—No.

3—9¾ inches bore by 8¾ inches stroke, four cylinders, cast in pairs with valves in the head, Rayfield carburetor, Bosch double ignition, force feed lubrication, and water cooled.

Differential Bolts Loosen

Native Son Finds That Vibration Loosens Nuts on Car's Axle Housing

LOS ANGELES, Cal.—Editor Motor Age—I have a 1910 Chalmers which has given me most perfect service except for one point, and that is the trouble I have in keeping the bolts tight which hold down the cap over the differential gears. I have used the largest lock washers obtainable, using plain washers with them as well, and have inquired of other Chalmers owners, but to no avail. What is the cause of this?—A Constant Reader.

The loosening of the nuts on the differential housing is not unusual in any car, as the vibration on the heavy unsprung portions of a vehicle is always severe and is aggravated by worn threads or an ill-fitting cover. There are several ways in which nuts may be locked securely. Manufacturers sometimes make provision of this kind by either wiring the nuts on, using castellated nuts and cotters, or fitting double or lock nuts.

In case there is not sufficient thread projecting above the nut to accommodate an additional lock nut, the nut may be sawed in half with a hack-saw, and the parts screwed on again, the lower nut being drawn up as tightly as possible, and the upper afterwards drawn down over it.

Another simple way in which a nut may be locked, without removing it from the bolt is to drill a hole through it and the center of the bolt, inserting and spreading a cotter-pin. This and the first method are shown in Fig. 1. These methods do very well for some cases, the former being satisfactory where no great strain is to be imposed on the nuts, as in your case. The second is well enough where the job is to be permanent, but if the nut is to be removed again, the chances are that the holes will not register properly on applying the nut again, and there also is danger of mixing the nuts of different bolts, thereby bringing the holes wrong altogether, as it is unlikely that any pair of hand-drilled holes would be similar to one another.

Two other methods, more complicated, but not possessing these drawbacks, are shown in Fig. 4. The first is not as difficult as it appears. The bolt is sawed down as shown past the lowest thread in contact with the nut, and tapped a trifle undersize for a standard size round or filister-head machine screw, the edges of the slot being dressed off with a file. The nut is then screwed down and the screw turned down in the threaded slot. This will expand the bolt, and lock the nut. The last method, and by far the simplest and best, may or may not be adaptable to your case. This consists of using a cotter and castellated nut instead of the plain one and involves only the drilling of the bolt. A handy mechanic can, of course, castellate a plain nut, if you cannot obtain a castellated one of the right size.

OLDSMOBILE ADJUSTMENTS

Chatham, Ontario, Can.—Editor Motor Age—I have an Oldsmobile Special touring car, 1910 model, and it has a pressure fuel system, but the gasoline tank is under the front seat. Why is the pressure system necessary?

2—Sometimes, when driving this car, there is a very strong smell of gasoline. I cannot find any leak. Where does this odor come from?

3—How can I adjust the coil on this machine so that the motor will start when I crank? As it is now, I have to crank the motor two or three times, then go around and press the button on the coil before I can get a spark in the cylinders. It is a Bosch magneto coil.

4—Will you please tell the best way to adjust the carbureter on the car, also the steering gear?

5—Could I use a KW. low-tension magneto for electric lights? How many and what candle power, if I use only for lights?—Bill.

1—Pressure was installed in the fuel line of some Oldsmobile Specials to enable them to use a certain carbureter which required more pressure than the gravity feed could give.

2—If you are sure that there is no leak

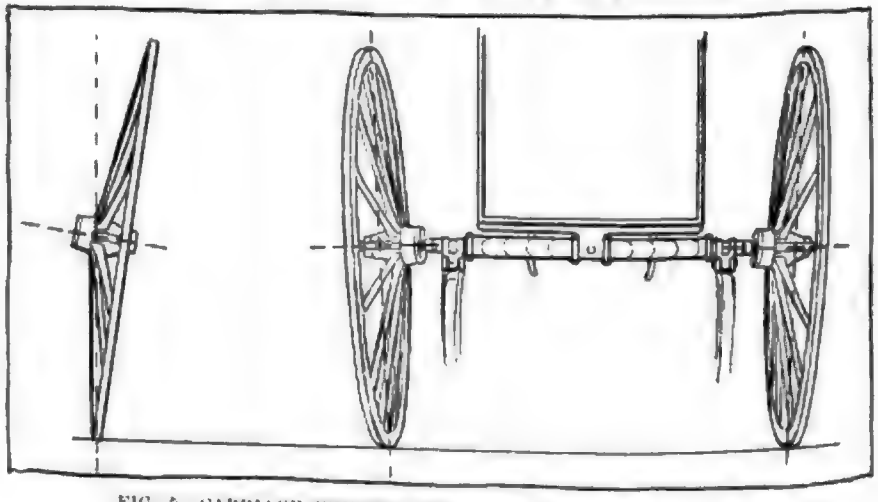


FIG. 5—CARRIAGE WHEELS WITH DISH, CAMBER AND GATHER

the gasoline smell of which you speak must be the result of an over-rich mixture.

3—The Bosch magneto coil used on this model is the old-style upright type, and has a vibrator on top. If you are sure that your batteries deliver consistently 6 volts, this must be out of adjustment.

4—The regular Oldsmobile carbureter is adjusted mainly by means of a gasoline adjustment at the right of the body. This should be turned all the way to the right, which cuts off the gasoline supply, then turned back two and a half turns. The motor should then start, after which, with the spark retarded and the throttle down, it should be turned to the left or right, as conditions require, as experiment will determine, until the motor ceases to spit. The air is adjusted in the usual manner, by means of the nut below the air inlet, directly below the valve. If a Rayfield is used, reference should be made to the Readers Clearing House in Motor Age, August 1, 1912, or to a special article which appeared in the issue of Motor Age May 23, 1912.

5—The K-W model UL magneto, which is usually used for lighting, will furnish enough current for two 20 candle-power head lights, and a small tail lamp, in addition to ignition. If no current is used for ignition, this current would probably be sufficient for two side lamps in addition to this.

FORD GEAR RATIOS

Ankeny, Iowa—Editor Motor Age—Will Motor Age please tell me the gear ratio of the Ford model T, on both speeds and reverse?

2—Is it true that the Krit is what was formerly known as the Columbia?

3—What are the Ford specifications for 1913?—R. W. Taylor.

1—3 7-11 to 1 on high, 7 to 1 on low, and 11 to 1 on reverse.

2—No. The Columbia is made by another concern and is one of the oldest makes in the country.

3—The Ford Motor Co.'s model or models for 1913 have not been announced. The Ford company is not an advocate of yearly models.

Carpenter on Steering

Minnesota Expert, After Experience With All Types, Favors Non-Irreversible Form

SAUK CENTER, MINN.—Editor Motor Age—I have used the styles of steering gears of which I am going to write, and am pleased to note that the one mentioned first has proven to me in a hundred ways to be the best of the three types mentioned. The reversible, semi-reversible and the irreversible are the ones in the most general use, and the semi-reversible is the most common.

The reversible is my choice, for the reasons I am sure will be clear to the motorist who never has given the subject a single thought, but whose very life depends to a very great degree upon the strength and ease of operation of this most important part of a motor car. The reversible gear is so arranged and constructed that it may be easily turned from the steering wheel, and when you take hold of one of the front wheels you can easily turn the steering wheel by either pulling or pushing on the wheel. The semi-reversible is nearly like the irreversible, and need not be mentioned in connection herewith. It is seldom specified, but often used.

The irreversible is an arrangement with bevel and worm-cut gears so arranged that in order to turn the course of the car from a straight line ahead one must exert a considerable power upon the steering wheel, in order that the car may turn as desired, and at the same time it is much slower in action than the reversible gear. This makes steering upon a stony road or one rough with humps and bunches a great deal harder than with the less complicated reversible gear, and it is as easy to guide as eating strawberry short-cake, or ice cream, as our hired girl used to put it.

The slightest touch of the wheel is so very easily done that even with the present enclosed mudguards one is enabled to avoid the most minute obstruction which may be in the road, when one is setting the clip in good earnest. This is not possible with the heavy, complicated, awkward arrangement called irreversible, and one has but to turn to the bicycle to verify the easy touch given to the handlebar of this machine, as well as its relative, the motorcycle. Still, they are both ridden at times with hands off, so easy is it for the machine to keep a straight line ahead on good roads. Again, if one is on a rutty and badly cut up road, the reversible gear is far the best, as the tires will, so to speak, guide the car much easier and with less skinning off the sides than with the other gear, for the logical reason the tires are not held so tightly to the hard, dried sides of the ruts, but slightly give as the wheel is propelled forward, thereby reducing the grind on the soft rubber sides of the tires to the minimum. It is also an admitted fact that only with a reversible may the car tracks be followed.

As to safety, I feel certain that the quickness of the action of the reversible gear gives far greater chance to avoid a collision with another car or any obstruction which might be avoided by a quick turn of the wheel, which would not be possible with the slower moving gear. I notice that some of the leading builders have used the reversible gear from infancy to the present day, proving that their machines are on the job as to durability and ease of operation of this important part of their cars. Among these makers are some who build even the largest and heaviest cars.

Further, it is much easier to keep in order, and is most certain to outwear the more cumbersome gear, and the wheel can be kept tighter with less play at practically no expense, whereas the cut gears to be found on the irreversible type are often so badly worn that replacement at considerable cost must be had. I owned a heavy car which had the irreversible gear, and at first the gear was tight and but little play at the wheel, but shortly there was a noticeable looseness and hard steering that I did not like. There would be about 3 or 4 inches that one could turn the wheel before it affected the front wheels in the least, which made steering tiresome, and unsafe, as well. Such lost motion rarely develops in a reversible gear.

In the car I now own I keep the steering wheel just so it does not bind, and there is scarcely a particle of play to it. This makes driving an easy matter, as well as a real pleasure. But more than anything else, it makes steering safe.

The adjustability of the reversible gear is what commends it to me, and the easy manner in which wear, when it occurs—which is very seldom—may be taken up, and at no cost whatever except time. Now, like the magneto discussion, let us have the man behind the irreversible gear come forward and explain why it is better than the reversible type.—A. D. Carpenter.

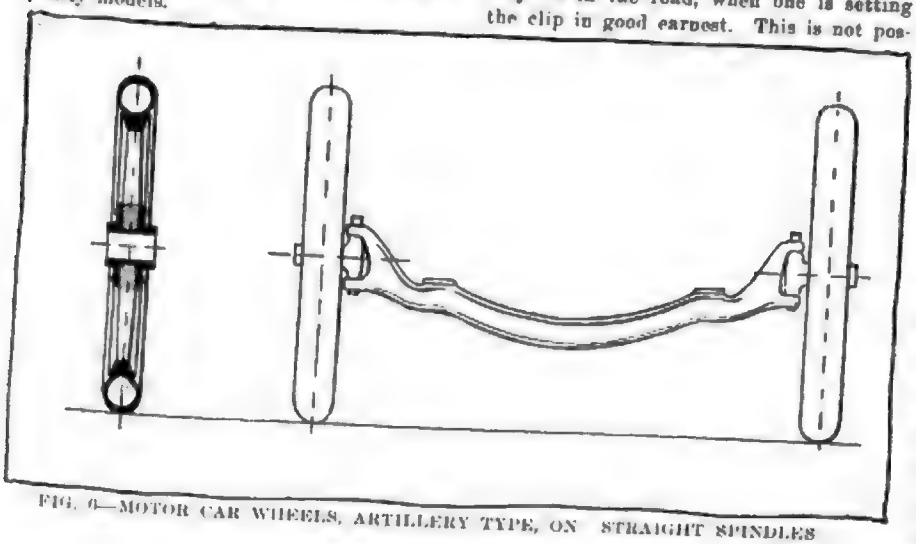


FIG. 6—MOTOR CAR WHEELS, ARTILLERY TYPE, ON STRAIGHT SPINDLES

The Realm of the

Alco Finishes Transcontinental Run

Trip from Coast to Coast Ends in Los Angeles on September 20

PIERCE-ARROW TRUCK EQUIPPED FOR ARMY MANEUVERS

GREETED by a salute as it entered the city, escorted by a cordon of motor trucks and a platoon of police, and welcomed at the city hall by public officials, the transcontinental Alco truck that has made the first trip on record in actual commercial service arrived in San Francisco September 20 with its cargo from Philadelphia. The truck averaged 45.21 miles per day for 90 days, no deductions being made for Sundays, when it did not run as a rule.

The arrival marked the culmination of a journey that started June 20 from the factory of the owners, Charles W. Young & Co., soap manufacturers of Philadelphia. The vehicle was taken out of its regular daily service, and, laden with a 3-ton consignment for the Carlson Currier Co. silk mills, set out June 20 on its coast to coast journey.

A delivery of 4,069 miles, this trip through fifteen states was fraught with many thrills from the time the truck struck heavy sands in Ohio until it crossed the highest point of the Sierras, and journeyed down the roads of California.

At times the vehicle ran over boulevarded highways. At others it encountered snow storms, cloudbursts, broken bridges and steep grades reaching as much as 20 per cent. It was forced often to pull through sandy roads 2 feet at times and through alkali mud up to its hubs. On occasions it followed trails that were merely deep ruts with high ground between. Sometimes there were no trails at all when the truck made detours from the beaten path.

Departing from Philadelphia, after heading a parade in which more than 500 vehicles joined, the truck checked in at New York the first night of its overland journey, and continued through the state by way of Albany, Schnectady, Utica, Syracuse, Rochester and Buffalo; thence across northern Pennsylvania by way of Erie into Cleveland.

The route from here led to Toledo, where the first experiences with roads in deep sand were met. Rains the following day on the way to Edgerton, O., turned the going into mud. Across western Illinois, beyond Chicago, the Alco ran into roads of gumbo that wrapped around the wheels and gave tests to the truck's pulling power. Many sharp grades had to be climbed in reaching Clinton, Ia.

The journey across Iowa by way of Boone and Arion was accompanied by many thrilling experiences with bridges, which were the weakest in any state traversed. Several gave way, and in 3 days at least 500 were inspected by the crew; 100 were replanked, braced or given other attention.

Conditions in Nebraska were ideal by comparison with what the truck had just pulled through, the roads being better and the bridges stronger. Most of the way across the state the crew were guests of various road boosting associations.

Near Sterling, Colo., the vehicle was engulfed in a sea of alkali mud when the huge irrigation canal in that section of the country overflowed. Trapped for 27 hours, the crew were without food and cut off from communication with the world.

Even worse experiences were the almost daily program across Wyoming, which proved by far the most difficult in negotiating. In 8 days there were ten cloudbursts in one section and the roads at best were merely trails too narrow for the truck. There were some gullies as deep as 14 feet, which the truck was forced to cross.

PIERCE PREPARING TO CROSS RE-INFORCED BRIDGE

mercial Car

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ITINERARY OF PIERCE-ARROW MILITARY TRUCK

BUFFALO TO NEW HAVEN

Date and Place	Miles	Time, hours, including all stops	Miles per hour	Gallons of gasoline put in tank	Cost of gasoline	Quarts of oil	Cost of oil	Total cost	Average load	Loads carried, approximate
Aug. 4—Buffalo to Rochester	80	8.75	9.14	20.5	3.80	..	....	3.80	7,776	.....
Aug. 5—Rochester to Syracuse	102	14.5	7.03	24.	3.60	6	.90	4.50	8,000	.....
Aug. 6—Syracuse to Albany	147	17.5	8.40	32.	5.40	..	....	5.40	8,000	.....
Aug. 7—Albany to Lee, Mass.	48	8.25	5.82	5.	.75	1	.13	.88	8,000	.....
Aug. 8—Lee to New Haven	111	14.75	7.53	24.	3.60	3	.36	3.96	8,000	.....
Total for 5 days	488	63.75	7.6	105.5	17.15	10	1.39	18.54	7,975	.....
Miles per gallon, 4.63										
WAR MANEUVERS										
Aug. 9—Tyler City	12	....	....	....	....	..	....	....	8,000	.....
Aug. 10—New Haven to Tyler City	23	....	....	....	....	..	....	....	6,000	.....
Aug. 11—Tyler City to New Haven	21	....	....	13.	1.95	2	.25	2.20	8,000	.....
Aug. 12—Tyler City to Orange Center	20	....	....	....	....	..	....	....	6,000	12,000–1 4,000–2 2,000–3
Aug. 13—Orange Center to New Haven	23	....	....	15.	3.00	..	....	3.00	2,000	.....
Aug. 14—Orange Center to White Hills	32	....	....	10.	2.00	..	....	2.00	11,000	13,000–1 6,000–2 3,000–3
Aug. 15—New Haven to White Hills	38	....	....	12.	2.40	2	.25	2.65	2,000	Slight rain
Aug. 16—White Hills to Oxford	30	....	....	10.	2.00	..	....	2.00	14,000	.....
Aug. 17—White Hills	11	....	....	17.	3.40	..	....	3.40	14,000	.....
Aug. 18—White Hills to Botsford	14	....	....	....	....	..	....	....	5,000	Rain
Aug. 19—White Hills to Derby	8	....	....	12.	2.40	1	.13	2.53	2,000	Rain
Total for 11 days	232	....	....	89.	17.15	5	.63	17.78	6,635	.....
Miles per gallon, 2.6										
NEW HAVEN TO BUFFALO										
Aug. 20—White Hills to Springfield	79	10.	7.90	20.	3.00	6	.72	5.52	6,500	.....
Aug. 21—Albany	94	11.	8.54	12.5	1.88	..	....	1.88	6,500	.....
Aug. 22—Utica	97	10.25	9.46	30.5	4.73	3	.36	6.09	6,500	.....
Aug. 23—Auburn	80	9.	8.88	16.	3.20	..	....	3.20	6,500	.....
Aug. 24—Rochester	71	8.	8.88	18.	3.60	..	....	3.60	6,500	.....
Aug. 25—Buffalo	87	8.	10.88	19.	2.85	3	.36	3.21	6,500	.....
	508	56	9.03	115.0	19.26	12	1.44	22.50	6,500	.....
Miles per gallon, 4.42										

Gasoline	$19.26
Oil	1.44
Grease	1.80
Total	$22.50

TOTAL

Buffalo to New Haven	488	....	....	105.5	17.15	10	1.39	18.54	8,000	.....
War maneuvers	232	....	....	89.	17.15	5	.63	17.78	6,635	.....
New Haven to Buffalo	508	....	....	115.	19.26	12	1.44	22.50	6,500	.....
Grand total	1,228	....	....	309.5	53.56	27	3.46	58.82	7,045	.....

Miles per gallon, 3.97

SUMMARY OF RESULTS AND NOTES

Number of days in service	22
Average load carried (daily), pounds	7,045
Total distance covered, miles	1,228
Average daily mileage, miles	55.8
Gasoline consumed (gallons)	309
Miles per gallon gasoline	3.97
Oil consumed (27 quarts)	6.75
Miles per gallon oil	182

During the actual maneuvers back roads were used almost exclusively by the truck. It was known before the truck left the factory at Buffalo that difficulties would be met with because of the nature of the roads that would be used necessarily and special provision was made for overcoming these difficulties. The Pierce-Arrow truck, then, may be said to have gone into the maneuvers prepared for army field work in so far as foresight and engineering experience could equip them.

Most valuable of the extra equipment of the truck were four heavy planks 14 feet long, 12 inches wide and 2 inches thick. Two of these were carried on each side of the truck and there was not a day the truck was on the road that they were not used. Bad culverts were crossed with their aid and they were laid frequently across weak bridges to distribute the strain that would ordinarily fall on a few floor boards and one set of stringers. On one occasion these boards were used by the whole army train of a dozen trucks.

On the left side of the truck a winch was mounted, connecting with the shaft running between the clutch and transmission. The winch was used on two occasions, but then more as a test of its adaptability than as a means of propulsion.

Mounted on the dash was a searchlight. This it was expected would be employed altogether in lighting the road for night running, but on the first day of the maneuvers another use was found for it. During the unloading of the truck at night on the field the men had been forced, at other times, to work with one hand and arm, using the other arm for holding a lantern. With the searchlight turned around to bear on the load, however, the men could use both arms for the work. A spare wheel was carried under the rear of the body.

Numerous lessons were drawn from the use of trucks in the recent maneuvers, the most important of which was that the efficiency of the motor truck suffers to such an extent when driven in any army train with mule-drawn wagons as to render it of little more value than its equivalent in carrying capacity in wagons. Where entrained with the wagons, as was considered necessary in order to keep the entire supply train intact and under one guard, the better to resist attack by the enemy, the trucks were forced to limit their speed to that of the mule-drawn wagons. While on the road in train formation stops were frequent and owing to the narrow roads in the country traversed as well as to the train formation it was impracticable for one portion of the train to pass another.

Bridges and culverts, especially on the back roads, were not built to withstand motor truck passage, it soon was observed. At times it was necessary to remove all or a part of the load before a passage could be attempted, while on numerous occasions the planks that were carried were spread across the floor in order to distribute the weight. However, even planks proved inadequate on 1 day's march when a sunken culvert that had been covered over with loose dirt and gravel gave way and the truck sank down on one side to the level of the platform body. There had been no warning sign on the road. As soon as the load was off a score of soldiers who had been on the truck and in the escort ranged themselves on one side of the vehicle and lifted it bodily so the planks could be placed under the wheels and it then proceeded without further incident. The strain undergone in this accident must have been a tremendous one, but no damage was done.

Army trucks to be successful must be especially equipped for their work, as was shown conclusively. Planks are an absolute necessity. In addition to those carried by the Pierce-Arrow truck there could have been used two others 4 feet long, 12 inches wide and 2 inches thick for bridging short spaces. Among the other recommendations made by an observer were these:

A winch so situated that it may be worked through snatch blocks in any direction.

Strong eye bolts for carrying snatch blocks for the winch line.

Two jacks that are quick acting and with a step that is near the ground. An even better plan is a tripod carrying a long extension lever to use for prying.

A draw bar that carries an eyebolt or coupling that would prevent wear or cutting of the cable used.

A swivel type searchlight.

Shovels and axes so placed that they are not in the way of the load, but where they are accessible for instant use, no matter what position the truck may be thrown.

A double block and tackle with 100 feet of rope.

The actual trip started August 3 with the loading of the truck at headquarters at Buffalo. The Albany armory was reached at 11 a. m., August 6. The return trip after the hard siege of army work was begun August 20, Buffalo being reached at 5:30 on August 25. The work accomplished by the machine is shown in the tabulated results on page 31.

Determining Efficiency Standards of Motor Trucks

By R. W. Hutchinson, Jr., M. E.

NOT an inconsiderable number of motor truck salesmen endeavor to introduce motor transportation by tirades against the horse, forgetting that the horse as a horse is not at fault at all; that he, the horse, is not the cause, but the victim of our changed economic conditions. These superficial promoters of mechanical transportation do not seem to grasp the broader viewpoint in the solution of these problems. This is due in a large measure to the fact that the business world has gotten into the habit of gauging motor truck efficiency and performance by horse-service standards; in comparison with the effectiveness, service, capacity and cost of the horse.

Habit is a basis for most of our methods of doing things, and is too often the wet blanket that smothers the spark of human progress. Today one of the greatest hinderances to the rapid development of the utilization of the motor truck is the prevalence of the horse standard that has been so firmly fixed in the human mind by heredity's influence. This influence is widely responsible for the prevailing skepticism of the business public towards the motor truck.

As a consequence of unfair horse comparisons, it is harder for the manufacturer to sell power trucks, and it restricts the user to a traditional line of judgment of efficiency ideals which are in most cases incongruous. Both parties are thus losers, as is also the development of the truck. The short-sightedness of dealers who adopt this line of sales policy is thus apparent. The horse standard of efficiency also accounts for much of the false figures of transportation costs and also for seven-eighths of so-called truck failures, which in reality are not truck failures at all but misapplications.

If the horse never had been used by the human race to draw vehicles, the motor truck would now be taken at its true value, and its maker and the man who is, or ought to be using motor transportation, would be a great deal better off in being able to get closer together, in recognition of their mutuality of interests—their interdependence in the scheme of advancing civilization.

Unprejudiced fairness to the motor truck demands recognition of the fact that the service it does is not comparable with horse service, primarily by the maker and necessarily by the user.

Granting that in average service, one high grade motor truck will displace four teams, the impression must not be conveyed that it does its work in the horse way, so that the comparison does not strictly obtain. While it renders the same service, it does it in a different and better way—faster, surer, independent of weather extremes, without fatigue, regardless of hours of rest and feed, free from bad temper, occupying less space in the streets, docks, terminals, and in the owner's garage; doing cleaner work, permitting the employment of more skilled and efficient labor, permitting those whose work depends indirectly upon the work of the

transportation means to work to their full capacity, and has almost unlimited capacity for overtime work. It can be taken off the job when the season is dull, with no other cost than the small fixed charges and storage, and again, in both theory and practice, the motor truck never dies. It can be renewed when worn out, and when consistently and intelligently repaired and kept in proper adjustment, can be kept always at a point of maximum running efficiency, so that in truth, a motor truck never need be allowed to even age.

Furthermore the motor truck can deliver goods to restricted places, alleys, docks, platforms, etc., and unload with its own power, where horse deliveries must be confined to places where the horse can go, with loads restricted to the capabilities of the horse, and the unloading done by slow and expensive hand labor. Even a light-duty motor truck will carry as many as four horses, with only one man in charge of it, and with the aid of the readily adaptable power of the motor, can unload more rapidly than can a horse and wagon attended by never fewer than two men.

The Pittsburgh Contracting Co., one of the builders of the great New York aqueduct, is using auxilliary loading and unloading devices, a crane and a derrick, to assist its 6½-ton truck, thus conserving the waste time of unloading and loading by hand. In comparison with horse equipment its economies, due to thus taking advantage of the functions of the motor truck as a power plant outside of its purely carrying capacity, aggregate over 63.75 per cent as the detailed cost in the table data clearly shows. These figures, however, give only a partial idea of the actual economy effected by its use.

Owing to the greatly increased speed of both transportation and handling of the load less time, of both the driver and those whose work depends upon his, is wasted; owing to the absence of fatigue of the truck, this equipment can work more hours per day than is shown in the table, with an actual saving in operating cost; the quality of help is inevitably higher, where the driver is required to have a technical training, a clear head and must work to full pressure to keep up with his mount, than where a strong back and lusty lungs are the chief requisite as with the horse driver; the reliability is greatly increased, the truck offering absolute immunity to weather conditions, except as they may affect traction; and the general benefit to traffic at large accruing as a result of greater speed and less consumption of traffic room; these results cannot be measured by horse standards, and constitute indispensable requisites to a fair consideration on a higher plane of consideration than merely the narrow difference in operating cost between the truck and horse equipment in similar service.

As a traction element, the efficiency of the horse is limited strictly to the drawing of the load. The traction and carrying capacity of the vehicle only partially represent the capabilities of the motor truck. To bring out the efficiency ideal of the motor truck still further, we must think of the easy adaption of the motor truck to the operation of power winches, cranes, and even taking the crane over a wide distributing area. The power winch equipped truck applies the power which propels the truck to load and unload. The self-same engine that operates these devices also may be applied to a dynamo to drive stationary tools in the shop, the engine's exhaust may be used to warm the truck, to make the driver more comfortable, or prevent the freezing of perishable goods; or in a reverse manner, to operate a refrigeration plant, to protect perishable commodities from spoiling in hot weather.

These subsidiary and constantly increasing and diversifying uses for the motor's power represent quality of service and character of work, for which the horse is useless. The machine performs a class of service in many respects which cannot possibly be done with a horse, and consequently ought not to be judged by horse units.

It must be confessed that today the average motor truck goes into service under horse-pace standards in the smallest details. Its owner, regarding it in the light of horse ideals puts it to work distributing his goods over routes adjusted to horse capacity, thinking of it purely as a substitute for a horse team. He loads it from a platform or a warehouse designed solely for the limitations of the horse team. He unloads it after it has waited its turn for perhaps an hour at a similarly misfit delivery place. The aggregate of its off duty or stationary periods runs into hours per day and when capitalized on its initial cost of $3,500 as an average represents the dividend earning capacity of the power vehicle, wasted opportunities spell truck failures, so called. Efficiency engineers are daily showing that many of these truck failures are the fault of the owner and not the truck by throwing aside all horse traditions and re-organizing the operating system completely, producing economies afterwards that astound the owners.

The great and fundamental cause of truck failures is the fact that truck users forget that the machine is one of the biggest potential tools for the efficiency in business that the twentieth century has so far given us, and that a new regime must be put into force when he adopts it; and that this regime demands the highest order of systematizing and reorganizing ability for the entire delivery system—inside and outside as well. Grounded deeply in horse traditions, probably but one master of transportation or delivery superintendent in twenty-five is capable of handling such a reorganizing problem. A transportation doctor's services are needed at the start to so plan the system within and without that the modern mechanical wagon can be kept constantly at work.

So far as planning the without part of the new system goes it is the office of the truck manufacturer to supply the education of his customer through his traffic department or efficiency doctors. The within part of the system must come as a process of evolution which motor transportation is bringing. Existing buildings must be altered to facilitate motor truck delivery. Doors must be sufficiently large to allow the entrance and exit of the largest trucks with inclosed bodies; courtways must be equipped with turn tables, traveling belts, movable platforms, slides, chutes and other modern efficiency apparatus for quickly putting the load on and off must be utilized before the potential possibilities of motor transportation can be developed. Even the new highway and street must come.

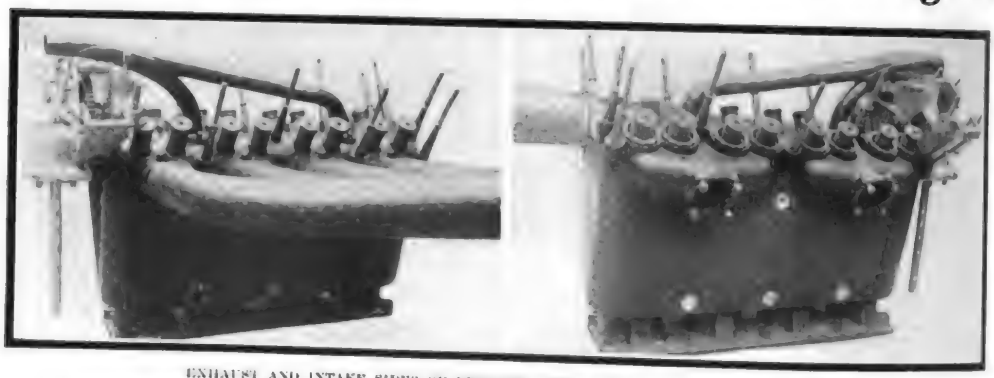
ECONOMY SECURED BY PITTSBURGHERS THROUGH USE OF TRUCKS

This is an efficiency example from Pittsburgh.

The material is excavated from Aqueduct tunnel and the time of loading and unloading is 3 minutes. The material is dumped into bins and then to buckets by chutes at the shaft mouth. At the dumping ground the bucket is hoisted off the truck and dumped.

CONDITIONS—	
300 days per year.	50 miles per day.
15,000 miles per year.	3½ yards per trip in single bucket.
	42 yards per day of eight hours.
INVESTMENT—	
6½-ton chassis	$6,000.00
Special platform body	300.00
	$6,300.00
FIXED CHARGES—	
Interest on $6,300 at 6%	$ 378.00
Insurance, liability to persons	75.00
Depreciation not figured	
Driver at $21 per week	1,092.00
Garage at $17.50 per month	210.00
	$1,755.00
OPERATING CHARGES—	
Maintenance at 4 cents a mile	$ 600.00
Gasoline at 2.4 cents, at 5 miles to a gal.	360.00
Tires at 5.5 cents, 8,000 miles guarantee	825.00
Oil and grease, at 1 cent per mile	150.00
Total cost per annum	$3,690.00
Total cost per day	12.30
Total cost per yard	0.292
Total cost per mile	0.256
With horse teams it cost 80c per yard to haul this material.	

Constructional Features of the Peugeot



EXHAUST AND INTAKE SIDES OF PEUGEOT MOTOR WITH CAMSHAFTS REMOVED

WITH Dieppe, Le Mans, Mont Ventoux and Boulogne as evidence, the Peugeot racer undoubtedly is the finest pure speed production France ever has possessed. Built under no limitation regulations, the car is distinctive as a specimen of light-weight high efficiency type developed of recent years in Europe.

Its four cylinders measure only 4.3 by 7.8 inches, from which it has been possible to get 175 horsepower on bench tests; the maximum speed of the car is about 120 miles an hour; its total weight empty is 2,000 pounds; and although shaft-driven it holds to the road better than the majority of chain-driven racers.

The car is largely the production of Georges Boillot, the Peugeot race driver, and his companions, Goux and Zuccarelli; with their experience in light-car races, they determined the distinctive features of the big car and were responsible for many of the interesting details which go far towards the making or the marring of a speed production. Shaft drive was decided on after lengthy experience with both types of final drive, Peugeot having at first been a partisan of side chains for racing, and later coming over to the shaft for all models.

Light Weight a Factor

The importance of restricted weight and perfect adherence to the road was manifest at the Dieppe grand prix. It undoubtedly was owing to the lower tire consumption consequent on the lower weight that the car with half the cylinder area was able to beat the Fiats in this long-distance event. At maximum speeds the Peugeot appeared to stick to the road better, and was probably easier to handle than Bruce-Brown's Fiat, although it would be impossible to offer much criticism at the Fiats on this particular score. The entire Peugeot power plant is carried on a three-point suspended subframe having the form of an elongated U, the curve

Racing Drivers Credited with Improving the French Car Design

being at the fore end and having a central swinging attachment to a very substantial double transverse frame member. Both this and the two rear ball-and-socket attachments are provided with lubricators, the object of the design being to eliminate the power plant from all the twisting strains of the main frame members. The frame members themselves have not much that is distinctive: they have an upward curve in order to clear the back axle and are narrowed in front; the chassis is carried on very broad, flat springs, Fig. 1, and two stout leather bands encircle the rear axle and the rear transverse frame member in order to eliminate violent action of the springs.

The motor has its cylinders in one casting, is attached to the crank chamber by five bolts a side and has its valves inclined in the head at an angle of 45 degrees. There are four valves per cylinder, their diameter being 2.36 inches and their lift .43 inches. The normal speed of the motor is 2,200 revolutions, which gives a piston speed of 47 feet 10 inches. The valve design is a Peugeot patent, for although the inclined position of the valves is not unusual the method of operating them by means of independent overhead camshafts is altogether original. This position gives a hemispheric combustion chamber and allows the placing of the spark plug—one per cylinder—directly in the head. Each camshaft, with its pushrods and valve springs, is complete in an aluminum housing placed sufficiently high above the head of the cylinder to isolate it from the heat of

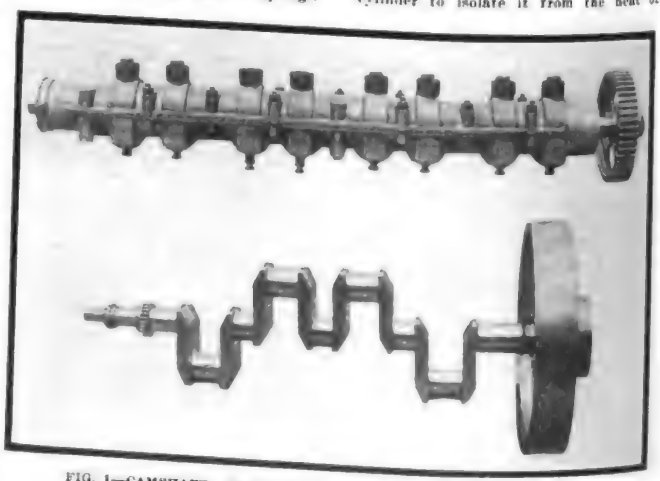


FIG. 1—CAMSHAFT. FIG. 2—CRANKSHAFT USED ON PEUGEOT RACER

this latter, and is carried on a series of seven long projecting bolts. The drive is obtained by a vertical spindle at the fore-end of the motor and inclosed gearing at the upper front end of the engine to the spur pinions on the end of each camshaft.

Profits by Racing Experience

Profiting by racing experience, the design of the valve is such that in case of a breakage it is impossible for the head to drop onto the piston. The camshafts, Fig 2, complete with their housing and pinion are mounted over the respective range of valve stems and can be lifted away by withdrawing a series of seven nuts. The exact nature of the valve-operating mechanism has not been revealed. Each shaft naturally carries eight cams operating within the interior of an eccentric having a pushrod without roller forming an integral part with the eccentric. The tappets have adjustable heads and are returned by light coil springs on top of the camshaft housing.

The crankshaft, Fig. 3, is carried on five plain bearings, and is of chrome nickle steel and is bored throughout for lubrication under an exceptionally high pressure. Steel pistons are used with hollow connecting rods, the weight of the reciprocating parts being kept as low as possible, the complete piston, with rings and wrist pin weighing only 32 ounces. The wrist pin is fixed in the connecting rod and is carried in bronze sleeves within the piston. The crankchamber, Fig. 4, divided horizontally into two portions and having the crankshaft carried in the lower portion, is provided with two large hand holes on each side for inspection of the connecting rod ends. The space between the top of the crankchamber and the base of the cylinder is filled up with the exception of the space necessary for the passage of the connecting rod, and in this guard plate a series of holes are drilled to allow of the return of the oil swept from the cylinder walls into the base chamber. The lower portion forming oil tank is deeply ribbed to assist in cooling the oil. A constant level is maintained and if this level should be exceeded a hand pump allows the mechanic to draw the excess out of the motor to the reserve tank.

A gear pump carried within a cylindrical housing and having a cone seating draws the oil from the base chamber, delivers it to the main bearings through the hollow crankshaft to the connecting rod ends, and up the tubular connecting rods to the wrist pins. All the oil leads are internal and are steel tubes brazed in the crankchamber, special care having

(Continued on Page 38.)

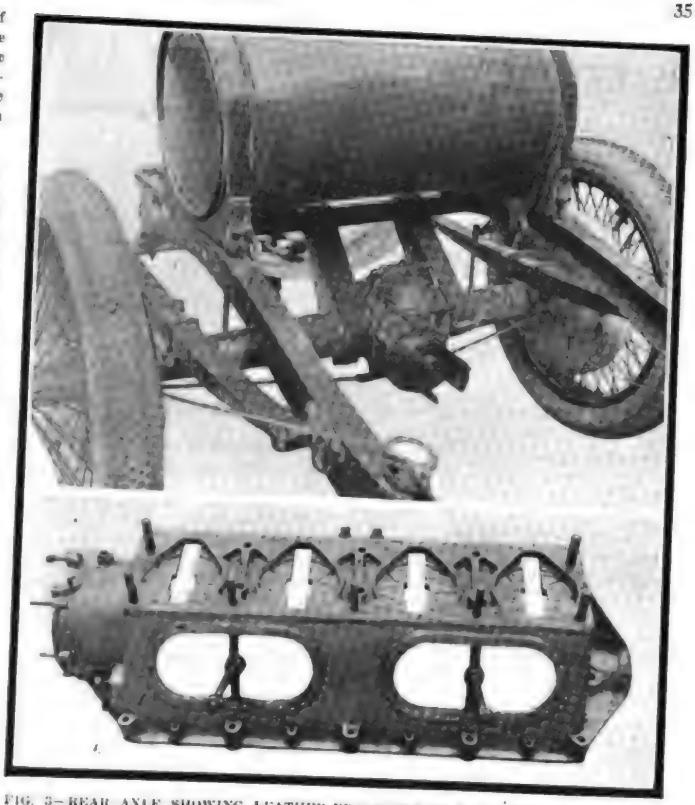


FIG. 3—REAR AXLE SHOWING LEATHER BRACELETS TO TRANSVERSE FRAME MEMBER. FIG. 4—UPPER HALF OF CRANK CHAMBER

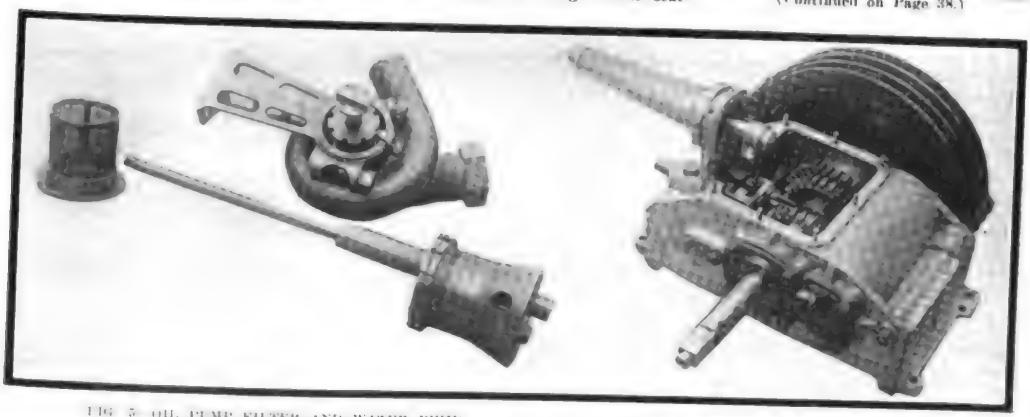


FIG. 5—OIL PUMP FILTER AND WATER PUMP

FIG. 6—PEUGEOT GEARBOX

Glide Features New Chassis for 1913

GLIDE 36-42 FIVE PASSENGER TOURING CAR

Bartholomew Brings Out New Four Embodying Many Interesting Features

REPLETE with new features and embodying several quite radical changes from former practice, the Glide for 1913 appears in the form of a development of last season's model 36.

The most notable changes are in the motor and transmission system. The new patterns of which are quite different from those of last season's models. The general dimensions of the chassis have undergone refinements in proportion and size. The new motor is cast in block instead of singly, as in former Glide practice; the valves are on the left instead of on the right, as formerly and completely inclosed to exclude dirt and water, to keep the engine cleaner than when these parts are exposed, and to decrease the noise produced thereby.

Many Radical Changes

The cylinder sizes have been modified somewhat in favor of a longer stroke, the bore having undergone a slight decrease and the stroke an increase. The rear axle this year is of the floating type instead of semi-floating and the gearset has been moved from the rear axle, where it has resided so long in Glide practice, to the orthodox position amidships, it being incorporated as a unit with the clutch and motor. Tire sizes have been reduced from the former 36 by 4½ sizes all around to 34 by 4 on all wheels. Left-hand drive and center control are features for the coming season with the additional equipment of electric lights supplied by dynamo and storage battery; a starter; an engine-driven tire pump, and full top, lamp, and windshield equipment.

The new car as a whole is better balanced, having a wheelbase of 118 inches, a tread of 56 with option of 60 inches for southern roads; instead of the former 120-inch wheelbase and the tread of 54½ inches. The tires are smaller and fitted on demountable rims. The frame has received a drop which renders the tonneau more comfortable and lowers the center of weight somewhat.

The Glide motor is of the L-head type, four cylinders and four-cycle, the cylinders, intake manifold and valve-rod housing being cast integral. The cylinders are 4⅛ by 5¼ on the new motor instead of 4½ by 5 as on the present model.

The position of the valves on the new motor is side by side, their entire mechanism being inclosed as shown in the sectional illustration. The valves have nickel-steel heads electrically welded to carbon steel stems and bearing upon hardened steel tappets, the valve springs, stems and tappets are readily accessible for inspection or adjustment by the removal of a cover plate. Steel pistons are used with H-section connecting rods. These are drop-forged from high carbon steel and heat-treated to withstand crystallization. The wrist-pin is held rigid and the bearing caps are retained by 3½ per cent nickel bolts secured by castellated and pinned nuts. The wrist-pin and crank bearings are of a special alloy of nickel babbit, fitted with steel shims to permit of taking up wear. The crankshaft is turned from a solid billet of high-carbon steel and is mounted on three bearings of nickel babbit supplied with steel liners to permit of adjustment and the take up of wear. The camshaft is of one piece with cams integral, hardened and ground.

FRONT VIEW OF 1913 GLIDE, SHOWING DASH LAMPS AND LEFT-HAND DRIVE AND RIVETLESS MUDGUARDS

The crankcase is of aluminum cast in two halves, the upper portion carrying all bearings, etc. The support arms are integral therewith, in the form of a sub-pan as shown in the end section of the motor and of very interesting design. The lower portion is secured to the upper by bolts and acts merely as an oil pan and may be dropped for inspection or adjustment of the internal parts. This bottom is fitted with oil drains and means for demounting the oil pumps. The flywheel casing which completely incloses this member and the clutch, is bolted integral to the engine base.

Two Oil Pumps

Lubrication is by a constant-level splash system using two pumps situated at opposite ends of the crankcase. This placing insures a constant supply of oil to each pump at any angle of gradient, assuring a positive circulation of oil. They are supplied with separate sight feeds on the dash and feed to the rear main bearing and to the timing gearcase through copper tubes, from whence the oil overflows into the crankcase where, by the splash system, it is used to lubricate the crank pins, wrist-pins and cylinders.

Designed for Silence

Timing gears are all helically cut to eliminate sound, and made of mild steel, while the idler gear is of cast iron, the difference in the hardness of the metals preventing wear and insuring long life without play. Cooling is by a centrifugal pump made of bronze, mounted on the right side of the motor in connection with a honeycomb radiator; which is cooled by a fan, driven by an adjustable belt.

Ignition is by the dual system, a Remy magneto being used in connection with a storage battery for starting. Carburetion is by means of a Stromberg single-jet non-water-jacketed carbureter.

The clutch of the new car is of the multiple-disk, dry-plate type, consisting of fourteen steel plates, each alternate plate faced with Raybestos. It is mounted on ball bearings with a ball thrust on the operating clevis. This thrust is in the form of an annular ball bearing, on an axis counter to the shaft. Former Glide clutches were without facing and operated in a bath of oil.

Design Differs from Former Practice

Old Custom Abandoned by Peoria Maker, Who Features Full Equipment

The gearset of the Glide in its new position amidships is of the three-speed selective type, bolted to a flange on the rear of the flywheel housing. It runs on Timken roller bearings. The gears are cut from chrome nickel steel, are of large diameter and run on nickel steel squared shafts. An automatic lock is used in the control to prevent the engagement of more than one speed at a time. A large hand hole is provided in the top of the casing for the filling of the gearset case with grease and for minor clutch adjusments. Access to the gearset is to be had through a removable cover. Drive is to the rear axle by a shaft with but one universal joint.

DASH ARRANGEMENTS OF NEW GLIDE CAR, SHOWING CONTROLS

Floating Axle New to Glide

The new axle is of the floating type of pressed steel. The axle shafts have the drive flange forged integral and carry no load other than the driving torque. The housing is substantially a single piece of pressed steel of $\frac{1}{16}$-inch gauge. The wheel carriers are of nickel steel tubing accurately ground to accommodate the wheel bearings and are expanded integrally to the housing proper. The differential is of the bevel-gear type, its bearings and the wheel bearings being of the annular-ball type. The brakes are mounted with the axle assembly with their operating shafts extending inside of the frame and forward of the axle out of sight and lending a clean appearance to the axle. The brakes are of the double-expanding type, completely inclosed and are 14 inches in diameter, being situated side by side and faced with non-burn lining. Propulsion is through a torsion tube inclosing the drive shaft.

The front axle is of I-beam section, forged in one piece from 35 per cent carbon steel, with exceptionally long spring seats. The wheel bearings are of the cup and cone type of standard dimensions, fitted with imported Hoffman balls. The outer bearings carry $\frac{5}{8}$-inch balls, the inner balls being $\frac{3}{4}$ inch in diameter. Steering connections are drop forged of high carbon steel and heat treated. The drag link is situated at the rear of the axle, where it is protected by the axle from injury. The axle is dropped between the spring seats which are of unusual length. This construction permits of rigid clamping of the springs to the axle. The front springs are half-elliptic, 36 inches long, and the rear springs are of the three-fourths scroll elliptic type, 46 inches in length. All spring shackle bolt eyes are supplied with reamed phorphor bronze bushings, the shackle pins being of hardened and ground steel with integral grease cups. The frame is of cold-drawn pressed steel of channel section, $3\frac{1}{4}$ inches deep, with a 2-inch drop under the rear door.

Steering is by irreversable worm-and-nut steering gear of the differentially-threaded double nut type. It is operated by a 13-inch walnut wheel from the left-hand side. The control is by means of spark and throttle levers on top of the steering wheel, a foot accelerator between the clutch and brake pedals, and the gear-shift and emergency brake levers in the center. The cutout is operated by the right heel.

GLIDE MOTOR, SHOWING GENERATOR, G; MAGNETO, M; WATER PUMP, P; AND AIR PUMP, A

Neat Dash Arrangement

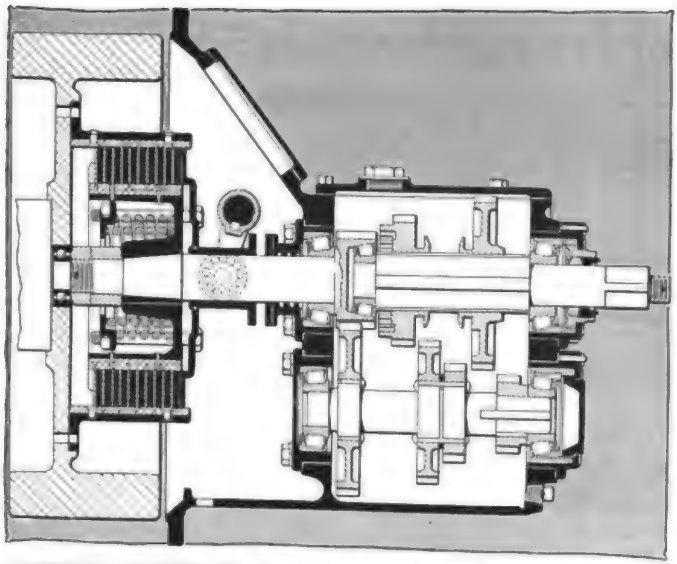
The dash arrangements, as shown in the accompanying illustration, are arranged for convenience. The position of the speedometer makes it readily legible and permits the shaft to be laid without sharp bends. At A are the oil sight feeds, at B the dual kick switch, at C the valve and connection for the power tire pump, D is the handle of the Prest-O Starter, and at E, the button that controls the head lights and standing lights respectively. The electric system is of Ward-Leonard manufacture and consists of a generator mounted on the right side of the motor and gear-driven from the engine which supplies current to an 80-ampere-hour storage battery situated on the right running board, through a cutout which automatically prevents overcharge and leakage of current from the battery back through the generator armature. This current is used for both lighting and as auxiliary to the magneto in ignition. This generator will produce sufficient current to light the car independent of the battery at normal running speeds.

Tires are of 34 by 4-inch size on Baker demountable rims, as regular equipment. The rest of the equipment includes a power tire pump driven by a pair of sliding gears from the engine, a starter of the acetylene type, supplied from a Prest-O-Lite tank, a mohair top with boot and side curtains, a windshield, five electric lamps, a Stewart speedometer with grade indicator, a spare rim, tire carrier, and full tool equipment.

Two Body Types

This chassis is fitted with two types of bodies, a fore-door touring car, all four doors of which are practicable, and a two-passenger speedster with two doors. The position of the center levers on both models is sufficiently forward to permit the driver to pass behind them and leave by the right-hand door. The floor of the front compartment of the touring car and of the speedster is carpeted with cork linoleum bound with aluminum and the tonneau of the touring car is floored with carpet, bound with leather.

The interior walls of the bodies are covered with leather and the doors are fitted with pockets. The bodies are protected from splash and mud by completely inclosed running boards of sheet steel.



MULTIPLE-DISK CLUTCH AND GEARSET UNIT, SHOWING NEW BALL BEARING THRUST OF CLUTCH CLEVIS

No rivets appear on these members, all supports and connections being electrically welded thereto. All metal parts are finished in nickel or black enamel, the dash, dashrail and capping are of black walnut secured with nickel screws and cap washers. Fifteen gallons of gasoline are carried a low position, by gravity.

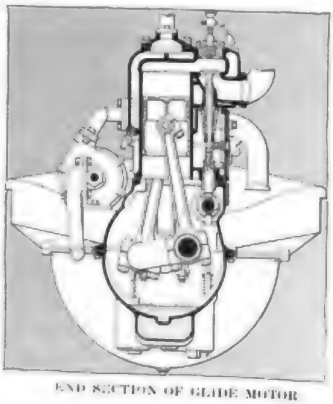
Fifteen gallons of gasoline are carried in the tank beneath the seat of the touring car and 25 gallons in the cylindrical tank on the rear deck of the speedster. Both feed to the carbureter, which is in a low position, by gravity.

Features of Peugeot

(Continued from page 35.)

been necessary to prevent leakage owing to the unusually high oil pressure maintained. The camshafts are fed by a hand pump, with an overflow to the basechamber. A downward extension of the vertical spindle driving the timing gears, operates the oil pump, the Bosch high tension magneto and the water pump, Fig. 5, are driven from the respective extremities of a transverse shaft. During all its races the car was fitted with a new type of Claudel carbureter.

A multiple-disk clutch takes the drive from the motor to the four-speed gear box, this latter, as already explained, being mounted on the subframe. The gearbox is a compact structure with the two shafts carried in a horizontal plane and having the selector within the box, instead of being on the outside of the frame members as is usual. As can be seen from the illustration, Fig. 6, it is



END SECTION OF GLIDE MOTOR

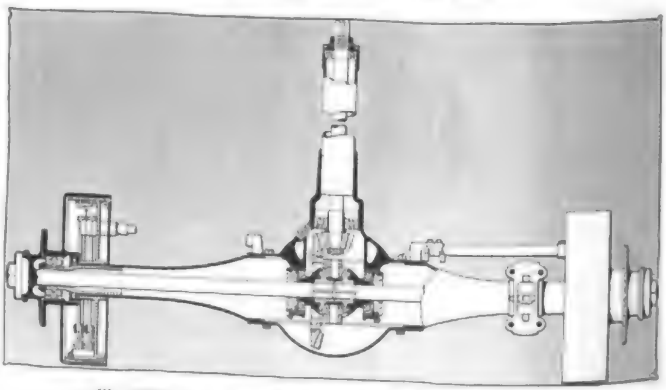
completely protected from dust, there being nothing external but the change speed lever. The arrangement of the three sliding sets of gears is not that usually adopted: the first one gives the first and reverse speeds; the second and third, and the fourth direct drive by means of a dog clutch. At a motor speed of 2,200 revolutions a minute, the ratios give a car speed of 55, 74, 99, and 112 miles an hour. Both primary and secondary shafts are bored out to reduce weight.

Rear Axle Construction

The propeller shaft has a universal joint at each extremity, these joints being carried on ball bearings. A floating rear axle is employed with a vertically-divided differential housing of aluminum. This rear axle is a remarkably light construction, and in order to reduce weight even the cover of the bevel pinion housing and the jaws of the universal have been drilled. Very large diameter ribbed brake drums are fitted, the operation of the rear wheel brakes being by hand lever with steel cable connection.

There are neither radius nor torsion rods, all the effort being transmitted through the rear springs. The foot brake, also of the ribbed type, encircles a broad faced big diameter drum at the rear of the gear box. The two shoes are united by a vertical screw having rapid right and left hand threads cut on it, it thus being merely necessary to turn this screw in either one direction or the other in order to separate or bring together the two shoes. Provision is made for very rapid regulating of the brakes; the hand brakes can be regulated through a trap in the foot boards while the car is in motion.

No attempt whatever has been made to incorporate a stream line contour in the body. The bonnet is narrowed in somewhat at the front, thus reducing the width of the plane surface radiator, but there is no other attempt at wind cutting. The gasoline tank is carried transversely across the frame behind the driver's seat and the two spare wire wheels are to the rear of the tank.



FLOATING REAR AXLE OF NEW GLIDE CAR FOR 1913 SEASON

The Motor Car Repair Shop

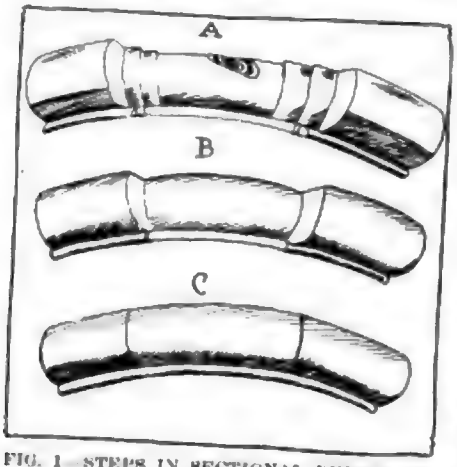


FIG. 1—STEPS IN SECTIONAL REPAIR OF CASING

Repairs of the Tires

Part I

THOUGH extensive repairs of tires should not be attempted in the shop without a complete line of equipment, a knowledge of the processes and methods used for repairing different classes of injuries in tires is of benefit, even though they are not undertaken. Such knowledge will assist the repair man in advising clients as to what can be done with a damaged tire and what the approximate cost will be. The B. F. Goodrich Co. recently has issued a manual of tire repairing which, while applying in particular to Goodrich tires, the instructions can be followed in examining and repairing any standard make of tire.

Repairs to casings may be divided into three classes: Inside repairs, sectional repairs and retreading. An inside repair may be made in a casing in which there is a cut through the tread of not more than 2 inches in length or a fabric break not involving all the plies of the fabric. In making a repair on an injury of this kind slip out two plies of fabric for a space of 3 inches on each side of the injury, removing the first ply halfway around the bead. To do this, the bead or protector strip should first be loosened back to the heel of the bead. On the outside around the injury, bevel the thread to a feather edge and then buff thoroughly on a wire buffing wheel. The tire at this stage has the appearance shown at A and C, Fig. 2. The parts to be repaired are then washed with benzine and two coats of cement applied, covering a space of 2 inches larger than the size of the fabric cut out. At least 1 hour should be allowed for each coat of cement to dry. Then two plies of fabric are inserted and fitted accurately to the space cut out and over this a patch E is applied composed of two plies, stepped, of same kind of fabric. This patch should be 2 inches longer than the fabric stepped out and should not extend closer than ¼ inch to the toe of the bead as far towards the heel as the cutting down extends. The bead strip is then rolled down into its position. The inside of the casing is now ready for curing and has the appearance shown at B.

Around the edges of the injury outside, a strip of gum 1/64 inch thick is applied and then filled up even with tread gum. The outside of the casing ready for the cure is illustrated at D. The cure takes 35 to 40 minutes at 50 pound steam pressure in a cavity vulcanizer and then on an inside vulcanizer for 25 to 35 minutes at the same pressure.

Any injuries to the fabric over 2 inches long involving all the fabric piles, should be repaired by inserting a sectional repair or reinforcement. To prepare the case for this treatment remove the cover and tread—including breaker strip and bead strip—not less than 4 inches beyond each end of the injury. All the gum having been removed, measure in 1 inch from each end of the exposed fabric, and with a fabric knife cut the first ply only, following it down over the bead on each side. Entirely remove this ply from the beads and case, using a fabric hook for this purpose. One inch from where the first ply of fabric is cut out cut the second ply, taking this off to the center of the bead, unless the injury is at or close to the bead, in which case remove it to the toe or tip of the bead. If the removal of a third ply is advisable step it out in the same way, but this will be necessary only in the case of 4½-inch cross-section or larger, and to the bead only.

Around the edge of the hole or cavity, skive the fabric to a bevel or feather edge in order to prevent the new and old fabric from separating after the repair has been made. Skive or bevel both edges of the old gum and buff on a wire buffing wheel until the edges are well ruffed up. If any of the old friction adheres to the fabric, buff the fabric lightly to remove it. The casing with its cut down section ready to cement is shown at A, Fig. 1. Clean thoroughly inside and out with benzine or gasoline. Clean the inside for a space of about 2 inches more than the outside has been cut down. Apply two coats of cement both inside and outside, allowing an hour to intervene after each coat. Inside the case insert a patch of two plies, stepped, of fabric. This patch should be 2 inches longer than the outside repair, and should extend only within ¼ inch of the toe of the beads. Place casing on tire form, fill in the injury with cushion gum and put a narrow strip 1/64 inch thick of the same gum over each exposed edge of fabric where it has been stepped out, and over the exposed beveled edges of old gum. Replace each ply of fabric that has been removed with fabric. The last ply should overlap each end ¾ of an inch on the tread and taper down to no overlap on the sides. Run the fabric down on the beads only so far as you have taken out the original fabric. Replace the bead strip with fabric. Use fabric from 3 to 3½ inches wide for the breaker strip. Apply unvulcanized gum on the sides 3/32 inch thick. The casing with fabric applied is illustrated at B. Then fill up with either dark or light gum, depending upon what shade of tread is to be matched.

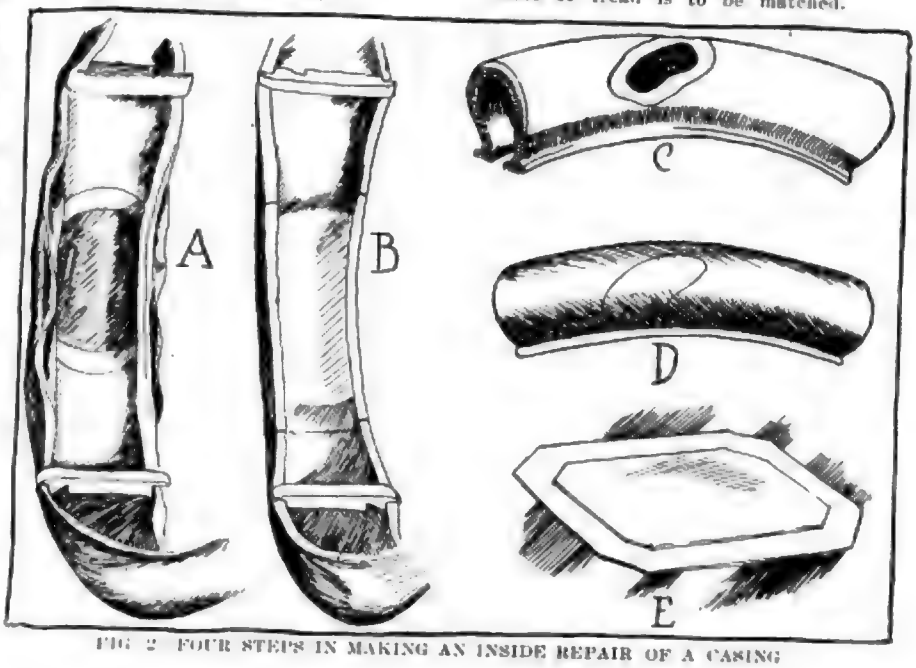


FIG. 2—FOUR STEPS IN MAKING AN INSIDE REPAIR OF A CASING

From the

WHEEL Tax at Danville—Danville, Ill., placed a new wheel tax in effect October 1, and, as it affects motor cars, many owners are protesting.

Fargo Has Building Bee—The Fargo Automobile Club of Fargo, N. D., is seeking a site for a club house which it proposes to erect early in the spring. The plan is to build a club house on the banks of the Red River of the North a few miles from the city. Golf links and tennis courts will be provided and the club will be conducted as a town and country club.

Indianapolis Registrations — Approximately $25,000 have been collected by the city of Indianapolis so far this year for motor vehicle licenses. Until this year the annual fee was $3 and the amount raised last year was $7,800. Thus far this year licenses issued have been as follows: Runabouts, 1,262, at $5 each; touring cars, 1,748, at $8 each; light trucks, 158, at $10 each; and heavy trucks, 184, at $15 each. The total number of cars licensed this year has been 3,352, as compared with 2,600 last year.

Texans After a Club House—A committee has been appointed at Dallas, Tex., to make plans for the erection of a $30,000 club house to be known as the Sister City's club house. The erection of the building will be under the direction of the Dallas and Ft. Worth motoring associations. Plans are to erect the building at a point midway on the Dallas-Ft. Worth pike, and also easily accessible by the interurban. An option has been secured on several acres of land. In addition a garage will be erected.

New Idea in Garages—The Bridge Street hotel, one of the landmarks of Grand Rapids, Mich., is being razed and will be replaced by a garage and motor car and supply establishment with hotel accommodations as a side issue. The building will be 100 by 100 feet, three stories in height, and will be known as the Modern garage. It is to be located at Michigan street and Bond avenue. Hotel accommodations, except meals, will be provided for tourists in the new building and separate apartments for motor cars, to which owners of the cars may carry the keys, will be provided. The new building is expected to cost $50,000.

Ohio Farmers Buying Cars—According to the statistics furnished by the state registrar of motor cars of Ohio, the rural sections of Ohio are buying cars as never before. The wheat and oats crop is being rapidly converted into motor cars, as is shown in the number of applications for registration coming from the rural counties. Of the licenses issued now about 80 per cent come from the strictly agricultural communities. In the counties of Madison, Miami, Pickaway, Ross, Fayette, Licking, Montgomery, Fairfield and other rich agricultural counties the elevators are fairly bulging out with grain and automobiles find a ready sale. For the first half of September the number of new cars registered was over fifty per day. The rule in farming sections now is early selling of grain and this aids the motor trade.

Herding with a Motor Car—The latest use of the motor car in Texas is in herding cattle on the western plains. During the past week the idea of herding cattle in a car was tried out on a ranch in Potter county.

Rock Island Motorists Organize—The Rock Island Automobile Club was organized at a meeting in Rock Island, Ill., the following officers being elected: President, Joseph DeSilva; secretary, Charles E. Hodgson; treasurer, George W. Reddig. The object of the club is to secure the improvement of the country roads and promote the welfare of the members. The club will affiliate with the state organization and do everything in its power to secure state highways.

Completing Brick Road—Rapid progress is being made on the new brick road between Niagara Falls and Buffalo, N. Y., and the entire boulevard will be completed by October 1. The boulevard is being built of brick for a width of 16 feet for motor vehicle traffic, while 16 feet of dirt road is left open for horse-drawn and other slow vehicles. This method was followed in the construction of the road so that the 16 feet of dirt road may be extended in width to 32 feet in future if necessary.

Hoosier Club Contributes—An appropriation of $2,000 has been made by the Hoosier Motor Club of Indianapolis for the fund being raised to buy the material for building a rock road from New York to San Francisco. The club has endorsed the plan, as has the Indianapolis Commercial Club. The club, on September 28 and 29, will give a sociability run to the farm of George Ade, at Brook, and to Kentland. A reception will be given by the Commercial Club of Kentland to the club on the evening of September 28. Those making the trip will spend the night at Kentland.

Motoring in Venezuela—An extensive concession providing for a motor passenger and freight service covering a considerable territory in the vicinity of La Guaira, Venezuela, has been granted, subject to the approval of the national congress. The concessionaire will construct the roads necessary to the maintenance of his schedule. The government will protect the enterprise from competition for a period of 30 years, but all tariffs must first be approved by the authorities before being made effective. One of the chief difficulties that has surrounded the motor car industry in La Guaira is the difficulty of securing gasoline. Passenger vessels refuse to carry it and the supply comes from sailing vessels only, whose calls are irregular and far from frequent. The standard price of gasoline is 65 cents per gallon.

Michigan Picks Road Officials—At the annual meeting of the Michigan State Good Roads Association, the following officers were re-elected: President, Philip T. Colgrove, Hastings; vice-president, N. P. Hull, Dimondale; secretary, A. A. Anderson, Hastings; treasurer, J. Edward Roe, Lansing. Following are the trustees chosen: Roy D. Chapin, Detroit; Alvah Brown, Grand Rapids; W. K. Prudden, Lansing; Maj. Arthur Loomis, Ionia; W. W. Todd, Jackson.

Object to Street Car Law—The Columbus Automobile Club, Columbus, will make every effort to secure the repeal of the recent ordinance that provides that a motor car while passing a street car, discharging passengers, must come to a full stop. The ordinance went into effect September 15, but up to the latter part of the week there were no arrests by the police for the violation of the same. The ordinance provides for fine from $5 to $25 for the first violation and 30 days' imprisonment for subsequent violations.

Dominion Wants Federal Aid—Winnipeg will have the third annual convention of the Canadian Highway Association, which is scheduled to meet on October 9 and to continue its session until October 12. One of the important subjects to come up for consideration will be the granting of federal aid for road building in the different provinces. Last year $1,000,000 was set aside for this work, but the bill failed to meet with the approval of the elected representatives of the people, not because the measure was not approved of, but on account of technical objections which were raised in the upper house. It is the intention to reintroduce this measure at the next session.

Minnesota Reports—Every county in Minnesota, except Cook, is shown by figures of the state tax commission to have motor cars. In the state the tax list shows 21,218 machines, estimated in value at $6,460,220. The commission is engaged in equalizing taxes on property in the state. Including motor cycles the commission finds that St. Paul has 2,070 motor vehicles, worth $972,335, at an average of $469.73 each. Ramsey county has 2,122 cars, valued at $989,621. St. Paul is the county-seat. A year ago St. Paul had 1,416 cars, worth $831,115. In the same list Minneapolis is rated at 5,023 cars, valued at $2,296,470, at an average of $475.19. Hennepin county, of which Minneapolis is the seat, has 5,316 cars, worth $2,415,465. For Minneapolis the 1911 figures were 3,946 cars, worth $1,721,665.

Four Winds

In Duluth there were reported for taxation 532 cars, valued at $287,093, at an average value of $558.45. Last year the city reported 426 cars, totaling $241,069.

Cars Barred from Island—As a result of Captain F. C. Pendleton of Brooklyn, N. Y., driving his motor car through the roads of Isleboro, Me., that had been held sacred against motor traffic through an unwritten law, the residents of that town called a special town meeting and by a vote of 58 to 7 directed the selectmen to take steps to exclude motor cars from the island kingdom.

Texas Motorists Co-operating—The Automobile Owners' Protective Association is the latest addition in the way of organizations in Dallas, Tex. The members of the association have organized with a capital stock of $25,000 and have leased premises for a garage. O. H. Bettes has been made manager. The garage is for the use of members of the association. Legal advice is also offered to the members of the association.

Demand a Stone Road—As a direct result of the sociability tour which was made from Nashville to Huntsville, Ala., recently, the Tennessee-Alabama Good Roads Association has been formed. The association will work for the general improvement of roads, but the principal efforts are to be confined to the improvement of the trunk line highway between Nashville and Huntsville. The members of the new association do not expect to be satisfied until the two cities are connected with a stone roadway.

Reciprocity Law Pinches—The Springfield, Mass., Motor Club has decided to get busy when the next legislature meets to try to have a change made in the motor law whereby there will be a better plan for reciprocity touring in the New England states. Visitors from Vermont, Connecticut and Maine are limited to 10 days in the Bay State, but Massachusetts motorists are not restricted in those states. There has been a lot of friction this year over the reciprocity clauses and a change will probably be made next year in some of the states.

Call Out for Road Meeting—Under the auspices of the Commercial Club and with the co-operation of the Indiana Good Roads Association, a good roads convention will be held in Indianapolis during the first week in December. Invitations are now being sent to all persons in Indiana interested in road building asking them to attend. There will be an exhibit of good roads machinery in Cincinnati the week before the Indianapolis convention and an effort will be made to have the exhibit in Indianapolis for the meeting. It is thought the meeting will result in a number of bills for good roads legislation being prepared for introduction in the Indiana legislature, which convenes in January.

Car Tows Canal Boat—The experiment of towing canal boats by motor car was made at Pendleton, N. Y., by William Gleasner, superintendent of the Great Lakes Co., barge-canal contractor. With a 30-horsepower car he towed a canal boat loaded with lumber for a distance of 3 miles at the rate of 6 miles an hour.

Will Not Increase Tax—After considering the matter several days the county council of Marion county, Ind., in which Indianapolis is located, has refused to increase the county road tax levy from 3.15 cents to 6.3 cents on each $100 of taxable property. About 300 Indianapolis business men urged the council to double the road tax levy, believing that proper and efficient road building would result.

Motors Too Numerous—Because motor cars pass her property too frequently, and in one Sunday recently 4,700 cars swept along past the door, Miss Kate Cary of New York, one of the heirs of Mrs. Hartman Kuhn of Boston, is to move Butternut cottage in Lenox, built in 1770, to a new location further back from the highway. The noise and dust are too much for comfort and convenience.

Beavers Flood Highway—Motorists who who have been touring in the Dead River region in Somerset county, Maine, report trouble on the Horseback road in Highland plantation due to a colony of beavers. The little animals have built a dam in the culvert near the road diverting the water to the highway and flooding it for a foot or more. The county commissioners have had bother there every summer for some years, due to the beavers, and it has cost thousands of dollars to repair the highway. It does no good to remove the dam, for the beavers rebuild it again in a night. Old trappers state that so long as two beavers remain there the dam will be built repeatedly, for they never abandon a dam, once it has been built.

District's Registrations—The annual report of H. M. Woodward, permit clerk, reveals the fact that permits to operate motor cars in the District of Columbia were issued to 2,343 out of 2,393 applicants who were examined by the motor car board during the fiscal year that ended June 30 last. Of the permits granted 200 were for the operation of electric vehicles, 1,790 for gasoline machines, 22 for steam cars, and 331 for motor cycles. The revenue derived amounted to $6,022. There were registered and paid for during the year 3,924 metal identification tags, which produced a revenue of $7,848. Two permits were revoked during the year because of charges filed and upon recommendation of Major Sylvester, superintendent of police.

Vermont Club's Annual Meeting—The Automobile Club of Vermont held its annual meeting at Montpelier last week. The membership of the club is now 1,275. The election of officers resulted as follows: James M. Boutwell, Montpelier, president; E. A. Brodie, Burlington, vice-president; G. T. Chaffee, Rutland, second vice-president; S. S. Ballard, Montpelier, secretary-treasurer.

New Color for Alabama—Flaming red is to distinguish Alabama license tags during the coming year. The license year expires September 30, and in order to avoid a rush at the last minute the state has offered the tags for sale, with the result that many already are in evidence. Cars up to 9 horsepower pay $7.50; up to 29 horsepower $12.50; up to 34 horsepower $17.50; up to and above 40 horsepower $20. Cars for hire pay an additional tax of $25.

Yakima After Paved Roads—Yakima county, Washington, will vote on a million-dollar bond issue at the time of the general election, November 5, for the construction of paved roads outside the incorporated towns. Instead of building trunk-line roads the length of the county the commissioners will divide it into districts with an industrial or shipping point as center of each, from which the paved highways will radiate to the fruit and hay-raising districts.

Would Improve Milwaukee Law—Proposed ordinances to repeal or so materially alter the present universal light law of the city of Milwaukee, Wis., as to make it useless, have failed, due to a hard fight by the Milwaukee Automobile Club, which proposed the law in the first instance. Since August 24 all vehicles within the limits of Milwaukee must carry a light visible from front and rear during the period from 1 hour after sunset until 1 hours before sunrise, and a month's trial of the law has convinced more firmly than ever the city fathers that the ordinance is an excellent preventive of possible accidents.

Pittsburgh's Dream Comes True—Within the next 2 weeks the new boulevard leading to the Hill Top boroughs from the south side in Pittsburgh, that has been the dream of the business men and residents of that section for years, will be declared officially completed. Where formerly there was nothing but a rough thoroughfare gouged out along the hillside and winding about with treacherous curves, there will now be a well-paved street, with graceful curves and strong retaining walls. The improved section is nearly a mile long. The grade averages about 7 per cent. This is about the same grade as the old road, but the advantage has been gained by the fact that the bad angles on the road have been eliminated by the reconstruction.

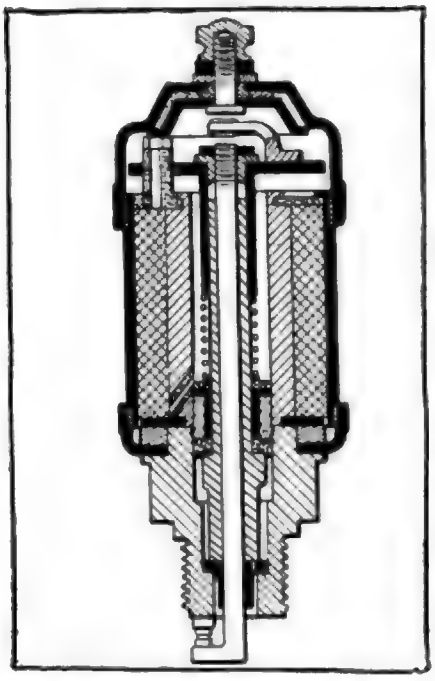


FIG. 1—WITTER LOW-TENSION PLUG

Current Motor Car Patents

PATENTS ISSUED SEPTEMBER 17, 1912.

1,038,519—Steam Vulcanizer. Ansel M. Baugh, Omaha, Nebr. Filed March 22, 1911. Serial No. 628,711.

1,038,520—Valve Remover. Harry J. Beck, Indiana, Pa. Filed April 21, 1911. Serial No. 622,640.

1,038,522—Vehicle Wheel. George R. Bennett, Denver, Colo. Filed January 18, 1910. Serial No. 538,767.

1,038,533—Valve and Valve Gear. Walker L. Crouch, Cleveland, O. Filed November 17, 1910. Serial No. 592,770.

1,038,535—Spring Wheel. Charles J. Dean, Blasdell, N. Y. Filed November 17, 1911. Serial No. 660,757.

1,038,537—Gas Engine. Albert J. Dexter, Indian Orchard, Mass. Filed June 14, 1911. Serial No. 633,058.

1,038,541—Explosive Engine. Orlando Ducker, Washington, D. C. Filed September 24, 1910. Serial No. 583,626.

1,038,553—Transmission Gear Mechanism. Clayton E. Frederickson, San Francisco, Cal., assignor of one-half to William H. Stenger, Berkeley, Cal. Filed November 7, 1911. Serial No. 658,960.

1,038,569—Attachment for Motor Car Wheels. Fred V. Grover, Park Rapids, Minn. Filed January 2, 1912. Serial No. 668,870.

1,038,576—Spring Vehicle Wheel. Christian F. Heines, Cincinnati, O. Filed August 10, 1911. Serial No. 643,274.

1,038,592—Magneto. Carl E. Johnson, Los Angeles, Cal., assignor of one-half to Charles E. Payne, Los Angeles, Cal. Filed August 30, 1909. Serial No. 515,329.

1,038,598—Valve Mechanism for Motor Car Engines. Orlando E. Kellum, Los Angeles, Cal. Filed July 20, 1911. Serial No. 641,205.

1,038,612—Engine. George A. Lowry, Pawtucket, R. I. Filed May 7, 1910. Serial No. 559,970.

1,038,615—Electric Vehicle. Roderick Macrae, Chicago. Filed February 13, 1911. Serial No. 608,333.

1,038,628—Strap-Clutch. James L. Morrow, Antioch, Tenn. Filed December 27, 1911. Serial No. 668,113.

1,038,636—Expansible Chamber. Henry E. Oxnard, Newton, Mass. Filed May 18, 1910. Serial No. 562,011.

1,038,661—Vehicle Wheel. Charles A. Russell, Providence, R. I. Filed September 27, 1910. Serial No. 584,066.

1,038,685—Exhaust for Gas Engines. Albert T. Titus and Albert R. Titus, Robbinsdale, Minn. Filed April 25, 1911. Serial No. 623,220.

1,038,687—Pneumatic Wheel. George H. Treadgold, Port Huron, Mich. Filed October 20, 1911. Serial No. 655,679.

1,038,689—Variable-Speed Power Transmission mechanism. Willard Irving Twombly, New York, assignor by mesne assignments to Twombly Motors Co., New York. Filed April 12, 1910. Serial No. 554,977.

1,038,690—Carbureter. John Wilkinson, Syracuse, N. Y., assignor to H. H. Franklin Mfg. Co., Syracuse, N. Y. Filed August 18, 1902. Serial No. 120,058.

1,038,701—Spark plug. William Sibert Witter, Julesburg, Colo. Filed February 21, 1911. Serial No. 609,961.

1,038,706—Universal Joint and Four-Wheel Drive. John L. Yeoman, Chehalis, Wash. Filed December 5, 1911. Serial No. 664,018.

1,038,737—Anti-Skidding Device. Ernst Finking, Leipzig, Germany. Filed May 20, 1910. Serial No. 562,384.

1,038,739—Dirigible Headlight. Joseph Patrick Fox, Chemnitz, Germany, assignor of one-half to Otto Reinmann, Chemnitz, Germany. Filed June 16, 1911. Serial No. 633,581.

1,038,764—Spring Wheel. Joel D. Knight, Lombardy, Miss. Filed February 29, 1912. Serial No. 680,714.

1,038,767—Internal-Combustion Engine. Arthur M. Laycock, Detroit, Mich. Filed November 27, 1911. Serial No. 662,552.

1,038,780—Engine. John W. Moore and William A. Browne, Columbus, O. Filed September 14, 1910. Serial No. 581,936.

1,038,804—Carbureter. Joseph D. Warren, Providence, R. I. Filed May 9, 1910. Serial No. 560,109.

1,038,808—Shock Absorber. Frederick W. Weyman, Hartford, Conn. Filed January 8, 1912. Serial No. 669,992.

1,038,830—Internal Combustion Engine. Louis Henri Libert Bellem and Gaston Jean-Baptiste Bregeras, Neuilly-sur-Seine, France. Filed August 17, 1909. Serial No. 513,261.

1,038,833—Power-Transmitting Mechanism. Joseph E. Bissell, Pittsburgh, Pa. Filed June 28, 1909. Serial No. 504,781.

1,038,835—Traction Wheel. Samuel M. Bower, Chicago. Filed September 6, 1910. Serial No. 580,744.

1,038,878—Gas Engine Valve. William E. Hallett, Bucyrus, O. Filed October 10, 1909. Serial No. 523,057.

1,038,889—Oil-Feeding Device. Charles F. Hoofer, Spokane, Wash. Filed July 22, 1911. Serial No. 639,910.

1,038,903—Resilient Metal Wheel Rim. Carl La Cour, Hubbard, Ia. Filed November 29, 1910. Serial No. 595,164.

1,038,918—Power-Transmission Device. George W. Marble, Chicago, assignor to Stephenson Motor Truck Co., Milwaukee, Wis. Filed January 20, 1910. Serial No. 540,796.

1,038,921—Carbureter. William Edward Martin, Stamford, Conn. Filed December 27, 1911. Serial No. 668,191.

1,038,931—Muffler. Joseph M. Michaelson, Minneapolis, Minn. Filed June 5, 1911. Serial No. 631,236.

1,038,941—Gas Valve. Frederic G. Nicolaus, Cleveland, O., assignor to American Store Co., St. Louis, Mo. Filed July 11, 1911. Serial No. 637,933.

1,039,010—Devulcanizing Apparatus. James Bardsley, Akron, O. Filed December 31, 1910. Serial No. 600,227.

1,039,014—Spring Hub for Vehicle Wheels. Herbert Berton Bigsby and William Milo Lewis, New Hartford, Ia. Filed January 11, 1912. Serial No. 670,639.

1,039,035—Bucking Motor Car. Edward W. Desenfants, Chicago, assignor of one-half to Charles E. Desenfants, Chicago. Filed December 9, 1909. Serial No. 532,184.

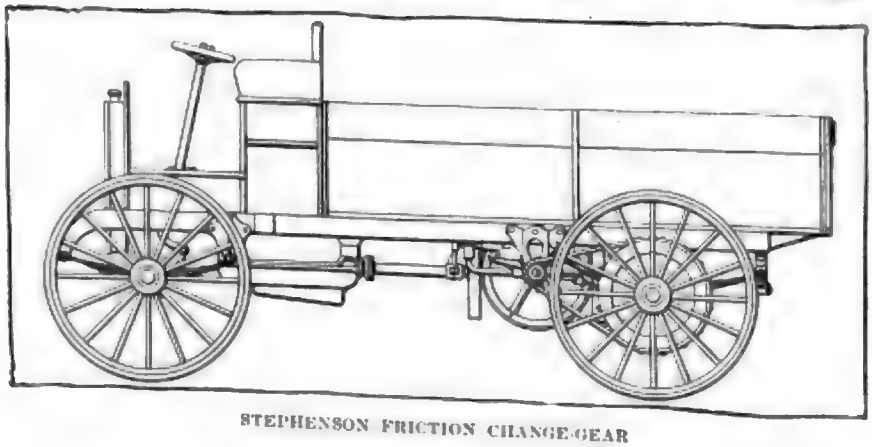
1,039,048—Gas-Cock Lock. George A. Glass, Newark, N. J. Filed February 24, 1912. Serial No. 679,724.

1,039,063—Armored Pneumatic Tire. John Lend, Chicago, assignor, by mesne assignments, to Sanford C. McKnight, Chicago. Filed November 24, 1909. Serial No. 529,803.

STEPHENSON Friction Drive—No. 1,038,918—To George W. Marble, Chicago, assignor to Stephenson Motor Truck Co., Milwaukee, Wis. Filed January 29, 1910, dated September 17, 1912. This transmission is of the double disk and wheel type, comprising two disks mounted on different portions of a longitudinal driveshaft, between which are two friction wheels mounted on a transversal jackshaft. The disks are disposed with their faces opposing, and each revolves with the driveshaft. The jackshaft is divided independently, one friction wheel driving each division. These friction wheels are linked so they move toward or away from each other, by means of a suitable control, at equal distances from the shaft, so they always are driven at the same speed respectively; variances of their speed in ratio to the speed of the driveshaft are obtainable by such motion. The jackshaft is mounted on movable bearings so it can be moved either forward or back, to engage with one disk or the other, thus driving the shaft either forward or reverse, or to remain in a central position. Chains connect the jackshaft to the wheels.

Make-and-Break Spark Plug—No. 1,038,701—To William Siebert Witter, Julesburg, Colo. Filed February 21, 1911, dated September 17, 1912. To secure a make-and-break low-tension spark in an engine built for the jump-spark system without mechanical changes or additional mechanical appliances, is the purpose of this device. The make-and-break mechanism is electrically operated by means of an electro-magnet. The plug consists of a steel shell, threaded to fit the regular spark plug tap in the cylinder, mounted with an electro-magnetic coil wound upon a hollow core. Within this core is a firing-pin, disposed within an insulating sleeve, and provided with a sliding guide and a returning spring.

The lower portion of this firing-pin is in the form of an electrode, normally in con-



STEPHENSON FRICTION CHANGE-GEAR

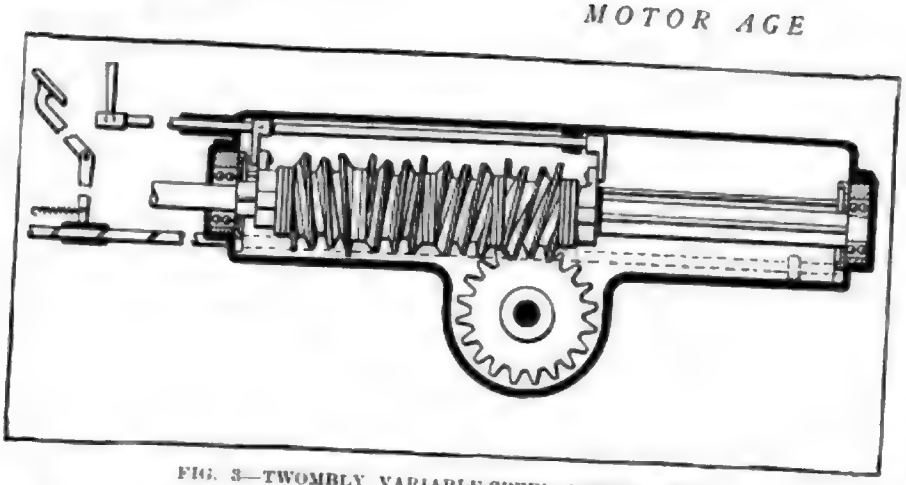


FIG. 3—TWOMBLY VARIABLE-SPEED WORM DRIVE

tact with a sparking point on the plug body. An armature is mounted above the electro-magnet, and also provided with a spring. Upon this armature is a hammer which serves to violently drive the firing-pin down upon the drawing down of the armature. The magnet is wired in series with the sparking point and firing pin. The low-tension current is timed and distributed in the ordinary way. When the circuit through the plug is made, the magnet is energized and draws the armature down. In its passage, the attached hammer drives down the firing pin, breaking the internal contact violently, thereby producing a large spark.

Variable-Speed Transmission Mechanism—No. 1,038,889—To Willard Irving Twombly, New York, assignor by mesne assignments to Twombley Motors Co., New York. Filed April 12, 1910, dated September 17, 1912. Consisting of a worm-drive transmission, this invention comprises a driving shaft, threaded with worms of various pitch and direction, adapted to engagement with a toothed driven wheel. The shaft upon which the worms are disposed is mounted on movable bearings, and may be brought into engagement or out of engagement with the toothed wheel. The worms are disposed on a sleeve, secured to the driving shaft, which may be slid upon the shaft to bring any of the worms, selectively into mesh with the driven sprocket wheel.

Their pitch is such that a given speed in a given direction of the driving shaft will cause the driven sprocket to turn at a different speed for each worm, one or more worms being so cut as to reverse the direction of the driven sprocket. The whole is encased in a suitable housing, and connected to controls adapted to bring the worms out of, or into engagement with the driven sprocket, and to selectively bring any of the worms into operating position. This device eliminates the gearset, but would, of course, require a clutch as usual, and would be controlled in the usual manner.

Four-Wheel Drive—No. 1,038,706—To John L. Yeoman, Chehalis, Wash. Filed December 5, 1911, dated September 17, 1912. For use in connection with a four-wheel driven motor car, this device consists of a live front axle power-driven, and mounted with two wheels, which are adapted to be steered, and to take the drive at any angle. This is accomplished by a ball mounting of the wheel spindles

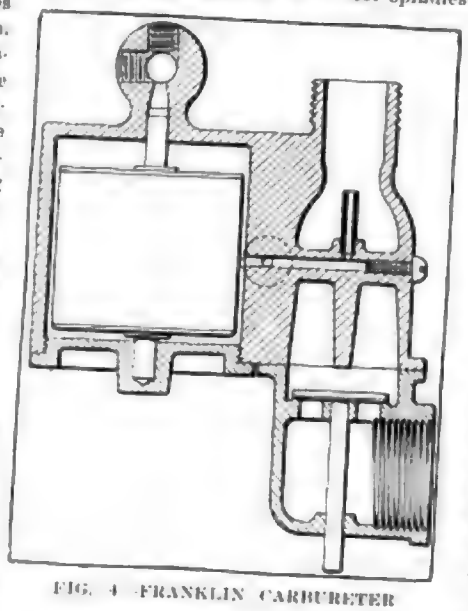


FIG. 4—FRANKLIN CARBURETER

to the axle. Each hub is fitted with a cylindrical projection on the inner side that is internally threaded. Screwed into the first thread is the ball-receiving member that supports the wheel on the axle, and into the other a retaining cap to hold a loosely-mounted ring to the hub. This ring is mounted between collars, and leaves the wheel free to revolve and to turn, but retains it vertically, being rigidly linked to the steering connections so as to turn with the wheel in steering.

Franklin Carbureter—No. 1,038,699—To John Wilkinson, Syracuse, N. Y., assignor to H. H. Franklin Mfg. Co., Syracuse, N. Y. Filed August 18, 1902, dated September 17, 1912. This invention, which is 10 years old, contains features none the less interesting at the present day. The carbureter is of great simplicity and of the float-feed type, with a single non-adjustable nozzle, and a single air inlet. The design of this portion is the most interesting feature of the instrument. A disk valve with a downwardly extending stem is seated over the air inlet at the lower portion of the mixing chamber. The opening is normally closed, by gravity, the weight of the valve being so determined that the opening of the valve, and consequently the amount of air admitted, is correctly proportioned to the vacuum in the mixing chamber. No adjustments of any nature are provided.

German Headlight Turner—No. 1,038,739—To Joseph Patrick Fox, Chemnitz, Germany, assignor of one-half to Otto Reimann, Chemnitz, Germany. Filed June 16, 1911, dated Sept. 17, 1912. This attachment is for the purpose of turning the headlights of a motor car automatically to conform with the movement of the steering gear, or to operate them manually, independent of the action of the steering gear, at will. This is accomplished by means of a suitable linkage to movable lamp brackets from a revolving sleeve, about the steering column. This sleeve is controlled by means of a pivoted lever normally engaging one of the spokes of the steering wheel spider, and being held so by a spring, but adapted to be turned to clear the spoke, for independent manual operation, or to be locked in a stationary position. The value of this arrangement is, that in running where many turns are to be made, the lamps may be adjusted to turn with the front wheels, while on straight roads, the lamps may be maintained stationary; or they may be turned by hand for exploring.

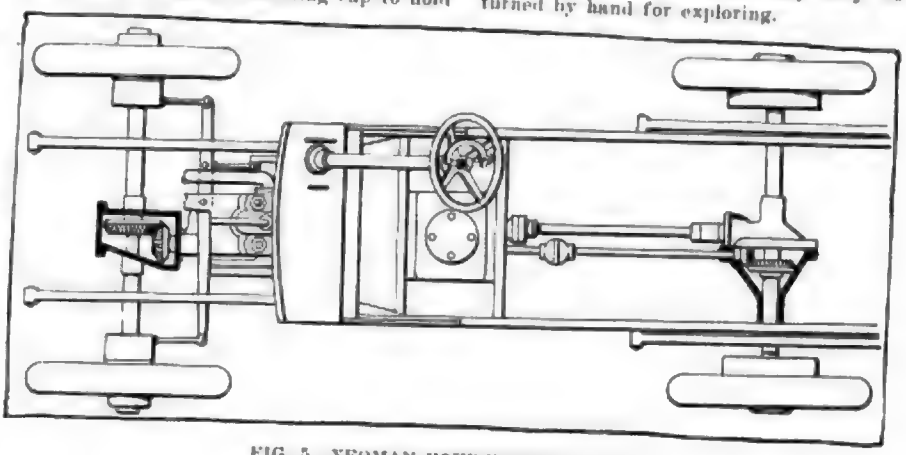
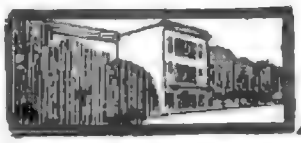


FIG. 5—YEOMAN FOUR-WHEEL DRIVE



Among the Makers and Dealers

HUMPHRIES With Oakland—S. H. Humphries, who has been manager of the Elmore plant at Clyde, O., will take the position of factory manager of the Oakland Motor Car Co., succeeding the late Thomas Wilson.

Change of Name—Papers have been filed with the Secretary of State changing the name of the Middletown Buggy Co., of Middletown, Ohio, to the Crescent Motor Truck Co. The concern will manufacture motor trucks in the future.

Denied by Swinehart—C. A. Swinehart, sales manager of the Swinehart Tire and Rubber Co., Akron, O., denies the report from St. Louis that his company will open a branch factory there. "The new plant announced by J. A. Swinehart will have no connection with the Swinehart Tire and Rubber Co.," he writes. "We have not licensed it or any other firm in St. Louis to manufacture or distribute Swinehart tires."

To Make Vise Plug—The Rapp Mfg. Co. has been incorporated by Toledoans for the purpose of manufacturing a spark plug and other accessories. The capital stock is $15,000. The plant will be located on the fifth floor of the Snowflake building, Toledo. The chief product will be an indicating spark plug which will locate ignition troubles at a glance and will be known as the Vise spark plug. The officers of the company are: President, Fred Hummel; secretary, C. D. Few; treasurer, Clifford Stone.

Salem's New Garage Law—The committee on ordinances of the Salem, Mass., city government, has drafted a new regulation to cover garages in that city, and it will be adopted by the board of aldermen without much question. It provides that the floor of all garages shall be fireproof construction, and where five or more cars are stored the entire building shall be fire-proof. Buildings used for electric machines are exempt. Certain allowances are made for garages already built and the storing of gasoline will have to be in tanks on the outside.

Buys Pierce Motor Co. Plant—It is announced that the J. I. Case Threshing Machine Co. of Racine, Wis., has purchased the stock, plant and rights of the Pierce Motor Co., of Racine, which has been building the Case car for the big farm machinery works for 2 years. The Pierce works will at once be consolidated with the immense Case works and lose its identity as a corporation. The change is simply one of name, as the principal stockholders in the Case company in July, 1910, purchased the entire stock issue of the Pierce company from A. J. Pierce and his associates, at the same time that the Case company purchased the entire output of the Pierce works and began to market the cars under the trade name of Case. Thus the Pierce company has been for 2 years the property of the owners of the Case corporation.

Enlarging Spring Factory—The Hess-Pontiac Spring and Axle Co., of Pontiac, Mich., is constructing additions to its factory which will double the output. It is expected ultimately to arrange the factory so that the steel may come into it at one end and emerge as finished product at the other.

May Have Winter Show—Because the motor show in connection with the New England fair at Worcester, Mass., recently was so successful there is now some talk among the members of the Worcester Automobile Dealers' Association, which had charge of the exhibition, of conducting a motor show in some large hall during the winter.

Johnstown in Truck Industry—Adam Trabold, of Johnstown, Pa., is at the head of a new concern which has for its purpose the manufacture of motor trucks. The first one built was recently delivered to the Germania Brewing Co., of Johnstown. This year there will be six more trucks turned out, one of which will be 2-ton capacity. It is his intention to build trucks suited to any business or purpose from 1 to 5 tons. The 1-ton trucks will have a motor of 35 to 40 horsepower and wheelbase of 116 inches.

Remy Increases Factory Building—Ground was broken on September 12 for two new additional fireproof buildings to the plant of the Remy Electric Co., Anderson, Ind. The new buildings will give the Remy factory an increase of 10,600 additional square feet of floor space. They will be completed and equipped within 3 weeks. This addition was made necessary by the volume of magneto business which the Remy company has contracted for during 1913. The factory is at present employing over 1,000 men and working night and day shifts.

New Krit Building—The Krit Motor Car Co., Detroit, is erecting a new service building adjacent to its factory on the East boulevard. This addition is to be used as a service stock room and there will also be a show room in connection. The construction is of brick, one story high. All sides are to be filled with Fenestra sash, giving a very light and airy storeroom. The roof is the sand tooth construction, liberally fitted with glass. The building is 85 feet wide by 125 feet long, of which 85 by 15 feet will be used for a show room. In the center of the front is a large plate glass window, in which will be shown the latest Krit models. It is expected that this addition will enable the Krit company to materially better its service department and enable repair parts to be shipped without delaying production of current models.

To Make Brass Castings—The erection of a foundry has been begun in Pontiac, Mich., by the Pontiac Auto Castings Co., composed of men from Detroit and Muncie, Ind. The company will engage in the manufacture of brass castings and later iron and aluminum work will be added to the output. The company is capitalized at $15,000.

Pope Increasing Plant—To care for a doubled capacity for the coming season the Pope Mfg. Co., Hartford Conn., maker of Pope-Hartford motor cars, has let bids for a large addition to its present plant. This building will contain four stories and a basement, and will be 192 by 72 feet, and will increase the total floor space of the factory to 70,000 square feet. The building will have walls mostly made of steel sash windows. The column spaces will be wide, and the floors will be shallow, without air spaces. A semi-detached tower will contain all elevators, stairs and toilets, and a runway will lead to a basement garage. The passageway into the plant will be provided through a passageway cut through the building.

New Goodyear Buildings—The new buildings now in course of erection at the plant of the Goodyear Tire and Rubber Co., Akron, O., is indicative of the progress made by this firm in the last year or so. In addition to the buildings recently completed, other structures, to accommodate the increased business, are being built. A new office building to find room for 500 employes, and to relieve the congestion in the old office building, has been occupied recently. The new building has been built as a wing on the east side of the old quarters. It measures 126 by 50 feet. Adjacent to the new administration building is a new two-story garage, 143 by 56 feet, almost completed, with an extra story at the front of the building to be used as an assembly room. The structural iron work of the new No. 6 building has almost been completed. It will measure 403 feet long by 80 feet wide, and will be six stories high with a basement. Excavations are being made for a new five-story building, measuring 250 by 60 feet, and an extension 325 feet by 40 feet is being made to building No. 14. These three buildings are expected to be completed by the end of the year. They will be utilized to meet the increased demand for motor car tires, and the capacity of the plant will be brought to 8,000 tire casings a day. Two stories were added a month

ago to No. 13 building, and this is now a five-story building, also used to increase the capacity of tire output. The Goodyear company also has just completed a new machine shop, 160 by 50 feet, at its Canadian plant at Bowmanville, Canada.

Rhode Island Dealers' Outing—The member of the Rhode Island Automobile Dealers' Association enjoyed their annual outing last week, when a run was made from Providence, R. I., to Lakeville, Mass. The start was made at noon and the place was reached in a short time. Following the games a dinner was served.

After Larger Plant—The Page Auto Hoist Co., of Grand Rapids, Mich., is making negotiations with the common council for a lease of the old lighting plant on South Market avenue, which was abandoned when the city occupied its new lighting and water station on Monroe avenue. The business of the company has increased until it is forced to seek more room.

Making Engines for Durant—Six-cylinder engines for the Sterling Motor Co., which was recently incorporated by W. C. Durant and associates, will be manufactured at the Detroit plant of the Chevrolet Motor Co. until such time as the Flint factory of the Sterling company has been completed. W. C. Durant has been elected president of the Sterling company, Curtis R. Hathaway, of Detroit, is secretary, and William H. Little, of Detroit, general manager.

New in Ignition Field—The R. C. Wells Mfg. Co., a new corporation at Fond du Lac, Wis., has leased a large plant and will engage at once in the manufacture of electric lighting and starting systems for motor cars. The company virtually is the successor of the Duplex Coil Co. of Fond du Lac, Wis., which recently was purchased by the Rueping interests from E. J. Huber and his associates. R. C. Wells was the general manager of the concern, which manufactured coils, batteries, ignition devices and electric lighting systems for the motor car trade. The new corporation is capitalized at $200,000, the 2,000 shares being divided into 1,500 common and 500 preferred. The principal product will be an improved electric lighting system designed by Mr. Wells, although the production of all kinds of electrical devices will be continued.

Remys Coming Back—It is reported that Perry and Frank Remy, of Anderson, Ind., are preparing to engage in the manufacturing business and that they will develop devices upon which they have obtained patents during the last year. About 2 years ago they disposed of the Remy Electric Co. to interests represented by Stoughton A. Fletcher, an Indianapolis banker, for approximately $1,000,000. The plans of the Remy brothers have not been made public.

Berkshire Company's Troubles—Creditors of the Berkshire Motor Co., of Cambridge, Mass., have been notified by attorneys that the company is financially embarrassed. Its liabilities are placed at $25,000. Although the company has assets of a greater book value than the liabilities the attorneys have found it necessary to liquidate the affairs of the company. This is being done at the instance of the larger creditors. B. Deveraux Barker, an attorney, and James Addison, of the company, have been appointed agents to carry out the liquidation.

Cole Has New Plan—The Cole Motor Car Co., of Indianapolis, has divided the country into territories with district sales managers in charge of certain allotted territory. The idea, according to President Cole, is to give Cole agents and owners stimulated co-operation in having these sales managers keeping in direct personal touch with them. J. R. Moler has been allotted the territory west of the Rockies and the dominion of Canada. C. J. Corkhill takes the territory bounded by the Mississippi on the east and the Rockies on the west. George H. Strout is given jurisdiction over the territory in the southeast and part of the middle west. E. C. Frady, head of the Cole Motor Co., of Chicago, takes the north central states, while William L. Colt, president of the Colt-Stratton Co., Cole eastern distributors, takes charge of a territory bounded east by a line drawn north from Washington to Syracuse, N. Y. These sales managers will work directly in touch with President J. J. Cole and his sales force in Indianapolis.

V-C Company Under Way—The recently formed V-C Motor Truck Co., organized in Lynn, Mass., with Frank S. Corlew president and salesmanager and Frank E. Vallier treasurer and general manager, has secured temporary offices at 15 Willow street. The company has some well known men affiliated with it, among them being John M. Nelson, John P. Stevens, William T. Langmaid, J. P. Crosscup, Charles M. Alley, and S. D. Ritchey. The company is seeking a factory site at Lynn.

New Rambler Building Ready—An imposing sales and service building in Boston is to be opened the first week in October by the Thomas B. Jeffery Co. The building is in the newer Back Bay district, Commonwealth avenue and Hinsdale and Cummington streets. It is a four-story, fireproof structure, 216 feet long, with a frontage on Commonwealth avenue, and is set back 127 feet with an open space attractively graded and laid out. The property has been leased for a term of 12 years at a rental of $102,000. The total floor area is 60,000 square feet. The building will be used for show rooms and sales service headquarters of the Thomas B. Jeffery Co. for Boston and its vicinity.

Overland Changes—President John N. Willys, of the Willys-Overland Co., has brought the traffic departments of most of his properties under one head, with headquarters at Toledo. C. W. Eggers, who for the past 2 years has been traffic manager for the Willys-Overland Co., has been made general traffic manager for the Willys-Overland Co., the Garford Co., Elyria, O., the Gramm Motor Truck Co., Lima, O., Federal Motor Co., Indianapolis, Ind., and Morrow Mfg. Co., Elmira, N. Y. Other changes made was the removal of sales manager J. D. Porter, of the Garford company, with his headquarters from Toledo to Elyria.

FISK RUBBER CO. BRANCH MANAGERS, SALESMEN AND OFFICIALS AT ANNUAL CONVENTION

Development Briefs in Accessory Field

Suggestive Sale Method Used by Machine Makers —Latest Demountable Rim—New Principle in Cushioning Road Vibration—Starter Uses Three Fuels

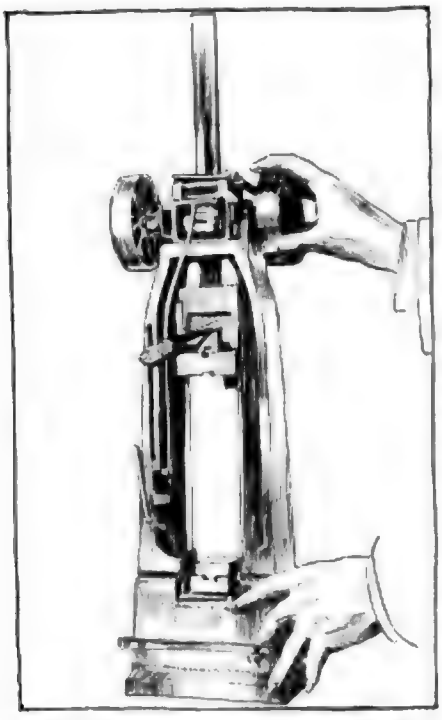


FIG. 1—BILLINGS & SPENCER MODEL

Woeber Demountable Rim

RECENTLY patented by A. Woeber, of Davenport, Iowa, the demountable rim Fig. 4, contains several new and interesting features. As shown in the sectional figure, this rim consists of the usual rim base and felloe band, the former bolted rigidly to the felloe of the wheel, and the latter beaded in the usual manner for the reception of a pneumatic tire. On the inner surfaces of these elements are flat

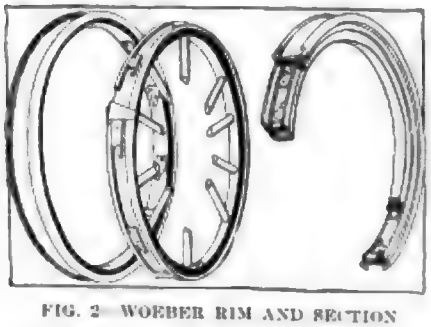


FIG. 2—WOEBER RIM AND SECTION

spaced adjusting wedges, and at the back and front of the rim base are annular bevels, and on the felloe band corresponding surfaces. To apply the rim to the wheel, the straight faces of the adjusting wedges are brought together, and the rim slid on to the wheel. The wedge pieces thus clear each other. The tire and rim are then revolved upon the wheel, the wedges drawing the rim back on the felloe band, and jamming the bevelled faces together, making one tight junction of the two members. A locking wedge is then inserted in a groove, opened by this revolution of one member upon the other, which locks the adjusting wedges against revolution backward. This latter piece is held in place by a retaining nut, which besides the locking wedge, is the only loose member of the assembly.

To demount the rim it is only necessary to remove the nut, revolve the rim back until the straight faces of the adjusting wedges contact, when the wedges will clear one another, and the bevels be separated, when the rim is easily pulled off.

Starter and Low-Speed Carbureter

Using gasoline, kerosene, or acetyline as a fuel, and being adapted to run the engine economically at low speeds, the Wackenmuth starter and slow-speed auxiliary carbureter, Fig. 6, is designed to start the motor, permit the use of a larger carbureter than otherwise, and to use low-grade distilates and kerosene as fuel. The starting device consists of a cylinder pump, P with a throttle at T, and a by-pass B leading from the supply tube S to the injector tubes I, which lead to the spark plugs of the motor. These are of special construction, having a gas passage and ball check-valve, as shown. M, the gasoline mixer, which is applied to the regular carbureter, is connected to the supply pipe of the starter. X, the acetyline mixer, for the purpose of mixing gas with air, may be connected also to the starter, with the gasoline mixer, through a three-way valve. To start, the throttle T is closed by means of the attached control rod, and the hand pump worked, to charge the cylinders with gas. The engine is then started on the spark, and the throttle opened. To run on kerosene, the mixer is applied to an independent float chamber. Fredrick Wackenmuth, Newark, N. J., is the manufacturer.

Duryea's Starter

In use on the Duryea Buggyaut, the starter shown in Fig. 4, consists of an arm turning on the crankshaft next the flywheel, with a pawl at its extremity, which engages with slots in the periphery of the flywheel. To this arm is attached a steel band, held normally away from the wheel by its own spring, and attached to a cord, which is connected with a spade handle convenient to the driver's hand. In operation, the handle is pulled to start the motor, the arm being drawn around an arc of approximately 180 degrees, the pawl engaging with the flywheel, and turning it over one compression. This is equal to one crank turn, and may be repeated as many times as desired, the pawl being disengaged from the flywheel on returning to

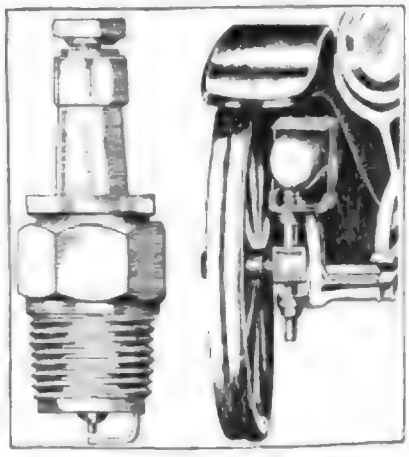


FIG. 3—BEHEN PLUG AND KLENKE SUSPENSION

the lower point on the circumference, where it strikes a lug, which raises it from the slot. This action prevents harmful results from a back fire.

Klenke Pneumatic Suspension

By moving the resilient element from the tire of the wheel to the protected position afforded by the location shown in Fig. 3, the suspension device which is the product of the Klenke Pneumatic suspension Co., New York, is offered as a substitute for pneumatic tires. Its application to the front wheels is shown in the figure. The wheel spindles are secured to the king bolt, which slides in the axle yoke, a pneumatic rubber cushion being disposed between seats secured respectively to these elements. By this position the cushion is protected from road wear and injury, at the same time imparting the same cushioning effect on the parts above it as pneumatic tires, it is claimed. Applied to the rear axle of a chain-driven car, the cushions are disposed between the axle and the springs; while on the shaft-driven type,

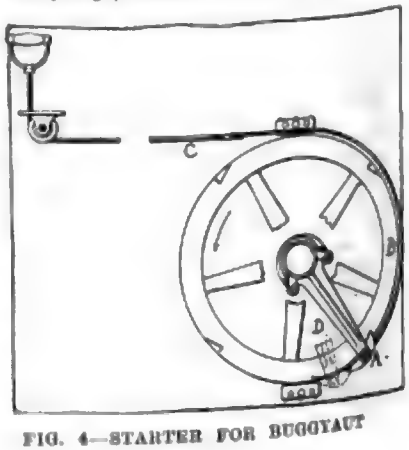


FIG. 4—STARTER FOR BUGGYAUT

Novelties for Use of the Motoring Public

Zenith Carbureter Has Improved Low-Speed Feed Mechanism—Novel Air Valve for Hupmobile Carbureter—Flat Canvas Pail Solves Water Problem

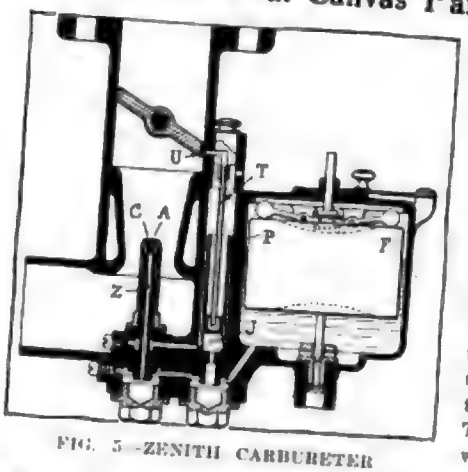


FIG. 5—ZENITH CARBURETER

the whole axle system is changed. The differential is carried amidships, as a sprung member, driving to the wheels by individual shafts, the cushions being interposed between the springs and the axles. The pressure in the cushions is obtained by inflation in the same manner as a pneumatic tire.

Zenith Carbureter Improvements

The Zenith carbureter, described in the Readers' Clearing House columns of Motor Age in the issue of June 27, 1912, has undergone slight improvements in the device which supplies gasoline for light running. In Fig. 5, is shown the improved mixer. A dual concentric main nozzle, Z, is supplied direct from the float chamber, F, through its center aperture, C, and from a compensating open well, at J, for the annular aperture about the central portion of the nozzle, A. The secondary supply, being open to the atmosphere, is dependent upon gravity alone for its pressure. This provides a relatively rich mixture for low speeds and when running slowly, which becomes impoverished as the speed increases. The direct nozzle is directly affected by the engine suction and tends to compensate the action of the other; to provide correct mixture for all speeds. For starting and very low speeds, such as idling, an auxiliary jet, U, is provided in the throat of the carbureter. The action is restricted to very slight throttle openings, when the suction at the main nozzle is very low, but at the small opening at the auxiliary nozzle, U, great enough to raise the gasoline from its normal level in the well, J, through the supply tube, T. The improvement consists of a secondary well, P, whose purpose is to measure the supply for slow motor speeds.

Another improvement, which is for the special instrument furnished by the Zenith company for the Hupmobile car, consists of a rotary-sleeve air valve. This valve, Fig. 8, consists of a rotary slotted sleeve, which may be adjusted to close the air intake port in the mixing chamber, to open it and the hot-air intake, which leads to an exhaust pipe connection, or to register with the cold air port in the valve body. The interior of the tube forms the hot-air passage.

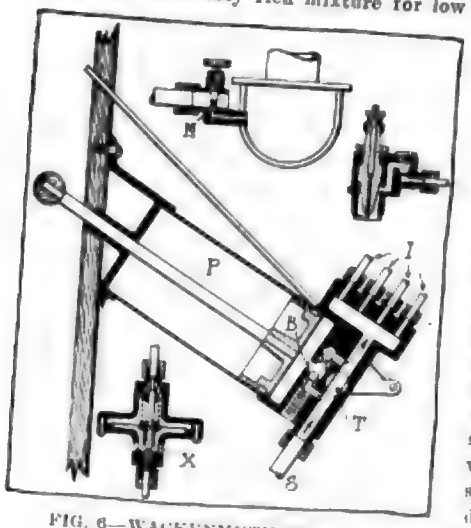


FIG. 6—WACKENMUTH STARTER

Behen Spark Plug

Marketed by the Behen Automobile Equipment Co., St. Louis, Mo., and manufactured by the Jeffery-Dewitt Co., Detroit, the Behen Spark Plug, is shown in Fig. 3. The insulation is of porcelain, with meteor steel electrodes. The cap is crimped on by a special process, and the binding nut is arranged to take all brands of slip or ring terminals, being made of case hardened steel. The plug is made in standard taper threads.

Novel Sales Method

Models to illustrate the operation of mechanical devices are not new, but the use to which the model in Fig. 1 is put is rather unusual. From its size, as compared with the fingers of the demonstrator, one is at a loss at first to identify the device, its scale of reduction being so great as to be somewhat deceiving. The Billings & Spencer Co., Hartford, Conn., having embodied improvements in their line of drop hammers, which were of such nature that their operation required to be shown in order to be appreciated, determined to send out samples with their salesmen. As a full-sized drop hammer weighs several tons, it was decided that such would somewhat inconvenience the demonstrator who desired to have his samples with him, and a number of models were made, one of which is shown in the figure. The feature that was desired to be shown in operation consists of an improved board clamp that makes unnecessary the usual latch and connections at the side for holding the ram suspended. This device is located at the extreme top, above the friction rolls, where it is free from grease, and consists of a powerful clamp, operated by the lever on the left leg of the frame.

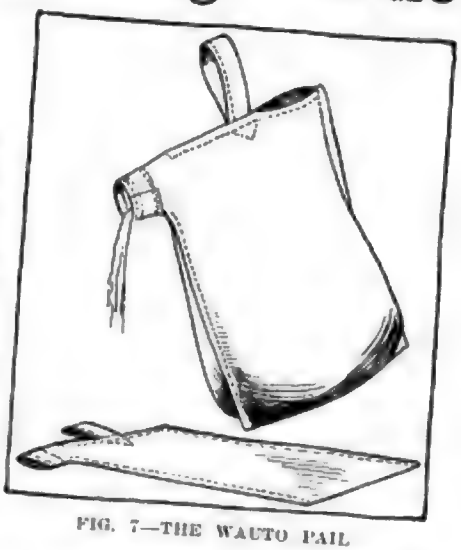


FIG. 7—THE WAUTO PAIL

Folding Water Pail

Every motorist at some time has had the embarrassment of being in need of water, when out on a country road, without adequate means of carrying it. Numerous folding pails have been offered from time to time to fill this need, many of which were made of canvas. The Wauto Pail Co., New York, is one of the first to offer a substantial canvas pail of 2 gallon capacity, which dispenses with a funnel, and folds perfectly flat, being adapted to storage beneath a seat cushion. The Wauto pail is made entirely of canvas, as is shown in Fig. 7, and when not in use, consumes a negligible amount of space. The small size of the opening at the top prevents splashing in carrying.

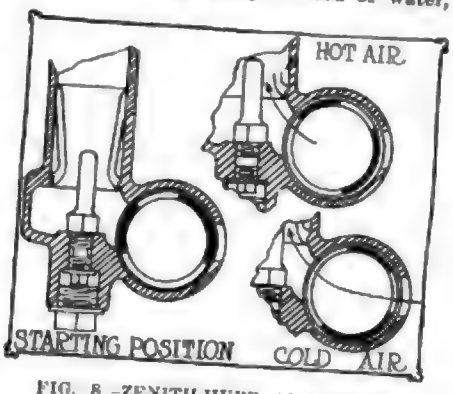


FIG. 8—ZENITH-HUPP AIR VALVE

Brief Business Announcements

Recent Agencies Appointed by Car and Truck Manufacturers

PLEASURE CARS

Towns—	Agent	Car
Abilene, Tex.	C. N. Manly	Franklin
Albany, N. Y.	C. S. Ransom	Lozier
Albany, N. Y.	Park Garage Co.	Hupmobile
Albany, N. Y.	Northern Motor Car Co.	Stutz
Aledo, Ill.	E. B. Miller	Moon
Amboy, Ill.	Andrew Aschenbrenner	Franklin
Boston, Mass.	B. W. Atwood	Mora
Boston, Mass.	R. & L. Co.	Garford
Boston, Mass.	Tyler Motor Car Co.	Little
Boston, Mass.	Anderson Mfg. Co.	Detroit
Bradford, Pa.	Smith Agency	R.C.H.
Brocton, Mass.	Buick Motor Car Co.	Buick
Cambridge, Md.	E. J. Brannock	Detroiter
Chestertown, Md.	J. W. Russell	Detroiter
Crisfield, Md.	L. S. Nock	Detroiter
Charleston, Mo.	Luke Howlett	Moon
Columbus, O.	Warren and Southwick Co.	Cutting
Columbus, O.	Warren and Southwick Co.	Imperial
Columbus, O.	Cummins Auto Sales Co.	Krit
Columbus, O.	Glancy & Sellas	Rambler
Coshocton, O.	Charles W. Loos & Sons	Ford
Coshocton, O.	Charles W. Loos & Sons	Overland
Coshocton, O.	Charles W. Loos & Sons	Rambler
Coshocton, O.	Standard Auto Co.	Imperial
Decatur, Ill.	North Main Street Garage	Moon
Harrisburg, Ill.	Charles V. Parker	Moon
Havre de Grace, Md.	Sanders Machine Shop	Detroiter
Kinderhoo, N. Y.	George H. Brown & Bro.	Studebaker
Lawrence, Mass.	Lambert Mrin Motor Vehicle Co.	R.C.H.
Memphis, Tenn.	Chickashaw Motor Car Co.	Moon
Martinsburg, W. Va.	Shenandoah Garage	Detroiter
Pekin, Ill.	O. L. Cottingham	R.C.H.
Petersburg, Va.	George B. Carter	Detroiter
Ravena, N. Y.	Snyder Bros.	Studebaker
Rice Lake, Wis.	Crisler & Co.	R.C.H.
Rosenberg, Tex.	Rosenberg Motor Car Co.	Moon
Seattle, Wash.	I. D. Lundy Co.	R.C.H.
St. Louis, Mo.	J. D. Lewis	Moon
St. Louis, Mo.	Bond Automobile Co.	Glide
Sioux City, Ia.	Bennett Auto Supply Co.	Moon
Taylor, Tex.	Prewitt Auto Co.	Moon
Taneytown, Md.	George W. Demmitt	Detroiter
Temple, Tex.	J. E. Brown	R.C.H.
Texarkana, Ark.	Paul Jones	Moon
Toledo, O.	Moon Sales Co.	Moon
Portsmouth, Va.	A. E. Harmon	Detroiter
Punxsutawney, Pa.	G. Frank Porter	Moon
Utica, N. Y.	Westcott Garage Co.	Lozier
Utica, N. Y.	I. R. Gardiner	Elmore
Winchesta, Va.	E. A. Rogers	Detroiter

TRUCKS

Town	Agent	Make
Baltimore, Md.	Norwood Bros., Inc.	Veerac
Boston, Mass.	Westfield Motor Truck Co.	Westfield
Boston, Mass.	B. W. Atwood	Adams
Calgary, Alberta	H. H. Kerr	Kisselkar
Carbondale, Ill.	Charles F. Hamilton	Kisselkar
Erie, Pa.	Stirling Bros. Co.	Lippard-Stewart
Jersey City, N. J.	B. & H. Garage	Kisselkar
Marinette, Wis.	Myron R. Churchill	Kisselkar
Mineral Wells, Tex.	L. M. Dunn	Kisselkar
Mont'l, Que., Can.	J. D. Lapointe	Kisselkar
New Rochelle, N. Y.	H. A. Fuller & Co.	Kisselkar
Phoenix, Ariz.	Wesley A. Hill	Kisselkar
Portsmouth, O.	David Stahler	Lippard-Stewart
Regina, Sask., Can.	D. L. Boureau	Kisselkar
San Angelo, Tex.	W. A. Bell	Kisselkar
Syracuse, N. Y.	George Finck	Kisselkar
Salisbury, Md.	L. D. Collier	Kisselkar
Utica, N. Y.	I. R. Gardner	Krebb

DEFIANCE, O.—A. G. McClary is building a modern garage 44 by 132 feet.

Brockton, Mass.—The Boston branch of the Buick Motor Car Co., has opened a branch in Brockton and George H. Connor has been sent here to manager it.

St. Louis, Mo.—The Locomobile Co. of America will open a factory branch in St. Louis, with A. L. Ellwood as manager. The office and salesroom is located on Locust street.

Detroit, Mich.—C. E. Havens has resigned his position as manager of the technical and service department of the Abbott Motor Co. and is taking an extended vacation in an effort to recover his health.

Omaha, Neb.—The Drummond Motor Co., which handles G. M. C. trucks, has just moved into its new garage at Twenty-sixth and Farnum streets. The Drummond Company, formerly the Drummond Carriage Co., has occupied the same corner at Eighteenth and Farnum streets for 24 years.

Racine, Wis.—John H. Dwight, manager of the motor car body and wagon departments of the Mitchell-Lewis Motor Co. of Racine, Wis., has resigned to become president and general manager of the Belle City Malleable Iron Co. of Racine, Wis., which does a large business in supplying motor car manufacturers with castings of all kinds. Mr. Dwight succeeds W. C. MacMahon, who has become vice-president and manager of the Northwestern Malleable Iron Co., Milwaukee.

Toledo, O.—Frederick Seyfang has purchased the Twenty-second street garage and will operate under the name of the Star garage.

Merrill, Wis.—Norman Chilson of Merrill, Wis., is building a three-story addition, 40 by 75 feet, to his garage, making it one of the largest in Wisconsin.

Milwaukee, Wis.—The Essenkay Co. of Chicago has established a Wisconsin branch at 482 Milwaukee street, Milwaukee, with W. A. Knowles as manager.

Milwaukee, Wis.—The Ph. Gross Hardware Co., 126-128 Grand avenue, Milwaukee, one of the largest supply and accessory houses in Wisconsin, is building a ten-story brick and steel store building at 173-177 Third street, a large part of which will be devoted to the wholesale and retail motoring department, now a feature of the extensive business established 60 years ago.

Boston, Mass.—The final arrangements were completed last week whereby the R & L Co. of New York, comprising J. T. and J. A. Rainier, and Paul Lineberger, took control of the Garford business in Boston to operate in connection with the New York agency as a sub branch. The building formerly occupied by the Boston branch of the Thomas Motor Car Co., Boylston street, has been leased and the Garford product, trucks and cars, will be marketed from there. P. C. Chrysler has been placed in charge as manager.

Detroit, Mich.—The Foster Motor Sales Co., state distributor for Cutting cars, has secured the services of T. E. Ball as sales manager.

Detroit, Mich.—Don Ferguson has severed his connection with the Studebaker Corporation to accept the position of chief engineer with the Cartercar Co. of Pontiac, Mich.

Minneapolis, Minn.—L. J. Hadley, vehicle division for the Studebaker corporation of Minnesota, has become manager of the truck sales for the Northwest Kisselkar branch.

Albany, N. Y.—Samuel S. Shaw has been succeeded in the managership of the motor car department of the W. M. Whitney & Co., Albany, by Westcott Berlingame, of Albany, formerly connected with the United Motor Albany Co. Within a few weeks Mr. Shaw intends to incorporate a new company in Albany.

Detroit, Mich.—On October 1, the Studebaker Corporation will take over the new garage and show room at Woodward and Charlotte avenues now occupied by the United States Motor Co., the deal involving a consideration of about $100,000. The Studebaker interests will use the property as headquarters of a recently formed Detroit branch which is at present located at Studebaker plant No. 1 on Piquette street. The new headquarters will be

managed by A. K. McLundy, Michigan sales manager.

Philadelphia, Pa.—The Essenkay Co., manufacturer of a tire filler, has established a branch at 1927 Market street.

Cincinnati, O.—The Republic Tire Co. has opened up a new agency at 915 Race street, Cincinnati, with R. W. Llewellyn in charge.

Philadelphia, Pa.—The James L. Gibney Co. of this city, is remodeling the J. Ellwood Lee plant at Conshohocken for the manufacture of truck tires.

Boston, Mass.—The Page Co., Lynn, Mass., maker of P & P tire filling, has discontinued its branch in Boston, and it will be handled later on an agency basis.

Toledo, O.—The Banting Machine Co., carriage and motor car dealer, will remove from its present location to the new M. O. Baker building, 120-24 Superior street, in a short time.

St. Paul, Minn.—Felix Joswich, of the St. Paul Motor Vehicle Co., has bought the Pence Automobile Co. building, West Fifth street, and will continue the sale of Buick cars in St. Paul.

Detroit, Mich.—Garvin Denby, brother of Senator Edwin Denby, has resigned his position as assistant to the president of the Solvay Process Co., to assume the position of sales manager of the Federal Motor Truck Co.

Buffalo, N. Y.—The Baker Brothers Motor Co., formerly located at 846 Main street, has moved into the building at 1227-1229 Main street, which was formerly occupied by the sales department of the E. R. Thomas Motor Car Co.

Milwaukee, Wis.—The Sternberg Mfg. Co. has opened a direct factory service branch and maintenance bureau in New York city, operated by the Sternberg Motor Truck Co., of New York, at 285 East One Hundred and Thirty-seventh street.

Buffalo, N. Y.—Plans have been completed for the construction of the new home for the Poppenberg Motor Car Co. at Main and Carlton streets. The mansion on the site at present is being razed for the new structure which will be seven stories in height and will extend from Main to Washington streets.

Pittsburgh, Pa.—The Ohio car will be represented in the Pittsburgh territory by the Ohio Motor Sales Co. of Pittsburgh, temporary headquarters having been secured at 5712 Penn avenue, pending the completion of new sales room and service station. The Ohio's new Pittsburgh dealer succeeds the Federal Motor Car Co.

Cleveland, O.—Royal B. Curtiss, who up to September 1 was sales manager of the Royal Equipment Co., resigned his position to accept a district managership of the Chase Motor Truck Co. with headquarters in Cleveland. Mr. Curtiss will have jurisdiction over the following territory: Ohio, West Virginia, Kentucky, Indiana, except the vicinity of Chicago Michigan and Western Pennsylvania.

Washington, D. C.—The National Auto Supply Co. has opened a store at 1530 Fourteenth street, N. W., with Frank G. Fickling as manager.

Denver, Colo.—The Cole Motor Co., Denver distributor for the Cole, has moved into new sales rooms and a service station at the corner of Lincoln and Colfax streets.

Omaha, Neb.—Doty & Hathaway, dealers in the Little Four and Reo cars, have moved into the garage at Twenty-first and Farnam streets, formerly occupied by the Kimball Auto Co.

Milwaukee, Wis.—John J. Krohn, former contracting freight agent for the Wabash system in Milwaukee, has been appointed Milwaukee representative of the motor truck division of the A. O. Smith Co. of Milwaukee.

Boston, Mass.—Wallace G. Page, for several years connected with the Shawmut Tire Co., as sales manager, has become associated with George S. Van Voorhis, in the American Marine Equipment Co., of Boston, dealer in motor supplies and specialties.

Philadelphia, Pa.—Petrey-Cassidy, Inc., selling agents for the Weed chain tire grip, the New York and New Jersey Lubricant Co., Standard Woven Fabric Co., Jones speedometer, etc., for a number of states, has removed from 1416 Vine street to 1427-29 Vine street.

Boston, Mass.—The Boston agency for the Franklin cars has been moved from 31 Irvington street to 733 Boylston street in the salesrooms formerly occupied by the Marquette company. The company is considering plans for a large building on Commonwealth avenue.

Baltimore, Md.—The Goodyear Tire and Rubber Co. branch in this city, Frank M. Olmstead manager, is erecting a new building at the northeast corner of Cathedral and Preston streets. The building will be fireproof throughout and will be of two stories and basement. It will have a frontage of 32 feet and a depth of 100 feet.

Boston, Mass.—B. W. Atwood, for some time with the Curtis-Hawkins Co., agent for the Speedwell, has gone into business for himself, having taken on the agency for the Mora car and the Adams truck. He is located now at 1000 Boylston street, sharing the same salesrooms with the Williams Brothers, who handle the Carter-cars.

Boston, Mass.—The Baker commercial and pleasure vehicles are now being handled under the same roof in Boston though by distinct agencies, A. F. Neale, who has the pleasure cars and Frank A. Phelps who handles the commercial line having moved their quarters, Neale from the Motor Mart and Phelps from 17 Harvard street to the former salesrooms of the King agency, corner of Boylston and Fairfield streets.

Milwaukee, Wis.—The Milwaukee Auto and Tire Exchange, 461 Broadway, Milwaukee, has been appointed agent for Swinehart tires.

Westfield, Mass.—The Westfield Motor Truck Co. has opened a factory branch at Boston at 287-293 Northampton street with George L. Cooke in charge as manager.

St. Paul, Minn.—The Studebaker Corporation has opened its St. Paul headquarters in the former German Evangelical church on West Sixth street. R. A. Briggs is manager.

Detroit, Mich.—C. L. Morgan, formerly sales manager of the electric division of the General Motors Truck Co., has resigned to take a position with the Moon-Hopkins Billing Machine Co. of St. Louis.

Boston, Mass.—Louis Sackett, recently appointed manager of the Boston branch of the Oakland, has resigned and the branch is being conducted now by Fred Walsh, sales manager of the branch for some years.

Niagara Falls, N. Y.—Plans have been completed by George L. Gaiser for the construction of a completely equipped garage to cost $50,000. Property in Main street, 220 by 66 feet, has been purchased, the consideration being $15,000.

Detroit, Mich.—The Grant Brothers Auto Co. has secured the sales and distributing agency for the Lozier cars in Detroit and surrounding territory. In making this change the Lozier company gives up its factory branch on Jefferson avenue. The Grant sales rooms are on Woodward avenue which is a superior location to the former show rooms of the Lozier car.

Boston, Mass.—The Tyler Motor Car Co., formed by Frank J. Tyler and his brother Lucius, both of whom were prominent in the affairs of the United Motors Boston Co. until recently, has secured quarters in the Motor Mart formerly occupied by the Buick company and for a starter has taken on the Little roadster, which is made in Flint, Mich.

Baltimore, Md.—The Schall-Crouch Auto Co., of this city, headed by Percy W. Schall and Harry M. Crouch, has closed a contract for the agency in Baltimore and the counties of Maryland of the Lozier. This company is located at North and Mount Royal avenues and also is the representatives in this section for the Paige-Detroit car.

San Francisco, Cal.—Fred W. Hauger, several years assistant manager of the Haynes Auto Sales Co. of this city, has been named as manager of the Oakland branch of the Haynes. The Haynes business in this territory is now conducted as a direct factory branch, under the general management of W. B. Cochran. C. H. Haynes, a brother of Ellwood

Haynes, has been appointed treasurer under the reorganization.

Utica, N. Y.—I. R. Gardner is planning the construction in this city of a large garage.

Detroit, Mich.—J. I. Clarke, formerly with the Boston Post, has taken a position in the advertising department of the Chalmers Motor Co.

Minneapolis, Minn.—J. E. Kemp and D. W. Kemp have opened the Electric Service garage, at Bryant and Hennepin avenues, for the care of electric machines solely.

Washington, D. C.—Miller Brothers, agents for the Stutz, have leased 1026 Connecticut avenue, N. W., formerly occupied by the Goodyear Tire and Rubber Co., and after extensive improvements will take possession.

Waterbury, Conn.—Michael Norton, prominent in the taxicab business at Providence, R. I. and other places, has completed arrangements for a new company at Waterbury, of which he will be treasurer and the controlling stockholder.

Davenport, Ia.—A. Leberman and G. V. Davis have taken over the Davenport Auto Co., 114 West Fourth street, up to to the present time under the management of Steinhauer & Frey. They will handle the Krit and Apperson and run a taxi line.

Detroit, Mich.—The Peninsular Steel Castings Co., a newly organized concern, which will manufacture crucible steel castings under the Nice furnace patent, has purchased the property formerly occupied by the Michigan Bolt and Nut Works for a consideration which is not made public. The property, which is appraised at $52,000, fronts 371 feet on Iron street and 100 feet on Wight street. The building has a length of 235 feet.

Philadelphia, Pa.—The local branch of the Polack Tire Co. will remove from its present headquarters on North Broad street to 1803 Market street.

Phoenix, Ariz.—R. Alyn Lewis has secured the Arizona agency for Essenkay. He will establish headquarters here and branches throughout the state.

Cincinnati, O.—The Bond Hill Auto Service Co., of Cincinnati was incorporated last week with a capital of $2,000. The Cincinnati Automobile Co. was incorporated with a capital of $25,000.

Philadelphia, Pa.—A one-story fireproof addition containing 9788 square feet additional floor space has just been completed by the Packard Motor Car Co. in the rear of the present structure at 317 North Broad street.

Portland, Ore.—C. S. Mantell, formerly manager of the Portland Motor Car Co., has recently taken charge of the sales department of the Michigan Motors Co. of Portland, handling the Havers six and Lippard-Stewart.

Milwaukee, Wis.—The New York Tire and Vulcanizing Co. has been formed at Milwaukee, by Vivian and Bertrand Brownell, with headquarters at 609-611 Wells street. The company will manufacture an inner liner for casings.

Boston, Mass.—The Detroit electric, formerly handled as an agency proposition by James A. Binney in Boston, has been changed over to a branch by the Anderson Electric Co., of Detroit, and Albert Weatherby has been sent to Boston as manager. A new service station has been opened at 25 Irvington street with Nicholas Rommefanger in charge. Mr. Binney has gone into the gasoline field, having taken on the Henderson.

Pittsburgh, Pa.—The National Motor Car Co. has moved into its new show rooms at Baum and Beatty streets, where the National is handled.

Detroit, Mich.—The traveling staff of the Federal Motor Truck Co. has been augmented by George Friend, formerly with the Mitchell Motor Car Co.

Milwaukee, Wis.—The Northern Sales Co. of Toledo, O., general distributor of the Air Friction carbureter, has established a branch sales office and service station at 490 Twelfth street, Milwaukee.

Montreal, Can.—The Hart Accumulator Co. of London, Eng., manufacturer of storage batteries, will establish a factory in western Canada. E. J. Clark, managing director of the company will recommend that a large plant be built at either Winnipeg or Fort William.

Boston, Mass.—The W. L. Russell Co., agent for the Haynes in Boston, and the Regal wholesale and retail for New England, has moved its executive and wholesale offices to the Motor Mart, still retaining the retail branch at 10 Park square. A large section of the second floor of the Motor Mart has been leased and a mezzanine floor built in to give additional room.

Rochester, N. Y.—Arthur McNall has moved into his new garage at South Union street and East avenue. The new place of business has frontage of 85 feet and is three stories in height. The showroom is 42 by 60 feet and is finished with stamped steel ceiling and terrazzo floor. Mr. McNall will continue to handle the Peerless, Chalmers, Rauch & Lang electric and the Peerless truck.

Recent Incorporations

Atlantic City, N. J.—Pierson-Harris Co.; capital stock, $50,000; incorporators, G. Harris and others.

Baltimore, Md.—Automobile Tire Repairing Co.; capital stock, $500; to repair tires; incorporator, L. Vernon.

Boston, Mass.—Motor Service Co.; capital stock, $2,500; incorporators, S. Small, H. Chisholm, W. H. Evans.

Buffalo, N. Y.—Buffalo Resilio Co.; capital stock, $25,000, to manufacture and deal in tire fillers, incorporators, S. D. Noble, A. D. Falck, P. E. Lonergan.

Cincinnati, O.—Bond Hill Auto Service Co.; capital stock, $2,000.

Cleveland, O.—Gerhart Spring Tire Co.; capital stock, $15,000.

Columbus, O.—Pioneer Gasoline Co.; capital stock, $10,000; incorporators, E. J. Cherney and others.

Flint, Mich.—Sterling Motor Co.; capital stock, $300,000.

Harrisburg, Pa.—Economy Tire and Rubber Co.; capital stock, $5,000; incorporators, E. M. Knupp and others.

Indianapolis, Ind.—Martin Tractor Co.; capital stock, $350,000; to manufacture tractors; directors, C. H. Martin, H. R. Richards, E. D. Moore.

Indianapolis, Ind.—Showlater Mfg. Co.; capital stock, $10,000; to manufacture motor car bodies; directors, H. G. Showlater, F. W. Showlater, W. Small.

Indianapolis, Ind.—Glover Equipment Co.; capital stock, $20,000; to manufacture motor car accessories; directors, F. L. Glover, L. Gieger, W. A. Uphrey, L. A. Libkings.

Johnstown, Pa.—United States Motor Sales Co., capital stock, $50,000; incorporators, M. S. Marquis, R. M. Buchanan, J. H. Miller, G. G. Stitzinger, A. W. Reynolds, R. L. McNabb.

Kansas City, Mo.—Rambler Distributing Co., capital stock, $10,000; incorporators, E. C. Ellis, G. D. McIlirath, R. K. Dietrich, H. H. Cook, R. C. Barnett.

Kingston, N. Y.—Rondout Rubber Co.; capital stock, $1,000,000; to deal in crude rubber; incorporators, Henry T. Clews, Frank C. Brennan, C. Tompkins.

Little Rock, Ark.—Newsum Auto Tire Vulcanizing Co.; capital stock, $10,000; to manufacture tires and accessories.

Louisville, Ky.—George L. Waller Co.; capital stock, $5,000; incorporators, George L. Welleg, S. J. Brown, M. S. Howard.

Marlinton, W. Va.—Marlinton Garage; capital stock, $10,000; to deal in motor cars and conduct garage; incorporators, E. T. McClintic, C. A. Yeager, M. E. Pue, G. R. Goodsell, L. S. Shoemaker, G. W. Clark.

New York—Motor and Gear Improvement Co.; capital stock, $1,250,000; to manufacture motor car parts; incorporators, H. C. Derham, S. V. Brady, D. Partridge.

New York—Auto Despatch Bureau; capital stock, $25,000; incorporators, W. Stackhouse, H. Parker, L. S. Parker.

New York—Englebert Tyre Co.; capital stock, $100,000; incorporators, S. K. Kellock, C. B. Campbell, E. W. Elverson.

New York—Miller, Hicks & Hewitt, Inc.; capital stock, $10,000; motor car business; incorporators, H. D. Miller, H. T. Hicks, G. A. Hewitt.

New York—Cameron-Rowe Auto Service, Inc.; capital stock, $10,000; incorporators, J. Cameron, N. Cameron, A. T. Rowe.

New York—Mercedes Daimler Selling Corp.; capital stock, $50,000; to deal in motor cars; incorporators, A. M. Becker, H. A. Lemline, E. H. Ferguson.

New York—Hunt & West; capital stock, $10,000; incorporators, B. R. Law, J. W. Collopy, Jr., E. Z. Parker.

Orangeburg, S. C.—Calhoun Garage; capital stock, $5,000; incorporators, C. R. Culler, N. E. Salley.

Philadelphia, Pa.—James L. Gibney Rubber Co.; capital stock, $300,000; incorporators, J. L. Gibney, John L. Gibney, J. S. Mack, T. F. Golden, G. B. Shearer, Jr.

Philadelphia, Pa.—Republic Motor Co. capital stock, $50,000; incorporators, V. P. brow Baker, S. S. Muxsey, Paul Gulifoil

Philadelphia, Pa.—V. P. Padula Motor Co. capital stock, $50,000; incorporators, V. P. Padula, F. C. Bishop, G. M. Hubbard.

Peoria, Ill.—Jefferson Automobile Co. capital stock, $30,000; general agency and garage; incorporators, R. C. Uckena, F. E. Howlang, F. I. Archdale, W. G. Rounneberg, C. Howland.

Rochester, N. Y.—Lamay Mfg. Co.; capital stock, $25,000; to manufacture motors, etc.; incorporators, A. B. Headley, P. E. Tucker, A. C. Lamay.

San Angelo, Tex.—S. L. Henderson Co. capital stock, $10,000; to deal in motor cars and conduct repair shop; incorporators, S. L. Henderson, J. S. Allison, G. S. Allison.

St. Louis, Mo.—Engine Starter Co.; capital stock, $50,000; directors, G. Heitz, A. A. Eicks, George W. Owens, L. H. Mesker.

St. Louis, Mo.—Lewis Automobile Co. capital stock, $16,000; incorporators, J. D. Lewis, W. H. McLean, J. H. Jackson.

St. Louis, Mo.—Kaufmann Motor Truck Co. capital stock, $15,000; incorporators, E. Kaufmann, G. H. Muehling, N. J. Sadler.

Wellsburg, W. Va.—Brooke Auto Co.; capital stock, $10,000; incorporators, J. H. Scott, C. M. Magee, P. A. Chapman.

Wilmington, Del.—Auto Service and Supply Co.; capital stock, $15,000; incorporators, F. A. Webb, B. I. Bothe, A. Hindle.

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MOTOR AGE

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MOTOR AGE

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MOTOR AGE

DePalma's Name Goes on Vanderbilt Cup

Mercedes Driver Defeats Hughes in Mercer by 43.3 Seconds in Classic at Milwaukee, Averaging 68.9 Miles an Hour—Tetzlaff, Leading for Twenty-Six Laps, Breaks Jackshaft—No Accidents Mar Sport

DE PALMA, VANDERBILT WINNER, AND PREVIOUS WINNERS OF THE CLASSIC

By Darwin S. Hatch

MILWAUKEE, Wis., Oct. 2—Special telegram—Ralph de Palma in a Mercedes car won the eighth annual Vanderbilt cup race over the Wauwatosa course here this afternoon at an average speed of 68.9 miles per hour, defeating Hughes in the Mercer Special by the narrow margin of 43.3 seconds. Wishart in a Mercedes came in third.

De Palma Hoodooed No Longer

By his winning of the classic today, de Palma proved that he had effectually broken the hoodoo that had pursued him so persistently until the Elgin races last August. In fact it seemed that the jinx had descended upon Tetzlaff today for the Californian, after holding the lead from the start for the first 200 miles of the 300-mile race, was put out with a broken driveshaft when victory was almost in sight, much in the same way that de Palma lost the 500-mile race at Indianapolis last Memorial day. De Palma drove conservatively and the average he made was almost identical with the pace that won him two firsts at Elgin, when he won the Elgin trophy and free-for-all.

Of the nine cars entered to start this morning, eight lined up for Starter Wagner's signal at 11 o'clock. Pullen's Mercer had been disqualified for being oversize. Five of the starters finished in the order named: De Palma, Hughes, Wishart, Anderson in a Stutz and Clark in a Mercedes. Mulford in a Knox special and Tetzlaff in the Fiat fell by the wayside, while Nelson in the Lozier was still running when the race was called.

Three in the Fight for First

The fight for first place was among Tetzlaff, de Palma and Hughes until the Fiat went out and left the Italian and the Englishman to fight it out to the finish. That it was a close fight is evidenced by the fact that there was only a fraction of a minute between them after the four hours and 20 minutes of running. De Palma's time for the thirty-eight laps of the 7.9 mile course was 260 minutes 31.54 seconds, averaging 68.9 miles. Hughes' time was 261 minutes 14.24 seconds, averaging 68.8 miles per hour, only 1-10 of a

DE PALMA, WINNER OF THE VANDERBILT ON SOUTH POND DU LAC ROAD OF MILWAUKEE'S WAUWATOSA COURSE

Lap-by-Lap Description

mile an hour slower than de Palma. Wishart went the distance in 276 minutes 35.75 seconds. Anderson in 279 minutes 40.95 seconds and Clark in 291 minutes 39.75 seconds. Mulford in the Knox went only two laps when magneto trouble put him out. Nelson was so far behind he retired in the twenty-sixth lap.

In spite of the difficulties in preparing the course which, with the heavy rains, caused the postponement of the race last week, the Wauwatosa track was in fine condition today. There was not an accident of any nature connected with the running of the classic. The road was well policed, the crowds well handled and the promoters seemed to have the affair very well organized. Stops at the pits were rare, as the tires seemed to hold up well.

Fast Time a Surprise

By reason of the excellence of the course the time made was much better than was looked for by the officials of the meet, although no records were broken. Tetzlaff's fast lap of 6:15, equal to a speed of 75.7 miles per hour, opened the eyes of the crowd as to what speed could be made for one lap.

As de Palma crossed the finish line he was hailed by the plaudits of the 50,000 spectators gathered in the grandstand and in the parking spaces around the course. De Palma drove a consistent race and victory was deserved, coming for the second time in his career in the space of a few months.

Two of the cars in the race were equipped with wire wheels, and both finished with honors—Hughes, whose Mercer was fitted with wire wheels, and Anderson in the Stutz, which was likewise equipped with the same style.

TELEGRAPHIC TABLE OF TIMES BY LAPS IN EIGHTH RUNNING OF VANDERBILT CUP RACE AT

No.	Car	Driver		1 7 miles 4658 feet	2 15 miles 1036 feet	3 23 miles 3414 feet	4 31 miles 2792 feet	5 39 miles 2170 feet	6 47 miles 1548 feet	7 55 miles 926 feet	8 63 miles 304 feet	9 70 miles 4982 feet	10 78 miles 4360 feet	11 86 miles 3718 feet	12 94 miles 3096 feet	13 102 miles 2474 feet	14 110 miles 1852 feet	15 118 miles 1230 feet	16 126 miles 608 feet
22	Mercedes	De Palma	Elapsed time	6:51	13:42	20:11	26:52	33:41	40:30	46:52	53:42	61:17	68:00	6:37	6:36	6:31	6:40	10:16	6:41
			Lap time	6:51	6:51	7:29	6:41	6:39	6:38	6:43	7:50	7:35	6:53	6:48	6:42	6:52	6:45	6:44	6:44
23	Mercer—Special	Hughes	Elapsed time	7:13	14:04	22:37	29:59	36:32	43:47	50:39	57:25	64:16	71:06	83:51	91:08	101:22	110:11	116:53	123:30
			Lap time	7:13	6:51	8:33	7:22	6:33	7:15	6:52	6:56	6:51	6:50	6:32	10:08	6:45	6:37	6:12	6:53
26	Mercedes	Wishart	Elapsed time	6:52	13:14	21:33	27:59	34:23	40:48	47:15	53:46	60:22	66:53	74:37	81:13	87:44	94:24	104:34	111:15
			Lap time	6:52	6:62	8:19	6:26	6:24	6:25	6:27	6:31	6:36	6:31	7:21	8:24	7:15	7:14	7:14	7:16
27	Stutz	Anderson	Elapsed time	7:23	14:32	21:40	28:46	35:54	43:02	50:12	57.21	64:25	71:36	69:45	76:08	82:33	89:01	95:18	101 41
			Lap time	7:23	7:09	7:08	7:06	7:08	7:08	7:10	7:09	7:08	7:07	7:05	7:14	10:14	8:49	6:42	6:37
28	Mercedes	Clark	Elapsed time	7:13	14:05	20:58	28:05	35:52	44:53	52:00	61:14	69:44	76:49	73:25	85:33	90:18	96:55	103:07	110.06
			Lap time	7:13	6:42	6:53	7:07	9:47	7:01	7:07	9:14	8:30	7:05	8:51	10:37	8:25	8:38	8.44	8:59
25	Lozier	Nelson	Elapsed time	7:32	13:38	22:20	34:41	46:51	65:28	74:43	82:46	91:34	100:14	77 54	84:40	91:32	98:17	105:01	111:45
			Lap time	7:32	6:06	8:42	12:21	12:10	18:37	9:15	8:03	8:48	8:40	6:23	6:23	6:25	6:28	6:17	6:23
29	Fiat	Tetzlaff	Elapsed time	6:27	12:42	19:00	25:15	31:34	37.56	44:16	50:46	57:03	63:22	109.05	119:42	128:07	136:45	145:39	153:59
			Lap time	6:27	6:15	6:18	6:15	6:19	6:22	10:20	6:24	6:23	6.19	78:57	86:11	93:26	100:40	107:54	115:10
24	Knox—Special	Mulford	Elapsed time	6:31	13:17								Out: magneto trouble						
			Lap time	6:31	6:46														

TETZLAFF, WHO MADE BOLD BID FOR THE VANDERBILT, BEATING IT ON WAUWATOSA HOMESTRETCH

# of Vanderbilt Cup Race

L. V. Spencer

DE PALMA in his Mercedes was the first to line up at the tape. Hughie Hughes in the yellow Mercer was beside him. Back of them were Mulford in the Knox and Nelson in the Lozier. The third pair consisted of Wisbart in Mercedes 26 and Anderson in his Stutz. Clark, who disabled his car at Elgin, was at the wheel of the third Mercedes, and he, together with Tetzlaff, in the lone Fiat, brought up the rear of the lineup of cars.

Pullen, who was to have driven Mercer 21, was disqualified by the technical committee yesterday because the piston displacement of his car was below the necessary 301 cubic inches. This brought the number of starters down to eight.

De Palma Gets Slow Start

De Palma got a bad start and did not jump into motion as he usually does. Although his start was slow, he quickly shot away amid the cheers of the 50,000 spectators and the race was on. Hughie Hughes came in for an equal amount of cheers, and was off like a shot. The others came in for a like amount of applause and were off in the order mentioned without the slightest hitch.

Tetzlaff, the last to start, was easily a favorite with the vast throng. It was as if they looked to him to carry off the Fiat honors for himself as well as for his dead team mate.

On the first lap, de Palma, Hughes and Mulford were running about even, although Mulford appeared to be gaining. Wishart came next, having passed Nelson. Tetzlaff followed and was trailed by Clark. Tetzlaff tore past the stand, and made the fastest lap of the bunch, completing

MILWAUKEE, WIS, OCTOBER 2, WON BY DE PALMA IN A MERCEDES AT 68.9 MILES PER HOUR

17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	Position at finish	Miles per hour
133 miles 3266 feet	141 miles 4644 feet	149 miles 6022 feet	157 miles 7400 feet	165 miles 2778 feet	173 miles 2156 feet	181 miles 1534 feet	189 miles 912 feet	197 miles 290 feet	204 miles 4848 feet	212 miles 4226 feet	220 miles 3604 feet	228 miles 3087 feet	236 miles 2400 feet	244 miles 1838 feet	252 miles 1216 feet	260 miles 594 feet	267 miles 2352 feet	275 miles 4630 feet	283 miles 4008 feet	291 miles 3386 feet	299 miles 2764 feet		
117 46	124 12	130 38	137 16	143 41	151 41	158 12	164 52	171 [illegible]	177 [illegible]	183 55	190 29	199 44	206 31	214 01	220 45	227 26	234 00	240 33	247 15	253 59	260 31.54		
6.31	6.26	6.26	6.38	6.25	8.06	6.26	6.19	6.31	6.40	6.24	6.32	9.15	6.47	8.24	6.44	6.41	6.54	6.33	6.42	6.44	6.32		
118 28	125 10	132 52	138 53	145 26	153 26	160 22	167 10	174 00	180 46	187 28	194 41	201 34	208 11	214 49	221 24	228 04	234 44	241 19	247 54	254 32	261 14.24	1	68.9
6.42	6.42	6.42	6.41	8.47	8.06	6.56	6.42	6.50	6.46	6.42	7.02	6.52	6.37	6.38	6.35	6.40	6.40	6.35	6.35	6.38	6.42		
116 45	123 37	130 32	136 24	146 16	153 01	162 05	168 57	175 28	182 20	189 21	196 12	207 06	212 52	220 37	227 26	239 61	248 58	262.36	269.36	269.36	276.35.75	2	68.8
6.40	6.42	6.45	9.12	6.52	6.18	9.01	6.52	6.41	6.57	6.49	6.48	10.54	5.46	6.45	7.49	12.25	9.07	6.40	6.58	7.00	6.59		
122 27	129 42	137 14	144 21	151.32	159 02	168 51	176 11	183 28	190 46	198 08	205 21	212 05	222 24	229 34	236 42	243 53	250 57	258.12	265.21	272 30	279.40.95	3	64.9
7.17	7.15	7.39	7.02	7.11	7.37	9.42	7.20	7.17	7.17	7.20	7.17	7.23	9.22	7.19	7.08	7.11	7.04	7.15	7.09	7.09	7.11		
130 1	138 18	145 51	152 28	159 14	166.25	172.04	179.57	186.32	193.17	200.08	206 53	214.03	221.25	231.15	238.28	245.22	252.19	259.42	268.46	275.38	291.39.75	4	64.2
6.46	8.35	7.33	7.37	6.44	7.11	6.58	6.55	6.55	6.45	6.51	6.45	7.10	10.22	7.08	6.56	6.54	6.57	7.23	9.04	6.52	6.01		
162 30	171.40	179 30	190 16	199 24	208 16	217 31	227.06	240.40	259 10	Withdrawn												5	61.6
8.31	9.16	7.50	10.46	9.08	8.46	9.15	10.32	12.35	9.30														
108.07	114 32	121 04	129 39	136.07	142 37	149.06	155.41	164.11	Out—Broken jackshaft														
6.26	6.25	8.31	8.35	6.28	6.30	6.24	6.40																

the circuit at the rate of 73.4 miles an hour.

Mulford passed Hughes in the second lap, but de Palma was still well in the lead. Hughes had tire trouble and was forced to stop at the pit. Tetzlaff gained on the others, passing Anderson, and making the lap at the terrific average speed of 74.6 miles an hour.

On the third lap Tetzlaff was in the lead, closely followed by de Palma. Then came Clark, Wishart, Anderson, Hughes and Nelson in the order named. Mulford was held up on the back stretch for magneto trouble.

Mulford Out of It

The next lap saw no change in the positions of the two leaders, although Wishart changed places with Clark. The others retained their third lap positions, Mulford bringing up the rear.

On his fourth lap, Nelson stopped at pit on account of engine trouble. He was obliged to stop for 3 minutes on the back stretch for the same reason. Mulford was again forced to stop in his fifth lap for magneto trouble. The trouble proved of such serious nature that Mulford was obliged to quit the race.

Clark was forced to stop on the back stretch in his fifth lap, which put him in fifth place and gave his old position to Anderson in the Stutz. The leaders remained in their same positions, namely, Tetzlaff first, de Palma second, Wishart third, and Anderson fourth. On his sixth lap Nelson's Lozier developed brake trouble which put him out of the running, although on the stretches he appeared to be going well.

On the ninth lap, Tetzlaff was still way ahead, his average for the distance being 74.9 miles an hour. De Palma, still second in the seventh lap, has covered a distance of 55 miles at an average speed of 70 miles per hour.

BRAGG IN GRAND PRIX FIAT PRACTICING FOR NEXT SATURDAY'S CLASSIC

It was in the ninth lap that Wishart in Mercedes 26 succeeded in nosing de Palma out of second position. This Wishart held for three more laps, but on the twelfth he was forced to stop at the pit to change a tire. This gave the second place to de Palma again. All this time Tetzlaff was fairly burning up the course, completing twelve laps or nearly 95 miles at an average speed of 75.4 miles an hour, which pace he seemed able to hold.

Wishart Passes De Palma

In the fifteenth lap, Wishart again forged ahead of de Palma. The latter was forced to stop at the pit to replace a tire. While at the pit, he also took this opportunity to replenish his oil and gasoline tanks. This allowed Wishart a lead of 22 seconds over de Palma, these two cars furnishing a neck and neck race so far.

From the ninth lap through the first half of the race, or about 150 miles, Hughes ran consistently in fourth place, while Anderson in the Stutz, Clark in the Mercedes and Nelson in the Lozier brought up the rear.

As to the three leaders, no change in their respective positions occurred from the fifteenth lap on through the nineteenth, or the century and a half mark.

Considerable tire trouble had developed so far in the race, although up to this time Tetzlaff was not troubled in this respect. On his nineteenth lap, however, he slowed up at the pit to the dismay of the crowd. A left rear tire was replaced and at the same time water, gasoline and oil were taken on.

On his twelfth lap Clark lost time by misjudging his stop at the pit, being obliged to back up. He changed both rear tires and also took on gasoline. De Palma's rear tire had to be changed on the fifteenth round, which consumed 39 seconds.

Laps twenty and twenty-one were troublesome for several of the drivers, although they made remarkably quick tire changes at the pits. Wishart took 28 seconds to replace a rear tire, a speed record for this operation.

Tetzlaff Looks a Winner

At the start of the second half of the grind, Tetzlaff looked like a sure winner, he being 7 minutes ahead of his nearest rival, Wishart.

At the beginning of the twentieth lap, the contestants stood Tetzlaff, de Palma, Hughes, Wishart, Anderson, Clark and Nelson. This order held for the next lap, but in the twenty-second Hughes relinquished his position to Wishart. The former was obliged to stop at the pit for gasoline, oil and water. Hughie, however, hit it up after thus rejuvenating his car and regained his former position in third place on the twenty-fourth lap. The other cars maintained their position as at the start of the second half.

BERGDOLL IN GRAND PRIX BENZ ON NORTH FOND DU LAC STRETCH

PRACTICE PICTURE SHOWING TETZLAFF CATCHING CHANDLER IN FALCAR

On the twenty-second lap, Anderson was obliged to stop at the pit for oil and gasoline, while in the twenty-third Wishart had to stop to replace a front tire.

Tetzlaff's average speed for twenty-five laps was 72 miles an hour; de Palma's, 69.1; Hughes, 67.9, and Wishart's, 67.4.

It was in his twenty-sixth lap that misfortune overtook Tetzlaff, when the driveshaft of his big Fiat broke on the back stretch, putting him permanently out of the race. After going 205 miles at an average speed of nearly 73 miles an hour, he was obliged to sit by the wayside and see the honors go to one of his rivals, after it seemed almost certain that the race was his. Tetzlaff's hard luck recalled de Palma's fate at Indianapolis last June, and there was a murmur of dismay from the crowd when the husky voice of the announcer proclaimed that Teddy Tetzlaff, easily a favorite with them all, was out of the running for keeps.

Tetzlaff's fastest lap, and which proved to be the fastest lap of the race, was his third when he completed the circuit in 6 minutes 15 seconds, an average speed of 75.7 miles an hour. This was 1.53 minutes faster than the average time of last year's Vanderbilt.

De Palma Assumes Lead

Following Tetzlaff's misfortune de Palma took the lead, never losing the premier position from then on to the end, driving the remaining 94 miles at a daredevil clip.

Tetzlaff out, Hughie Hughes in his Mercer assumed second position. It was only a matter of seconds between him and the leader to the end. Wishart was now third, Anderson fourth, Clark fifth and Nelson sixth.

Excitement was running high, for it was seen that, should anything happen to de Palma, Hughes would be the victor. Only the time required for a tire change separated the leaders. De Palma and Hughes knew this full well. On the back stretch on his twenty-eighth lap, de Palma blew a tire, but this did not materially affect his time, he running to the pit to make the change. On the twenty-ninth lap de Palma led the Englishman by 1 minute 56 seconds.

Misfortune for Three Drivers

The twenty-ninth lap proved disastrous for three of the cars, although from the twenty-sixth on to the end of the race there were no changes of the positions of the contestants. After the twenty-seventh lap the list was cut down to five cars, Nelson in the Lozier in this lap withdrawing from the race because he was too far behind. Wishart was obliged to put a new chain on his Mercedes on the back stretch in the twenty-ninth lap, while in the same lap Clark, Anderson and de Palma were obliged to call at the pits for new tires for the rear wheels.

Again in the thirty-first lap de Palma was forced to stop for a tire change, but Hughes in the following lap had to stop for gasoline and water, which practically evened things up. The other cars were still in the positions which they had held from the two hundred and fifth miles.

Although de Palma and Hughes were traveling at a terrific pace, their speed was considerably below that which Tetzlaff had set earlier in the day. De Palma's average speed for 292 miles was 68.9 miles an hour, about 5 miles less than that of Tetzlaff.

Hughes-de Palma Battle

On the thirty-second lap, the Italian led by 39 seconds, but Hughes cut this down one second 'ere another circuit had been made. At the end of the thirty-fifth, however, de Palma had increased his lead by 8 seconds. He now had the better of his rival in the yellow Mercer by 46 seconds.

Again Hughes cut this down when after completing thirty-six laps, he was found to be only 39 seconds in the rear. Two laps later, however, when de Palma flashed across the tape winner of the eighth Vanderbilt cup race, Hughes was still at about the same position. The other cars finished in good shape. Wishart being the third to receive the checkered red flag, followed by Anderson and Clark, the latter had tire trouble in his thirty-fifth lap.

De Palma's time for the distance of 299 miles, 2764 feet, was 260 minutes 31.54 second, making an average of 68.9 miles an hour for the entire race. Hughes completed the distance in 261 minutes 14.24 seconds, averaging 68.8 miles per hour.

Wishart's time was 267 minutes 35.75 seconds; Anderson's was 279 minutes 40.95 seconds, while that of Clark was 291 minutes 39.75 seconds.

These speeds are considered good considering that the course has sharp turns and there are several grades.

ROBERTS IN MASON TAKING TURN AT CITY LIMITS

Knox Company in Hands of Receiver

Springfield Concern Forced Into Courts by Lack of Ready Money—Assets Placed at $2,000,000; Liabilities, $1,300,000—Trustee to Operate Factory—Ohio Motor Car Co. Again in Similar Predicament—Ward Buys King Plant

SPRINGFIELD, MASS., Sept. 28—Considerable surprise was created here today when the announcement was made that the Knox Automobile Co., one of the best known concerns in the country, had made an assignment for the benefit of its creditors to Edward O. Sutton and Harry G. Fisk.

It is estimated that the assets of the company as a going concern are about $2,000,000; its liabilities, exclusive of its capital stock, are about $1,300,000. The immediate cause of the assignment was a lack of funds to pay current expenses and it was said that there was hardly enough cash on hand to meet the weekly payroll last week. As a result the directors held a meeting Friday evening and they voted to make an assignment, so the papers were made out in the office of Charles H. Beckwith and filed shortly before noon today.

Unless creditors who have not already assented to the program of the directors in making an assignment take such action as will throw the company into bankruptcy, the trustee will keep the factory in operation for the present. The company has been doing a good business lately and there are many orders on the books for both pleasure cars and trucks, many of them fire wagons.

Mr. Sutton stated that a curtailment of expenses will be necessary to pull the company through the assignment without going into bankruptcy, and this will be made by a lessening of the force and a temporary reduction in output. This will be divided equally between the lines, as the orders have been coming in generally in equal numbers.

The Fisk Rubber Co. is one of the largest creditors of the company, the amount being about $75,000. To the estate of the late Alfred N. Mayo, who a few months ago at his death was treasurer of the company, there is due about $900,000, consisting chiefly of the company's notes. Mr. Mayo was the largest owner of Fisk company stock, and Harry G. Fisk is a son-in-law of Mr. Mayo, as is also Mr. Sutton, secretary and assistant manager of the company, so the matter is somewhat of a family affair. Knox company notes aggregating $70,000, indorsed by Mr. Mayo, are held by banks, of which $30,000 are in Springfield. The remaining $270,000 of liabilities are held by about 300 creditors scattered about the country. Not one of them reaches $5,000 and none of them is pressing, so the company has a good chance to get going again.

There is outstanding nearly $1,000,000 of capital stock, much of which is held in and about Springfield. About half of this is preferred stock, and this stock represents the liabilities of the Knox company with its creditors 5 years ago, when the creditors agreed to take their pay in this stock. Whether the stockholders will get anything back now is a question. If the company should now be liquidated the outstanding debts hardly could be paid.

The $2,000,000 assets are said to include $315,000 for the real estate, $1,200,000 for finished product and stock in process of manufacture and about $200,000 in bills receivable. The Mayo estate is so large that it can withstand the present trouble, as it comprises besides the Fisk Rubber Co., the Merrimac paper mill at Lawrence and large interests in a brick making industry.

Mr. Mayo went into the Knox company originally through being a creditor when the company became involved in 1907 after several years of prosperity. An assignment was then made to Mr. Mayo and he took up the management of the company with energy and ability. He cleared things up and returned the management of the business to the company, of which he became treasurer.

The preferred stock issued in payment of debts at that time reached $494,700 and was cumulative 8 per cent, being preferred not only as to dividends but as to principal in case of liquidation to the $500,000 common stock. The first year following the company did a big business, clearing $160,000, and next year double that amount. Three semi-annual dividends of 4 per cent were paid and things looked bright. But 2 bad years followed and Mr. Mayo had difficulty financing the company and on his death last summer there was much speculation as to the future of the concern.

OHIO IN RECEIVER'S HANDS

Cincinnati, O., Sept. 27.—As the result of the necessity of preparing for a greater business than it had funds to handle, the Ohio Motor Car Co. of Carthage, O., has again fallen into the hands of a receiver. Action was brought against the incorporation by the Diamond Tire Co. of New York, a creditor to the extent of a $6,000 note, which was due September 15 last, and which is still unpaid.

Vice-president A. E. Schafer filed an answer and joined in prayer for a receiver for the company. The judge appointed a member of a local tool works receiver, fixing his bond at $25,000 and ordering that he continue the business, as well as keep the service department going.

It is believed that the embarrassment of the concern will be only temporary, unless the differences between President C. F. Pratt and Vice-president Schafer, who are in active control of the business, with the rest of the stockholders and directors, are settled. The company was reorganized after a receivership a few years ago. A large business was being done, and, in preparation for a larger business than was anticipated the coming season, the company stocked up heavily and now has more than $200,000 worth of materials and partly finished parts on hand.

The corporation is a $250,000 one. Its last financial statement, made September 1, 1912, showed assets worth $404,840.98, and liabilities of but $177,828.18. A delay in receiving some of the material needed caused the canceling of many orders, and much of the income that was depended upon to meet the claims as they fell due, failed to materialize, bringing about financial difficulties, although, it is claimed, the company's assets exceed its liabilities by about $200,000.

"We might say that recognizing for some time past that an increasing business demanded an increased liquid capital, we started out several weeks ago to secure the same, and our negotiations had finally reached a point where had our creditors been willing to hold off for another week or 10 days we should have been able to consummate our negotiations, and with the increased capital which that would have brought, we would have been in excellent financial condition to promptly liquidate all claims against us," says Vice-president Schafer. "As stated, however, some of our creditors insisted on pressing their claims, and therefore it was decided for the best interests of all creditors to go into the hands of a receiver.

"With regard to the differences which have existed between the president and vice-president on one hand and some of the other directors on the other hand, I would say that they have been matters of policy with reference to the conduct of the business, among other things being that the president and vice-president have insisted for a long time that a larger amount of money should be spent for publicity purposes.

"Within 48 hours of the time that the receiver was appointed, we were in receipt of overtures from some interests which are desirous of taking up our proposition and refinancing it thoroughly, and these negotiations are being proceeded with at this time. We are firmly of the opinion

that the receivership will be of only very short duration, and since we have received within the last 4 weeks more inquiries for our line than we had received in 12 months before, we feel confident that our affairs will soon be back in normal condition and that we shall be able to do an excellent business for another year."

WARD BUYS KING PLANT

Detroit, Mich., Oct. 1—Artemus Ward, of the advertising firm of Ward & Gow, New York, has purchased the assets of the defunct King Motor Car Co. for $41,000 and will continue the factory indefinitely. His bid was accepted by the United States district court receiver, the Union Trust Co., of Detroit, last Saturday, and the consummation of the agreement means that the creditors of the company will receive about 12 cents on the dollar.

Mr. Ward is the heaviest creditor of the company, having loaned it $100,000 in cash and also has an unsettled claim for advertising against the concern amounting to about $29,000.

The action of Mr. Ward was due to his desire to protect his investment and the determination to continue the company, at least for the present, means that the 219 cars partially completed and represented by unassembled material and parts will be finished and marketed in the near future.

When the first appeal to the courts was made concerning the affairs of the company, it was found that in order to continue the manufacturing as contemplated by Mr. Ward would require material, parts and money to the extent of $175,000. This did not appeal to the accessory men and the field was left open to Mr. Ward to take the initiative.

While Mr. Ward declined to forecast anything but the immediate future of the company, it is understood that the organization will be kept together for a considerable period.

UNITED MOTORS' AFFAIRS

New York, Oct. 1—While the official situation as regards the affairs of the United States Motor Co. is indecisive, the following tentative plan of reorganization has been published in New York covering the reorganization, by Wall street specialists in the securities of the company.

According to L. P. Cartier, the plan appended was submitted to all the interests involved in the problem of reorganization and was pronounced accurate except as to the details of distribution under the plan of assessment.

Officially, the reorganization plan will not be announced before Thursday afternoon, but it is generally understood that the plan has been arranged and the steps to be taken between Tuesday and Thursday are perfunctory.

The plan suggested to those interested is as follows:

The present company will be sold to a new company which will have a capitalization of about $28,000,000 par value. The new company will have three classes of stock: $10,000,000 first preferred 7 per cent cumulative stock, $8,000,000 second preferred 6 per cent non-cumulative, and $10,000,000 common. There will be no bonds or debentures, and no fixed charges of any kind.

The present obligations of the company amounting to about $12,000,000 will be taken care of as follows: The 6,000,000 outstanding debentures will be exchanged for new stock; $4,000,000 notes held by banks will be exchanged for new stock; merchandise bills amounting to about $2,000,000 will be paid in cash.

Present stockholders will be permitted to exchange their holdings for stock in the new company upon payment of $22.50 a share on their old stock. The proceeds of these subscriptions will amount to approximately $5,500,000. The subscriptions will be underwritten by prominent New York bankers.

As the company now has in the treasury about $1,500,000, the new company will have approximately $5,000,000 working capital after the payment of the $2,000,000 merchandise bills. The new company will, therefore, start out free of debt and without fixed charges, with no obligations and with about $5,000 working capital.

It is estimated that the present assets of the United States Motors Co., which will be owned by the new corporation, have a conservative book value of at least $18,000,000 to an operating company, and are probably worth considerably more in the hands of a new, well-organized concern such as the new company will be. With the $5,000,000 working capital added to these book values the company will have good assets of at least $23,000,000 back of the $28,000,000 total issue of stock. This means that there will be values of two and one-third times the total issue of first preferred stock, one and five-eighths times the second preferred stock and about one-half on the common stock. In other words, there will remain $5,000,000 of assets against $10,000,000 par value of common stock.

It is conceded by all familiar with the present business of the United States Motors Co. that with an adequate working capital the company would have earned in excess of $2,000,000 a year and that $2,000,000 is a conservative estimate of the new company's earnings during the next twelve months. This will leave, after the payment of first and second preferred dividends, about $1,220,000 for depreciation, reserve and dividends on the common stock.

Preferred—Upon payment of $22.50 a share on 100 shares of old preferred stock there will be issued therefor in stock of the new company, approximately: 30 shares of first preferred 7 per cent cumulative stock, twenty shares of second preferred 6 per cent non-cumulative stock, thirty shares of common stock.

Common—On payment of $22.50 a share on 100 shares of old common stock there will be issued therefor in stock of the new company, approximately: Twenty-two and one-half shares of first preferred 7 per cent cumulative stock, twenty or seventeen and one-half shares of second preferred 6 per cent non-cumulative stock, twenty or twenty-five shares of common stock.

Based on the assets that will be in possession of the new company it is estimated that the new stock should have the following values: First preferred, $90 a share; second preferred, $70 a share; common, $10 a share.

At these figures the value of the new stock received in lieu of 100 shares of old preferred would be $4,400, for which a subscription of $2,250 would be paid, leaving a value in excess of the subscription price of $2,150. This gives a present value of $21.50 to the old preferred stock. Figuring the common in the same way, gives a value of around $12 to $14 to the present old common stock.

CHALMERS INCREASES STOCK

Detroit, Mich., Oct. 1—At a meeting of the stockholders of the Chalmers Motor Co. held today, the Detroit corporation voted to increase its capital stock from $3,000,000 to $5,000,000. Of this amount, $1,000,000 was paid in stock dividends to the shareholders, and the other million was placed in the treasury for future use. The regular quarterly cash dividend of 2½ per cent, payable October 1, was also declared at the meeting. This amounts to about $75,000. The closing price of the Chalmers stock on the Detroit exchange on September 28 was 156, and figuring on this basis the new stock issue of 10,000 shares has a value of $1,560,000.

The Chalmers Motor Co. since its incorporation has enjoyed a wonderful growth, having extended its factory in 5 years from a single three-story building to the present plant with seventeen buildings and over 1,000,000 square feet of floor space.

To enable the company to make the factory development made necessary by its big success, the stockholders for a period of 18 months drew no dividends, but so far this year the company has been paying 2½ per cent per quarter and has now declared this additional stock dividend.

C. P. HENDERSON MAKES A CHANGE

Indianapolis, Ind., Sept. 30—Charles P. Henderson has resigned as sales manager of the Cole Motor Car Co., to become president and general manager of the Henderson Motor Car Co., succeeding as president L. Carter, of Jessup, Ga., who has been the nominal head of the Henderson company since its organization some months ago.

Mr. Henderson is a heavy stockholder in the Henderson company, but when that concern was organized agreed to remain with the Cole company for the time being. The Cole sales department is to be in the hands of a number of district sales managers appointed recently.

SALESMEN ATTEND CONVENTION

New York, Oct. 1—One of the largest and most successful meetings in the motor car trade, the sales managers' convention of the manufacturers of the Automobile Board of Trade, finished its work today and adjourned with the recommendation that a similar gathering be held within 3 months. There were thirty-nine present.

The papers discussed were of a kind that will make for a better knowledge of trade conditions and particularly for a broader understanding of the needs of the public, which is now buying 275,000 to 300,000 cars every year.

Papers read and discussed included "Freight and Shipping," by J. S. Marvin, traffic manager National Association of Automobile Manufacturers; "Selling and Advertising," by J. G. Monihan, of the Premier Motor Mfg. Co.; "Motor Car Equipment," by George E. Daniels, of the Oakland Motor Car Co., and C. S. James, of the Willys-Overland Co.; "Territory and Selling Rights," by Alfred Reeves, Maxwell-Briscoe Motor Co.; "Annual Models," by Charles W. Mears, Winton Motor Carriage Co., and S. D. Waldon, Packard Motor Car Co.; "Inclosed and Semi-Inclosed Bodies," by H. O. Smith, Premier Motor Mfg. Co.

LAMP PATENT SUIT STARTED

New York, Oct. 1—Suit has been filed in the United States district court by the DuBois Safety Lamp Co. against the Gray & Davis company for alleged infringement of patent No. 919837, which covers a certain type of set-screws, used inside instead of outside the lamp structure. The matter is returnable on the October rule day and will be answerable 30 days thereafter. The patent, while apparently of minor importance, is said to involve considerable values.

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Let Us Have Touring

THE Glidden tour for this year was postponed a week ago, and now it has been called off altogether for this year because of a scanty entry list. On the face of it, this admission would seem to prove that touring is waning in popularity in America, that the cry "See America First" is more of an imagination than a reality, and that general country-wide interest in long-distance touring is on the wane.

THIS is not the case. There is greater interest today in country touring than there was 10 years ago. Then why the apparent apathy of today? Bad roads is the answer. Had the proposed route from Detroit to New Orleans for this year's tour been over stone roads, over which the private owner could take his family without danger of being benighted in some quagmire; without danger of getting stranded in the middle of some creek to be forded; without danger of skidding into some deep ditch on a mud highway; without danger of getting delayed due to mud, and belated all night on an impossible road; or without danger of putting his new car entirely out of commission, then owners would have entered in large numbers and the tour would have been an unqualified success.

IT is putting the cart before the horse to lead what is supposed to be a pleasure tour over impossible roads, expecting the public to enter, and also expecting that, after the tour has passed through, all of the local sections of country will take up the question of building the roads as they should be built. Put the tour through first and expect the roads to be built afterwards is the wrong policy. It never has accomplished road building and never will. If the national tour is to be a stimulus to road building, then the tour must be given to a certain section of country conditional on the roads, outlined in that section over which the tour is to pass being improved at least 3 months before the scheduled start of the tour, and if such improvement is not made at that time, then the tour should not go over that route. With such a method of procedure there would be assurance that road improvement would actually come as the result of touring.

THE national tour of 2 years ago passed over many sections of the present outlined route from Detroit to New Orleans. Two years ago the touring cars were forced to pick their ways through the trees of forests with real quagmires among the trees, and only long poles stood upright in these quagmires to tell which ones it was impossible to get through. At that time makers' representatives were forced to stand in mud and slime above the knees and literally push cars through these holes. That tour did not result in building of new roads through these sections, and if the present tour did go through these sections and the car occupants had to do the same thing over again it is more than questionable if it would lead to any quicker activity.

IT is ridiculous to ask car makers to send their professional car crews over such so-called highways, and immeasurably more absurd to ask private car owners to pilot their machines, filled with their wives and children, over such highways. The selection of the route is wrong. It is always wrong to put a national private-owners' tour over some of the worst roads to be found in the country. Put the tour over good roads and you will have entries and the country will see that touring is not on the wane.

THERE should be a national tour for 1913. It should be an owners' tour. Not a maker should be allowed to participate directly or indirectly lend his influence or money. The tour should be in the holiday season, when business men who want to lose the office cobwebs have an opportunity to do so. The holiday season is imperative, because then business is slack, law courts are closed, the great commercial life takes its annual sleep, and the business man can free himself without feeling he is neglecting business, as he must feel when he leaves his office in the months of September and October.

THEN, the national tour should be over good roads, through country that combines the scenic with the historic, a country that has good hotels, good garaging facilities, and good bridges.

IT should not be imperative for each entrant to go the entire tour distance, which may be 1,500 miles or 2,000 miles. Divide the tour into sections, say, three of 500 miles each, and compel each entrant to cover under touring rules at least one of these sections. Put up a series of trophies: A grand trophy, preferably the new National trophy, for entrants covering the entire distance; put up a trophy for each of the separate three sections; put up a trophy for cars covering the first two sections, the intermediate two, or the final two sections. In this way it would be possible for an owner living in the territory in which the tour starts to cover the first section and return to his home in the course of a week. The same would be true with owners living in the territory comprising the second and third sections.

IN such a tour give time to visit the historic points of interest and the scenic points. Issue booklets in advance descriptive of the points of historic interest and those of natural attraction. Publish points of commercial and industrial interest on all of the towns and cities passed through. In a word, make the tour worth while, and the car owners will support it.

The Vanderbilt Cup

THE eighth annual Vanderbilt cup race has been run, and while it lacked in point of numbers the entries of preceding classics, those who drove at Milwaukee Wednesday made up in quality what was lacking in numbers. Milwaukee must be complimented for its gameness in running off the meet. Without the backing of manufacturers who have supported other Vanderbilts, the Brewers made the best they could out of what was available; they pluckily postponed the meet when the course was discovered to be unfit, and even with the gloom cast by the death of Bruce-Brown they made good. A crowd of 50,000 on other than a holiday is a most excellent turnout and Milwaukee is to be complimented on its showing. There is no lack of interest in road racing in America among the people, and it is to be hoped Milwaukee will try again in 1913, when an even greater success should crown its efforts.

Bruce-Brown Meets Death at Milwaukee

Fiat Driver Dies Following Accident in Grand Prix Practice

MILWAUKEE, Wis., Oct. 1—David Loney Bruce-Brown, racing driver, died this afternoon at the Trinity hospital here from a basal skull fracture as a result of the ditching of his Fiat car in which he was speeding at the rate of about 82 miles per hour on the Wauwatosa course while in practice for the grand prix which is to be run Saturday. His mechanician, Anthony Schudelare, whose skull also was fractured, lies at the point of death and his recovery is doubtful.

The accident occurred on the back stretch shortly before 1 p. m., when the entrants were at the height of the day's practice. While speeding at the remarkable rate of about 82 miles an hour, one of the rear tires of the big Fiat exploded, causing the car to lurch into the ditch. In a vain attempt to right the machine, Brown jerked the wheel in the other direction, causing the car to jump to the other side of the road. Both driver and mechanician were pitched out and the car, turning completely over, crashed through a fence.

Brown and his mechanician were picked up unconscious by farmers who had witnessed the accident. Word was immediately conveyed to the officials and both men were rushed to the Trinity hospital, where they were operated upon. Brown never regained consciousness.

The accident occurred on the lap following that in which Brown had made the circuit in 5:53.82, unofficially establishing a new world's road record. This was an average speed of 80.2 miles per hour.

The first inkling of the disaster reached the grandstand and officials when Tetzlaff, Bruce-Brown's team mate in another Fiat, drew up before the stand to inquire where Brown was.

David Bruce-Brown was born in New York in 1887 and began racing in 1907. His first appearance was in an Oldsmobile at the Empire City track, where he won his first race. In 1908 he acted as mechanician for the late Cedrino at Ormond beach. Later he created several straightaway beach records. His two most brilliant victories were the grand prize races at Savannah in 1910 and 1911, the latter in the same Fiat which he was driving today. In the French grand prix this year he won the first leg of the 2-day event and finished third, but was disqualified for taking on gasoline outside a regular station, which was against the rules.

THE LATE D. BRUCE-BROWN

ROAD CONGRESS CONVENES

New York, Oct. 2—Special telegram—The 6-day annual convention of the American Road Congress opened at Atlantic City, N. J., Monday and will continue until Saturday, October 5, with three sessions daily. More than 600 delegates from all parts of the United States and Canada have registered to date and many more will arrive before the end of the week.

In addition to the good roads addresses, papers and discussion from the users and from the road builders' viewpoint, there is a big exhibit of the United States office of public roads under the direction of Logan Waller Page and also a large exhibit of road-making machinery under the auspices of the National Association of Road Material and Machinery Manufacturers.

The first 2 days were given over entirely to the motor interests, being known as road users' days and conducted by the American Automobile Association which arranged the programs for the sessions. The remainder of the week is given over to various road building organizations: Wednesday's sessions are under the direction of the American Association for Highway Improvement; Thursday is financial day in road building; Friday is construction and maintenance day, and Saturday is also given over to this department.

Monday's program included addresses on national systems of marking roads, state motor laws, the farmer in road making, working state aid, federal aid, transcontinental highways and business organizations in road building.

Judge J. M. Hough, Kansas City, Mo., had presented for him an address on the National Old Trails Association, which is the transcontinental highway by way of Cumberland pike, Boone's Lick road and Santa Fe trail. He craved recognition for this transcontinental highway because of its historical significance, and also its possibility as an all-the-year-round route.

Mrs. Donald McLean, honorary president-general of the Daughters of the Americal Revolution, spoke on the same subject.

Charles Thaddeus Terry, chairman of the A. A. A. legislative board, claimed "a right of the motorists to be delivered from bearing all the expenses of road building and maintenance."

National Tour Called Off

New York, Oct. 2—Special telegram—The national tour, scheduled to run from Detroit to New Orleans, starting October 14, has been declared off for this season, but will be run over the same course in 1913 at a date to be announced later.

The declaring of the tour off for this year was decided on at a meeting here today of the A. A. A. tour committee, which gave out the following report:

"The national tour committee today postponed the annual reliability run until 1913. Presidential campaign activities are held responsible for the depleted entry list and suspended interest in the long distance tour. Many cities on the Detroit-New Orleans route have guaranteed teams for next year, while many sections of the route which are at present in bad shape, will have been rebuilt by that time."

The feeling is general among motorists that a national tour should be held in the holiday months of July and August, as it is almost impossible for many amateur motorists to get away from business after the middle of September.

RUBBER SHOW CLOSES

New York, Oct. 1—Despite a few jarring notes, the great rubber exposition came to a conclusion in a burst of harmony. The attendance during the 10 days of the show was excellent from the viewpoint of the rubber men, but would have been considered microscopical for a motor car show. It made up in quality what it lacked in quantity, according to those most interested.

The final act at the show was the sale of the crude rubber that formed the exhibits of various countries, amounting to all to about 150 long tons. The sale was not an auction, as the bids were submitted under seal.

The Brazilian state of Amazonas was given the chief award for an exhibit of wild rubber for its 30-ton heap of Madeira and British Malaya was given the principal prizes for plantation rubber shown.

Goodyear Contributes to Road Fund

NEW YORK, Sept. 30—The Goodyear Tire and Rubber Co., Akron, Ohio, has authorized Carl G. Fisher to put it down for a $300,000 subscription on the stone road from New York to San Francisco, the material of which has to be purchased by a $10,000,000 fund subscribed by the motor car manufacturers, dealers, and owners. This is one of the largest single donations to date, and coming unsolicitedly from this concern shows the wide interest already being taken in making road-building a reality by the industry furnishing the money to buy the materials.

To date the folowing manufacturers representing Indiana have contributed, the gross amount exceeding $350,000, on the basis of each company paying ⅛ of 1 per cent of its gross business for three successive seasons: Prest-O-Lite Co., Wheeler & Schebler, Ideal Motor Car Co., Premier Motor Mfg. Co., Waverley Co., Gibson Automobile Co., American Motors Co., Marion Motor Car Co., Henderson Motor Car Co., Empire Tire Co., Remy Magneto Co., Esterline Mfg. Co., Motor Car Mfg. Co., Gus Habich, Gibson Automobile Co., C. Off & Co., Gates Mfg. Co., Pumpelly Battery Co., Brown Commercial Car Co., Glover Equipment Co., G. A. Schnell, R. J. Irvin Mfg. Co., A. M. Westing Co., Cadillac Automobile Co. of Indiana, Archey-Aitkins Co., and the Hoosier Motor Club. These subscriptions amount to $60,000 and downwards. This list includes many dealers, and other concerns engaging in manufacturing tops, batteries, and various other lines of work.

The industry is at present awaiting the action of Detroit as a unit on this road matter. Messrs. Waldon and Chapin, of the Packard and Hudson companies respectively, are enthusiastic over the plan and are working diligently to push it along. Henry Ford has issued a letter to all of his dealers and users with the aim of getting their views on the matter, which may to an extent determine the attitude of this company. Many members in the trade are constantly writing their friends so that the enthusiasm is working rapidly.

A. G. Batchelder of the American Automobile Association, who has been conducting a national campaign for federal aid in road-building, is in acord with the movement and looks upon it as working hand in hand with the general good roads campaign that his association is working on.

President Ancil Martin of the Phoenix, Arizona, board of trade has wired as follows regarding the transcontinental stone r ad, taking the southern route by way of Arizona so as to insure a highway open all the year around:

"National highway ocean to ocean must be open all the year around to be fully appreciated and useful. Only route open

Tire Concern Will Pay Over $300,000 for the National Trail

the year around lies through Salt River valley and Phoenix. This road endorsed by southern California and big sums appropriated to construct same. Many miles already splendid motor boulevard. We rely on your organization to see to it that this route is adopted by nation.—Ancil Martin, president; Harry Welch, secretary, Phoenix Board of Trade."

DISBROW CUTS 50-MILE MARK

Detroit, Mich., Sept. 30—Louis Disbrow, driving a Simplex, set a new mark for 50 miles on a circular dirt track, when he covered that distance at the Michigan state fair grounds here Sunday in 45 minutes and 32 seconds. The previous record of 47 minutes 21.65 seconds, made at Syracuse, N. Y., a year ago at the New York state fair by Ralph de Palma, was cut down nearly 2 minutes. Disbrow's record of Sunday will be allowed, because the meet was sanctioned by the A. A. A. and it was timed with the Warner electric timing instrument.

Several exhibition races also were run off in which Endicott, Kilpatrick, and Ulbrecht participated. A big crowd was in attendance at the races.

BURMAN BREAKS MILE RECORD

St. Louis, Mo., Oct. 1—Bob Burman and his big Blitzen Benz were the feature of the 2 days' race meet which opened at the new St. Louis track Sunday afternoon. Burman lowered the world's record for a mile on a circular dirt track to :47:61.

This is the first time that there has been any motor racing here for some years and the great interest is attested by the number of local cars that were entered in the races.

The new track is not banked and is said by many to be dangerous. Sunday's summaries:

Five miles, non-stock cars, 450 inches piston displacement—Rainey, Ohio 999, won; Ringler, Mercer, second. Time, 2:03.

Five miles, non-stock, 600 inches piston displacement—Burman, Cutting, won; Savin, Ohio 999, second. Time, 4:02.

Remy Brassard and trophy, free-for-all, best two heats in three—Burman won in straight heats. Time, 3:19⅘ and 3:06⅘.

Exhibition mile—Burman, Blitzen Benz, to lower record. Time, :48⅘.

ESTIMATE OF COST OF TRANSCONTINENTAL ROAD CONSTRUCTION

Accurate data already have been gathered on the subject of cost of road construction of the Fisher highway, and the following figures show the actual cost of materials and labor for a stone road, and also a brick road. The cost of concrete bridges is also given.

Stone roadway 12 inches thick and 2 inch screening New York to Mississippi river:

COST OF MATERIAL

Stone	$1.25 f. o. b. siding	
Excavation	.50	cu. yard
Teams	5.00	per day, 10 hours
Labor	2.00	per day, 10 hours

COST PER SQ. YARD CUT 12 INCHES THICK

Stone	$0.43	$2,270.40
Screening	.07	369.60
Hauling	.43	2,270.40
Unloading	.05	264.00
Grading	.17	897.60
Oiling	.05	264.00
Rolling	.10	528.00
	$1.30	$6,864.00

Roadway 9 feet for 1 mile=5,280 sq. yards at $1.30—$6,864 to $7,000.
Roadway 12 feet for 1 mile=7,040 sq. yards at 1.32— 9,334 to 9,500.

Brick roadway 12 inches excavation from New York to Mississippi river:

COST OF MATERIAL

Brick	$18.00	per M f. o. b. siding
Concrete	4.50	per yard
Excavation	.50	per yard
Sand	1.00	per yard
Teams	5.00	per day, 10 hours
Labor	2.00	per day, 10 hours

COST PER SQ. YARD CUT 12 INCHES THICK

Brick	$0.75	$ 3,960.00
Hauling	.16	844.80
Grading	.16	844.80
Grouting	.12	633.60
Foundation	.50	2,640.00
Rolling	.05	264.00
Cushion	.08	316.80
Margin curb	.40	2,112.00
	$2.20	$11,616.00

Roadway 9 feet for 1 mile=5,280 sq. yards at $2.20—$11,616 to $12,000.
Roadway 12 feet for 1 mile— 7,040 sq. yards at 2.13= 15,000.

Concrete bridges	Cost if roadway is 9'	Cost if roadway is 12'
6' span	$ 150.00	$ 200.00
12' span	350.00	450.00
14' span	400.00	500.00
18' span	700.00	950.00
24' span	950.00	1,300.00
36' span	1,450.00	1,950.00

COST PER SQ. YARD CUT 12 INCHES THICK

Stone at $1 per cu. yard

Stone at	$0.34	$1,795.20
Screenings at	.06	316.80
Hauling at	.43	2,270.40
Unloading at	.05	264.00
Grading at	.17	897.60
Oiling at	.05	264.00
Rolling at	.10	528.00
		$6,336.00

Hoosiers to Cross Continent Next Year

Exhibition mile—Burman, 300-horsepower Benz, to lower world's record. Time, :47.61.

Five miles, free-for-all handicap—Burman, 20 seconds handicap, won; Savin, Ohio 999, second. Time, 4:55.

St. Louis, Mo., Sept. 30—Records for a mile and for 2 miles on a circular dirt track went by the boards Monday afternoon when Bob Burman thundered around the Maxwellton track at the new St. Louis fair grounds, doing the mile in 46 seconds flat and the 2 miles in 1:32⅘.

Ollie Savin, driving a Cutting, went through the fence on the first lap of a 5-mile free-for-all event which was to wind up the day's program. He suffered two broken ribs, but is not injured otherwise. The meet was called off after the accident. Summary:

Five miles, non-stock, 450 inches piston displacement—Raimey, Ohio 999, won; Ringler, Mercer, second; Ready, Apperson, third. Time, 5:11.

Three miles, Remy brassard, free-for-all—Burman won in straight heats. Time, 2:54⅘ and 2:59.

Five miles, non-stock, 600 inches piston displacement—Burman, Ohio 999, won; Raimey, Ohio 99, second. Time, 4:39⅘.

Exhibition mile and 2 miles—Burman in 300-horsepower Benz. Time, :46⅘ and 1:32⅘. Last mile in :46.

Ten miles, W. B. trophy, 600 inches piston displacement—Raimey, Ohio 999, won; Burman, Ohio 999, second; Savin, Cutting, third. Time, 10:41.

BOTH CUPS GO TO MAXWELL

Buffalo, N. Y., Oct. 1—The Maxwell car, No. 25, was awarded the Laurens Enos trophy or sweepstakes prize for going through the entire 4 days of the recent 800-mile reliability tour of the Automobile Club of Buffalo without being penalized. The decision, which was rendered last evening by Arthur W. Kreinheder, who was referee of the run, also returns for winner of the Vars trophy, Maxwell No. 7, which completed the run with only 4 points against it, these being imposed for adjusting a magneto wire on the first day of the tour.

Albert W. Poppenberg's car, the Warren-Detroit, which was supposed to have gone clean in the tour, was found to have done 20 minutes' work on tires on the second day's run, the work being done while the motor of the machine was not in operation, which violated a rule of the contest. The performing of this work on the Warren-Detroit car was the ground on which Charles F. Monroe, of the Monroe Motor Car Co., based his protest for the Laurens Enos trophy. However, Referee Kreinheder investigated thoroughly the entire matter and learning that the work had been done on the tires, penalized the car 20 points, thus placing it down sixth on the list of eight cars, which finished the run. The winner of the special trophy for class 2-E touring car was announced as the Hupmobile, No. 8, which finished the tour with penalization of 6 points. It took some little time to arrive at this decision, but the matter was referred to the A. A. A. contest board for review.

Indiana Manufacturers' Tour for 1913 May Go to San Francisco

INDIANAPOLIS, Ind., Oct. 1—At a meeting of the Indiana Automobile Manufacturers' Association at the Claypool hotel in this city last night, it was proposed that the 1913 tour of the organization be over one of the proposed routes of the Fisher-Allison stone roadway to the Pacific coast. The proposition was referred to the runs and tours committee, with instructions to report back within 30 days. This run would take the place of the four states tour and would be for Indiana manufacturers exclusively.

The suggestion came from W. McK. White of the Marion Motor Car Co., who thought it would be a good plan to make a pathfinding tour over the proposed new highway and mark the route so tourists might follow the trail to San Francisco in 1915 for the Panama-Pacific exposition.

It was estimated the tour would require from 16 to 20 days actual running in each direction and the tentative trail is what is known as the central route and lies through St. Louis, Kansas City, Omaha, Denver, Salt Lake City, Ogden, Sacramento and San Francisco.

Carl G. Fisher was present and in a short talk advocated the tour suggested, and offered his aid in making it a success.

Another proposition taken up at the meeting was that of running a special train for the exhibits of Indiana manufacturers who are to show at the New York motor show in January. It was proposed that the Indiana exhibits could be taken on a special train and that stops be made at Philadelphia, Pittsburgh and other important points en route.

The constitution and by-laws were amended to provide for nine directors and that the annual meeting should be held in September. The following directors, who will elect officers next week, were chosen: C. B. Warren, Haynes Automobile Co., Kokomo; D. S. Menasco, American Motors Co., Indianapolis; E. Mack Morris, Great Western Automobile Co., Peru; W. B. Harding, G & J Tire Co., Indianapolis; George A. Weidley, Premier Motor Mfg. Co., Indianapolis; Guy Simmons, Motor Car Mfg. Co., Indianapolis; Frank E. Smith, Maxwell-Briscoe Motor Co., Newcastle; H. H. McFarlan, McFarlan Motor Car Co., Connersville; R. P. Henderson, Henderson Motor Car Co., Indianapolis.

HOOSIERS PREPARE FOR CONVENTION

Indianapolis, Ind., Sept. 30—Indianapolis swings open its doors to the retail motor car merchant and his salesmen on October 8 and 9. During those 2 days the guests of the Indianapolis motor car manufacturers and those motor car manufacturers from other cities who are coming here to help their dealers and salesmen will be given an opportunity to get the inside on intensified salesmanship and advertising.

The convention will be held in the auditorium of the Claypool hotel. The plans call for business throughout, but arrangements will be made for those who desire morning diversion to visit the speedway and other places of interest in the city. Business sessions are scheduled for both October 8 and 9 with a speedway dinner on the evening of the 8th. On the speakers' program are:

John G. Jones, of the Alexander Hamilton Institute, New York, "Headwork in Salesmanship."

T. J. Zimmerman, Opportunity magazine, Chicago, "The Opportunity of the Motor Car Dealer."

J. J. Cole, president Cole Motor Car Co., "Why I Thought of a National Salesmanship and Advertising Convention."

H. O. Smith, Premier Motor Car Co., welcoming address on behalf of Indianapolis manufacturers.

Advertising Director Leroy Pelletier, Flanders Interests, Detroit, "The Co-ordination of Advertising and Sales."

John Lee Mahin, Mahin Adverstising Co., Chicago, "How to Use Advertising in the Retail Game."

Elbert Hubbard, East Aurora, New York, "Ideal Salesmanship."

B. F. Lawrence, Indianapolis Star, "How to Get the Coöperation of Your Local Newspapers."

Ex-Mayor Charles A. Bookwalter, "Business Methods and the Motor Car."

John Wetmore, New York Evening Mail, "How to Spend Your Advertising Appropriation."

HOOSIERS VISIT GEORGE ADE

Indianapolis, Ind., Oct. 1—About fifty members of the Hoosier Motor Club of Indianapolis, with their friends, made a run from Indianapolis to Kentland and return, Saturday and Sunday. One of the interesting features of the trip was a visit to the home of George Ade, the humorist, who threw open his home to the visitors, entertaining them in an elaborate manner. Weather for the trip was ideal and the round trip was made without special incident. Mr. Ade also will entertain contestants in the Chicago Automobile Club-Chicago Athletic Association team match which will be held October 12.

S. A. E. DISCUSSES TIRES

New York, Oct. 1—The first meeting of the metropolitan section of the Society of Automobile Engineers was held September 26 at the United States Rubber building. The topic of the evening was substitutes for pneumatic tires. An interesting session was held, the greater part being devoted to a paper by Ethelbert Favary, who has invented a very novel and ingenious form of non-pneumatic tire. After Mr. Favary had answered with dispatch the various questions put to him, O. A. Parker dwelt upon the virtues of Newmastic, a tire filler, and Mr. Phelps, of the Zilio company, also talked of a successful filler.

CHICAGO PATHFINDERS IN SAND APPROACHING ST. IGNACE

ROAD THROUGH WOODS IN NORTHERN MICHIGAN

Trail Blazed Around Lake

Chicago Motor Club Pathfinder Finds it Will Take 7 Days to Travel 1,107 Miles Around Big Inland Sea—Itinerary of Strenuous Reliability Run This Month

CHICAGO, Sept. 30—After a sensational trip around Lake Michigan, blazing the trail for the Chicago Motor Club's sixth annual reliability, the Velie pathfinder, which carried John G. De Long, Ronald Clark and John Brolley, reached Chicago last Thursday night. The car was out 13 days in all, but traveled only 7 days in all. The pathfinders had a rough and ready time of it, but returned full of enthusiasm over the possibilities of such a route. They say that while grade 3 rules will prevail, yet the conditions will be strenuous enough to make the reliability fully as stiff a proposition as any of its predecessors. Through the woods of northern Michigan it is practically wild. Yet it can be negotiated, although there will be 2 days when the mileage will not be great.

The total distance to be traveled is 1,107 miles, an average of 158 miles a day. Four states—Illinois, Wisconsin, Michigan and Indiana—will be traversed. The run from Newberry, Mich., to St. Ignace, where the cars will be ferried across the straits, only is 65.2 miles in length. It is made purposely short because of the road conditions. The trail winds through deep forests and through sandy patches, which will furnish plenty of adventure. The problem of crossing the straits is a serious ones, because at this time of the year there is only one boat running. It is expected it will take all night to get the cars from St. Ignace to Mackinaw City. Once on the other side, though, it will be a comparatively easy run the rest of the way to Chicago. The whole trip will be a test of driving ability and should stand out as unique in the annals of western reliability runs.

Entered already for the trip are two Velies, two Stutzes, a Chalmers six, Falcar, two Stavers, and a Detroiter. Two Cadillacs from the Northwestern Military and Naval Academy of Lake Geneva, Wis., are promised, while it looks now as if at least twenty or twenty-five cars will start in the affair. The itinerary of the tour is as follows:

Monday, October 21—Chicago, Waukegan, Kenosha, Racine, Milwaukee, noon control, 88.8 miles; Menominee Falls, Meeker, Schleisingerville, Addison, Theresa, Lomira, Byron, Fond du Lac, Oshkosh; total mileage for day, 170.2 miles.

Tuesday, October 22—Neenah, Menasha, Appleton, Wrightown, Green Bay, Big Swamico, Oconto, noon control, 89.5 miles; Peshtigo, Marinette, Menominee, Escanaba; total mileage for day, 177.6 miles.

Wednesday, October 23—Gladstone, Rapid River, Manistique, noon control 65.1 miles; Pleeny, Germfask, Newberry; total mileage for day, 125.1 miles.

Thursday, October 24—Newberry to St. Ignace; no noon control and no stop for lunch; total mileage for day, 65.2 miles. Cars will be ferried across the straits that night, ready for the start from Mackinaw City the next morning.

Friday, October 25—Mackinaw City to Pellston, Brutus, Oden, Petoskey, noon control, 38.3 miles; Charlevoix, Elks Rapids, Traverse City; total mileage for day, 109 miles.

Saturday, October 26—Copenish, Manistee, Ludington, noon control, 90.3 miles; Kentwater, Hart, New Era, Montague, White Hall, Muskegon, Grand Rapids; total mileage for day, 207.2 miles.

Sunday, October 27—Kalamazoo, Paw Paw, Decatur, Dowagiac, Niles, South Bend, noon control, 118.1 miles; Chesterton, Michigan City, Chicago; total mileage for day, 217.8 miles.

NEW FLORIDA MOUNTAIN ROAD

Boston, Mass., Oct. 1—The Massachusetts highway commission has been visiting the different sections of the state the past 2 months getting in touch with the city and town officials in various places and learning their ideas as to the development of additional roads. As the commission will begin next year the expenditure of $1,000,000 yearly for 5 years on roads, not counting the money from the motorists that will reach close to $500,000, the members of the commission decided to sound out the people and learn what they wanted done.

One of the new roads decided upon by the commission and upon which work has already started is to go over Florida mountain in the western part of the state. There was considerable agitation for and against this road, and after the commission made the decision a number of people appealed to Governor Foss to have the route changed, but he refused to interfere. This new road will remove the one barrier to the northerly touring route in the Bay state. It will be 14 miles in length length and the highest grade will be but and the highest grade will be 7 per cent. The cost will be more than $150,000, requiring a special appropriation.

TYPICAL SETTLEMENT FOUND BY CHICAGO PATHFINDERS

CHICAGO SCOUTS NEARING STRAITS OF MACKINAW

To Lay Denver-Salt Lake Route

Pathfinding Party in White Six to Start Next Monday to Open Up Highway That Will Be Link in Transcontinental Trail—Chamber of Commerce Back of Proposition

DENVER, COLO., Sept. 30—In order to open up a direct route from Denver to Salt Lake as a link in one of the transcontinental highways, a pathfinding car will leave Denver for the trip over the great divide on October 7. The Denver chamber of commerce has proposed the trip and has laid out on paper a tentative route which is believed to be entirely feasible for motor cars. The route is to be logged by John P. Dods, of the Automobile Blue Book. The pathfinding party will be carried in a White big six touring car and includes C. M. Kittredge, Jr., assistant secretary of the Denver chamber of commerce; James A. Harris, advertising manager of the White company; John P. Dods, western manager Automobile Blue Book Publishing Co.; N. Lazarnick, a New York photographer, and the driver. Both the car and the driver are supplied by the White company.

The proposed route takes in Buena Vista, Leadville, Glenwood Springs, Grand Junction, Price and Provo, passing through some of the most scenic portions of the Rocky mountains. When completed the route is expected to be one of the most important for transcontinental travel, as it links at Denver with both the Platte valley route and the Omaha-Denver route from Omaha, as well as the Golden Belt route running from Kansas City. A connection can be made with the Santa Fe trail, as it connects directly with the Rainbow route at Buena Vista between the latter city and Pueblo. The Denver enthusiasts claim that more wonderful scenery is offered through this route than can be witnessed either by going through Wyoming or south through New Mexico. From Buena Vista to Leadville the route leads over wonderful mountain roads, which with wet weather exceptions as a rule are as fine as any boulevards found in the eastern cities. These roads are composed mostly of crushed rock and are not very susceptible to weather. The grades have been reduced so that they can be negotiated by any car.

Leadville is one of the old mining towns of Colorado and holds interest for tourists because of the famous mines located there. Tennessee pass, though one of the highest passes in the rockies, is in excellent condition and is worth a long trip simply to go over the range at this point. Glenwood Springs is a far-famed summer resort and thousands of tourists visit there yearly from the east. Heretofore most of them have come by train, but with the opening of a good motor route it is believed that many will make the trip by motor car. Grand Junction is in the heart of the wonderful fruit district of Colorado and as such has its own attraction.

Entering Utah, the route skirts the Castle valley coal fields, following the D. and R. G. tracks up to Price and from there to Provo and Salt Lake City.

WILBY IN SASKATCHEWAN

Regina, Sask., Oct. 1—Thomas W. Wilby, who is making a transcontinental trip from Halifax, N. S., to Vancouver, B. C., for the Canadian Good Roads Association, reached here on Sunday in a 35-horsepower Reo. He declares he found miserable roads from Toronto to this city, especially so in Winnipeg, which he states is cut off from the eastern section by poor highways. From Toronto, Mr. Wilby came to this city by way of North Bay, Sudbury and Sault Ste. Marie, and by boat to Fort William. From there the route was made to Winnipeg and then across the prairies to Brandon and Regina. Concerning Winnipeg the motorist stated that from Sault Ste. Marie to that city it was almost impossible to traverse the roads. He added that a firm road from Port Arthur to that city would be the end of all such trouble and would certainly serve the western country with inducement to settlers.

Illinois Demands Improved Highways

GROUP PHOTOGRAPHS OF BANKERS, FARMERS, BUSINESS MEN, MOTORISTS AND OTHERS WHO ATTENDED

Meeting at Peoria Discusses Roads and Passes Many Resolutions

PEORIA, Ill., Sept. 27—Immediate and radical steps toward a comprehensive system of improved highways are almost certain to result from the action taken today by the Illinois Highway Improvement Association in which all parts of the state were represented in convention. A fixed policy was outlined and adopted looking to a general method of procedure for the future and special action to be taken in the next meeting of the legislature.

Platform Adopted

The association in a platform which was unanimously adopted went on record as in favor of and recommending a state highway commission to devote its entire time to road construction and maintenance throughout the state, improvement by state aid of main thoroughfares through the country by the commission to be turned over to the state for perpetual maintenance; employment of prisoners in road building on an honor system similar to that employed in Colorado; a compulsory dragging of all dirt roads and the payment of all road taxes in cash with the use of the state motor car tax, together with any other funds appropriated in the improvement of highways; federal aid in the construction and maintenance of postroads and trans-continental highways; an annual good roads day to be designated by the governor; and federal aid in building interstate roads.

The report of the committee on policy sets forth that Illinois, foremost among the states in American resources, finds its general welfare retarded by a system of wretched public highways constructed, maintained and administered under a method in vogue centuries ago, which is not adapted to the problems presented by modern traffic and out of harmony with the advancement of the state in other directions. A great network of 95,000 miles of country wagon roads is left to the haphazard work of 4,800 commissioners working independently of each other, poorly paid, largely inexperienced, and provided with inadequate funds.

Careful investigation has shown that of the $7,000,000 expended annually on the wagon roads of the state, approximately 37½ per cent is wasted, and in some townships a much greater percentage is spent without permanent benefit. Highway improvement is no longer purely a local matter but one in which the citizens are interested to such an extent that the state should assist in solving the problem which the bad roads present to the people.

Many Delegates Present

About 250 delegates from all parts of the state were present at the convention, representing all the varied interests of the commonwealth. All of the associations of business men, laboring men, motoring organizations, bankers associations, chambers of commerce and the agricultural granges were represented by delegations. Several of the larger cities sent delegations of good roads boosters.

The discussion of the platform after it was presented by President William G. Edens included some of the most prominent politicians, bankers, labor men and manufacturers in Illinois. Their words carry weight and the fact that all of them have expressed interest and enthusiasm in the good roads movement indicates that the chances of getting the matter before the legislature and obtaining proper action in the very near future are bright.

Among Those Who Spoke

Among those who discussed the report of the policy committee are A. P. Grout, president Illinois Farmers' Institute; Oliver Wilson, master National Grange; Edwin R. Wright president Illinois Federation of Labor; Charles J. Piez, president Illinois Manufacturers' Association; D. Ward King, inventor of the King road drag; J. D. Phillips, president Illinois Bankers' association; W. E. Wood, attorney Highway Commissioners' Association; A. G. Batchelder, of the American Automobile Association; Mrs. H. M. Dunlap, president home science department, Illinois Farmers' institute; Eugene Kimbark, president Chicago Association of Commerce; Homer J. Tice, member state legislature; John D. Shoop, president Illinois

State Road Commission Recommended

MEETING OF ILLINOIS HIGHWAY IMPROVEMENT ASSOCIATION HELD AT PEORIA LAST WEEK

Platform Also Suggests Employment of Convict Labor on Highways

State Teachers' association; S. E. Bradt, chairman good roads committee of Illinois Bankers' Association; Thomas J. Tynan, warden Colorado state penitentiary; Jesse Taylor, editor Better Roads.

Mr. Taylor expressed himself as being strongly in favor of federal aid in main line construction but stated that it was necessary to convert the members of congress to this idea by making them feel the pressure of their constituents' desires. He stated that where $4,000,000 was spent for target practice each year in the navy only $50,000 was expended for highway improvement. He then compared this with the $170,000,000 it required to maintain a standing army in the Philippines and suggested that the army would be much more useful if brought back and put to work on the roads. He stated that this country was wasting $300,000,000 a year in the cost of getting produce to market because of bad roads and made the statement that with good roads, produce could be gotten to market at an average cost of 10 cents per ton mile.

Competing With Mail-Order Houses

The point also was made that the cheapest and best way for the country merchant to compete with the great mail order houses was to improve the highways from his store, that the trading radius of a town was co-extensive with the good roads from the town during at least 5 months in the year, that the shortness of money and stagnation of trade was due more to bad roads than to any other cause, that they were responsible for 15 per cent of all money going out of the country through mail order houses. He held that all road construction and supervision of roads should be under an efficient county superintendent who, in turn, was responsible to a state engineer, with an advisory board consisting of the three best business men in the state.

Would Also Drag Macadam

D. Ward King, the inventor of the split log drag, favored the dragging of not only dirt roads but said there should be compulsory dragging of macadam, gravel and clay roads as well. He suggested a law such as that in force in Iowa in which the man responsible for a strip of road was fined $50 if the road was not dragged when necessary, and stated that the cost for such dragging averaged only $3.25 a mile a year in Iowa.

B. F. Harris, president of the Bankers' association, announced that the 4,800 road commissioners in the state at present had 4,800 different ways of wasting the taxpayers' money, that the old laws of the state must be thrown out and new one looking to a state-wide supervision be enacted.

The attitude of the labor unions of the state toward the question of convict labor in road work as expressed by Edwin R. Wright, president of the Illinois Federation of Labor was surprising to many of the delegates present. He stated that it was the belief of the labor unions that the employment of convicts on the road was one of the best if not the only means of getting rid of prison competition against organized free labor. He stated that it was the opinion of the labor organizations that the 100,000 able-bodied prisoners in the state could be put on the roads where they would be taken out of competition in cigar making and the manufacturing of shoes, shirts and brooms. Federated labor asks to have the convicts put to work on the road and wants to see them put on the honor system, instead of by the ball and chain as is practiced in some states. A step has been taken in this direction in Illinois in the use of convicts in the stone crushers for road material at Joliet and Chester.

Bankers Make Report

The representative of the Illinois Bankers' association stated that from a series of letters sent throughout the state it was found that the attitude of the farmers had materially changed in the past few years, and that their conversion to the good roads movement was chiefly due to the widespread use of the motor car among them.

The meeting was declared to have been a great success.

Cheap American Car Scares British

C. W. Steiger, Chicago Carbureter Manufacturer, Just Back From Europe, Discusses Trade Footing Gained by Yankees—Washington Officials Do Not Anticipate Protective Tariff—July Exports Show Large Increase Over Last Year

THE AMERICAN DANGER.

THE following article, from the Berliner Zeitung am Mittag, reflects in an interesting manner Germany's attitude towards American motor car manufacturers:

"A number of articles have appeared in the press lately calling attention to the 'American peril' that menaces our motor industry. The opinions expressed are widely divergent and while it is pointed out that Americans, in spite of their production in large quantities at a resultant low cost, can never seriously menace our home industry on account of the opinion prevailing that low prices indicate an inferior quality, it is conceded, however, from other sources that this low price will go a long way towards launching American cars on the market.

"As a matter of fact, the Americans have established themselves in practically all the South American countries and, in the last few years, have almost entirely supplanted European manufacturers. Recently they have turned their attention to England and are gaining ground in that country with surprising rapidity. The principle of the American manufacturer is to make his price as low as possible by manufacturing in large quantities, in some cases 40,000 to 60,000 cars a year, and by delivering the car complete and ready for the road; indeed, a complete car may be purchased for 4,000 to 4,500 marks ($1,000 to $1,125). These low prices have made the motor car very popular in America and have stimulated an increased demand. Taking into consideration the different economic value of money here and in the United States, it will be seen that these prices are really lower in America than they seem to us.

"This production in large quantities, with its accompanying lowering of the price, naturally results in a wider market, which in turn increases the demand, which again reacts upon the output. This high output makes possible a reduction in the cost of production, at a still lower price. So we have a steady cycle, tending to lower prices, which, however, will find its limit in the cost of raw material and labor.

"Another factor is that Americans specialize on two types—20 and 30 horsepower—so that the cost of the constituent parts is thus further reduced. The short space of time required for delivery is also of great importance. In America, in a great majority of cases, the owner drives his own car and has no chauffeur, so it is easy to understand that many now have cars who a few years ago regarded them as a great luxury.

"Owing to their low price, it is often deduced that American cars are constructed from poor materials and can therefore furnish but a limited service. This, however, is not the case; indeed, the bad condition of American roads soon showed the manufacturer that only by using the best materials could he compete with his rivals in trade.

"The Americans' constantly varying needs and their severe use of all machinery mean that a car is not expected to have as long a life as in this country. In America, when a man has used a car three years, he sells it and buys another.

"It cannot be gainsaid that Americans, in their ceaseless search for new markets for their tremendous output will seriously menace our industries. This is already shown by the fact that several selling agents in German has used a car 3 years, he this coming year."

The German Idea of It

EXTENT OF THE DANGER

Figures just completed by the division of statistics of the bureau of foreign and domestic commerce show that the exports of motor cars to foreign countries in the fiscal year 1912 were valued at $21,500,000, and of parts thereof, including tires, at $6,750,000. If to these are added the shipments to Hawaii and Porto Rico, we get for the year sales of American cars outside of continental United States of fully $30,000,000, as against only $1,000,000 worth a decade ago. The total number of machines exported to foreign countries was 21,757, valued at $21,550,139, averaging slightly less than $1,000 each, while those to the non-contiguous territory were higher, averaging $1,600 each. The export price of American cars in 1912 averaged less than in any earlier year in the history of the export trade. The average for 1912, dividing the total number of machines exported into stated value, was $990 each, against $1,100 in 1911, $1,380 in 1910, $1,700 in 1909, and $1,880 in 1908. On the import side the cars imported last year amounted to but about $2,000,000 in value, against more than $4,000,000 in 1907. The export price of American machines has fallen from $1,880 in 1908 to $990 in 1912, while the import price of foreign cars entering the country has only fallen from $2,392 in 1908 to $2,216 in 1912, the reduction in price on the export side being 47 per cent. and on the import side but 8 per cent. English-speaking people are the chief purchasers of American cars. Of the 21,757 exported in 1912, 6,288 went to Canada, 5,716 to the United Kingdom and 3,625 to Australia and New Zealand; the next largest number, 1,611, being credited to South America, while European countries other than the United Kingdom took 2,296. Of the 963 cars imported into the country in the fiscal year 1912, 401 were from France, 188 from the United Kingdom, 131 from Italy, 116 from Germany and 127 from all other countries.

CHICAGO, Sept. 30—The cheap American motor car has the English manufacturer guessing, according to C. W. Steiger, of the Stromberg Motor Devices Co., Chicago, who has recently returned from a European trip. From the first of April to July one American manufacturer has sold 1,185 cars in England by accurate count. Several other American manufacturers' figures on sales also are large. The Englishman cannot understand how the American maker can retail a motor car in England at a price below that asked for the cheapest English made car and at the same time pay a high duty on his American product.

Yet this is the condition which the English motor car maker is facing today. The cheap American car, Mr. Steiger says, is built for American road conditions and when operated on the splendid European highways its durability is even greater than it is on its home ground. We, over here, build our motor cars very heavy, and they stand up on our poor roads equally as long as the European car holds out on the boulevard roads of England and the continent.

There is not as much demand for the higher priced American motor car because of the prejudice which every Englishman holds against American goods. He can buy an English-made car as cheaply as he can the medium-priced American car, and he prefers the former perhaps as much as for any other reason because all American products are regarded as cheap.

In the manufacture of carbureters and in their development the English are 5 years behind, Mr. Steiger believes. No improvements of any appreciable nature have been made within that time. The tendency, on the other side, is to come back to the use of the high-speed motor and to the use of non-adjustable carbureters. For this reason the several makes which require but little attention in handling predominate in sales. While the English motor car user clamors for gasoline economy or low fuel consumption he uses gasoline which is of two grades, Pratt or Schell. These have a gravity of from 72 to 76

degrees. No fuel having as low a gravity as 68 degrees is used in any quantity because of the poor results in economy. The American carbureter has kept abreast of the times and has been developed to use the lower gravity gasoline most economically and with best results. This the undeveloped English carbureters cannot do. In general, it may be said that the popularity of the mechanical movement carbureter is on the wane abroad.

The Englishman is fussy also about the body of his car. He cares little for the mechanical construction so long as the interior and the general appearance of the machine is luxurious. Mr. Steiger interviewed a number of American dealers in London and from information gained from them he states that the greatest trouble which they experience in marketing their goods is because the American cars are furnished with stock bodies. The English taste favors the low, rakish type of construction and your Englishman will have no other. The American manufacturer who is making a success in England furnishes his car to his English agent without the body. In most cases the customer prefers to have the body built individually for the American chassis, that is, if he has come to realize the advantage of the stronger construction and generally sturdier build of the American machine.

As in this country, the time has passed when the American maker can sell his product abroad and make it stay sold, unless it carries service along with it. All the enterprising American firms which have entered the European field have sales branches in connection with service stations where the cars or other apparatus which they sell may be kept in good condition. The service factor is as big a one in England as it is here, and the Englishman asks just as much along this line as does the American.

As to magnetos, Mr. Steiger states that no progress to speak of has been made in England within a number of years. The same may be said for electric lighting. Very few of the cars carry any type of lights save oil lamps. This applies to even the higher priced machines. The self-starter is also laughed at all over Europe. The people on the other side do not believe it is of any value and they look upon it as more or less of a joke. Mr. Steiger cites one case in particular where a chauffeur who was operating an American car equipped with an electric starting system had let the latter get out of order and for some 4 months had made no attempt to have it put into operating condition again.

On the whole, the motor car industry in England is as good as anywhere else, according to Mr. Steiger. Manufacturing methods and the conditions under which the workmen produce even the finest of machines are deplorable, however. The American well-lighted factory is unknown except in one or two cases. Most of the factories are poorly lighted, the buildings are old, and to the American the wonder is that such good products can be turned out under such extremely bad conditions, as compared with those in our own country.

HOW WASHINGTON VIEWS IT

Washington, D. C., Sept. 29—The movement for a protective tariff against foreign goods, especially American, begun by the motor car manufacturers of England, is not regarded as serious by officials of the state department. One of these officials, who does not want to be quoted, ventured the opinion that the movement might have been started by persons who wished to work up popular opinion in England to help float the stock of a big merger of motor car manufacturers there. Another official declared emphatically that, in his opinion, the whole thing was merely a part of the political propaganda of the unionist party.

Reports which have been coming from London during the last few days indicating that it was only against the products of American factories that the movement was directed were received in Washington with amusement. An official of the bureau of trade relations remarked today that perhaps the men who are behind the movement in Great Britain had forgotten that the United States has a maximum and minimum tariff.

It is the official opinion here that the president would have no discretion in the matter if Great Britain should, by any tariff enactment, discriminate against American-made goods of any kind, but he would have to issue a proclamation at once imposing the maximum tariff against British goods imported into this country.

July Exports Show a Large Increase

WASHINGTON, D. C., Sept. 29—The latest returns of the federal bureau of statistics show that during July 1,635 motor cars, valued at $1,702,637, were exported to foreign countries. Of this number 78 were commercial cars, the value of which was $156,458, while the remainder, 1,557, were pleasure cars, the value of which was $1,546,179. During the same month of last year the total number of cars exported was 1,025, valued at $1,104,807. The type of vehicles exported is not given in the official figures for July, 1911, the bureau having just commenced the classification of the kind of cars exported. During the 7 months ended July, 1911, the total number of cars shipped abroad was 8,935, valued at $9,194,564, while during the corresponding period of 1912 the number of cars exported was 15,495, valued at $15,418,172.

The shipments by countries, numbers and value during the periods under consideration were as follows:

	JULY			
	1911		1912	
	No.	Value.	No.	Value.
France	33	$ 45,544	36	$ 81,843
Germany	16	14,357	22	21,188
Italy	32	20,508	36	26,795
United Kingdom	229	219,153	345	230,924
Other Europe	60	70,522	147	124,672
Canada	289	365,989	462	686,889
Mexico	7	18,285	9	14,683
West Indies and Bermuda	21	21,454	13	12,166
South America	48	69,105	180	198,798
British Oceania	168	156,951	309	184,034
Asia and other Oceania	91	75,106	133	124,086
Other countries	31	27,833	43	46,559

	SEVEN MONTHS ENDING JULY			
	1911		1912	
	No.	Value.	No.	Value.
France	273	$ 326,800	430	$ 833,063
Germany	73	91,283	252	199,726
Italy	137	169,914	176	169,252
United Kingdom	1,875	1,653,995	3,676	2,739,948
Other Europe	508	492,222	1,023	859,446
Canada	3,724	3,925,265	5,197	6,253,889
Mexico	147	258,064	125	183,020
West Indies and Bermuda	175	210,432	196	208,303
South America	444	604,229	1,071	1,288,513
British Oceania	938	858,196	2,128	1,948,505
Asia and other Oceania	477	428,119	843	878,678
Other countries	164	176,045	378	355,799

The shipments of parts, not including engines and tires, increased from $255,282 in July, 1911, to $394,296 in July last, and from $1,901,707 during the 7 months of 1911 to $2,893,753 during the same period of this year.

The imports of cars decreased in number from 80, valued at $175,741, in July, 1911, to 64, valued at $155,251, in July last, and from 492, valued at $1,067,091, during the 7 months' period of 1911, to 467, valued at $1,082,301, during the same period of this year. The detailed imports were as follows:

	JULY			
	1911		1912	
	No.	Value.	No.	Value.
France	22	$ 56,142	36	$ 95,438
Germany	14	33,080	6	18,063
Italy	10	14,578	6	11,111
United Kingdom	10	21,469	5	8,810
Other countries	24	50,472	11	21,834

	SEVEN MONTHS ENDING JULY			
	1911		1912	
	No.	Value.	No.	Value.
France	178	$383,959	252	$617,242
Germany	88	193,092	36	87,149
Italy	50	82,610	46	74,965
United Kingdom	78	190,740	88	209,186
Other countries	98	216,690	45	93,759

Foreigners Discuss Horsepower Ratings

English Favor Retention of Present Standard—French After New System

LONDON, Sept. 20—The committee appointed by the treasury in order to investigate the horsepower rating of motor cars has now issued its report. The recommendation of the committee, after hearing all of the evidence, is that the present rating now enforced be retained as regards the taxation of motor vehicles. The committee believes that the majority of those interested in the manufacture of motor cars are in favor of this course, not only because the method of rating is substantially fair as between one car and another, but also because any change of system would lead to a great deal of inconvenience to persons who have made arrangements for manufacturing or dealing in cars in classes suggested by the present system. In view of the fact that an engine with a longer stroke consumes more gasoline by reason of developing more power, therefore this engine pays an additional tax through the imposition of the tax on gasoline.

The committee was appointed December 6, 1911, with the following reference:

"To consider the provisional regulations which have been made under section 86 of the finance act of 1909-10 for determining the horsepower of motor cars, and to report whether any amendments are desirable, with special reference to the equitable treatment of steam cars and electric cars."

The committee has held a number of meetings, and has had before it seventeen witnesses representing manufacturers and the various institutions and societies in connection with the motor car industry. The main point to be considered by the committee related to the effect of stroke-bore ratio, a topic which has been much discussed in recent years by various societies and institutions concerned in the manufacture of motor cars. For example, according to one formula put forward by the Society of Automobile Engineers based upon a large number of engines, the power of an engine of which the bore and stroke are equal should be 33 per cent less than an engine of similar bore in which the ratio of stroke to bore is 2 to 1.

Horsepower of Old Cars

With regard to old cars, a number of witnesses represented that the horsepower of cars made a number of years ago was considerably less than that of modern cars of the same rating. A grievance is undoubtedly felt by many owners by reason of the high tax on a car of little value. The committee, however, has not considered it within its province to make any recommendation as to the taxation of cars which have depreciated in value in the ordinary way.

Steam cars hitherto have been taxed in the same manner as the gasoline car; that is, the steam engine in a car is taken as equal to that of the gasoline engine having equal cylinder area, and where the engine is double acting the rating is correspondingly increased. Since the real horsepower is independent of the engine dimensions, and depends solely on the boiler, the regulations now in force are obviously incorrect. The committee recommends that in regard to steam cars 3 square feet of heating surface should be taken as equivalent to 2 square inches of piston area, which may be regarded as giving 1 horsepower in a gas engine.

The number of electric motor cars is comparatively small, and are all used in this country for one kind of service—namely, town work. Most of these vehicles are fitted with motors rating at 8 horsepower, and as the result of experiments carried out by the committee, it is found that at 20 miles per hour about 7½ horsepower has been used. They are of the opinion that these cars can be described with sufficient accuracy as exceeding 6½ but not exceeding 12 horsepower, and recommend that the regulations dealing with them be amended accordingly.

Recommendations Made

The recommendations of the committee are most conveniently summarized in the form of the following regulations for the determination of horsepower, which might, in the opinion of the committee, take the place of the provisional regulations now in force:

1—For the purpose of these regulations the horsepower of any motor car deriving its motive power wholly from an internal combustion engine worked by a cylinder or cylinders shall be taken to be:

(a) In the case of a single-cylinder engine the horsepower attributable to the cylinder of the engine.

(b) In the case of an engine having two or more cylinders the sum of the horsepowers attributable to the separate cylinders.

2—The horsepower attributable to any cylinder of an internal combustion engine shall be deemed to be equal to the square of the internal diameter of such cylinder measured in inches by a numeral.

(a) In the case of a single-acting cylinder having a single piston, the numeral used as divisor shall be 2.5.

(b) In the case of a single-acting cylinder having two pistons, the numeral used as divisor shall be 1.6.

3—The horsepower of any motor car deriving its power wholly from a steam engine shall be taken to be proportional to the effective heating surface of the boiler supplying steam to such an engine, at the rate of 1 horsepower for every 3 square feet in such effective heating surface, and the effective heating surface shall be taken to be:

(a) In the case of a boiler having horizontal or approximately horizontal tubes, the whole of the surface of the tubes which is exposed to the flame or hot gases;

(b) In the case of a boiler having vertical or approximately vertical tubes, half of that surface of the tubes which is exposed to the flame or hot gases.

4—Any motor car deriving its motive power from an electric motor or motors shall be deemed to be of a horsepower exceeding 6½ but not exceeding 12.

5—In measuring cylinders and boilers, and in calculating horsepower, fractions of inches and feet and fractions of a unit of horsepower are to be taken into account.

6—Where it appears that in consequence of the exceptional design or construction of the engine of any motor car the horsepower as calculated under the preceding rules is substantially less than the average power which the engine would develop in continuous use on the road if there were no restrictions on speed other than those imposed by the car itself, then such average power shall be taken as the power.

The committee also suggests that motor cycles be taxed according to horsepower, and that the horsepower be determined as in the case of motor cars, a new class comprising cars of less than 3 horsepower being added to the schedule of rates of taxation in the finance act.

NEW FRENCH RATING PROBABLE

Paris, Sept. 18—France is about to adopt a new official horsepower rating for taxation purposes. Up to the present taxation has been paid on the catalog denomination of horsepower, the authorities having the right to refuse the manufacturer's declaration of power if they considered it too low. They appeared to have no formula for determining horsepower, but merely estimated on what the motor should give by the cylinder bore. Thus, a four cylinder motor of 4 inches bore was officially rated at 21 horsepower, without any consideration of length of stroke or number of revolutions. A 3.1 inch bore was rated at 12 horsepower, and a 6-inch bore at 45 horsepower. If a manufacturer used two figures, as 20 30, the higher of the two was taken.

The rating was manifestly low, for it was based on the assumption that only one half of the maximum power, as delivered during a bench test, was ordinarily available at the road wheels under normal conditions of running. It also had the disadvantage of causing manufacturers to rate their cars low, thus affording users the benefit of the minimum taxes, but giving a poor impression among non-technical buyers; or of giving a high-sounding rating with increased taxation for the owner. In many cases manufacturers have overcome the difficulty by merely indicating bore and stroke of the cylinders.

The new official rating, which, after being approved by the minister of finance, probably will go into force for the year 1913, is based on the following formula:

$$P = K\,n\,D^2\,L\,w,$$

in which P indicates the horsepower; K is a numerical coefficient to be determined; n the number of cylinders; D the bore of the cylinders; L the piston stroke; and w the angular velocity of rotation. The coefficient K will be 0.00020 for single cylinder motors; 0.00017 for twin cylinders; 0.00015 for four cylinders, and 0.00013 for motors having more than four cylinders. The coefficient K has been selected with a view to determining the power normally available at the road wheels and not the power developed under the favorable conditions of a bench test.

Electric Car Makers Have Show Inning

More Than Sixty Machines Being Displayed in Boston Exhibition

BOSTON, Mass., Sept. 28—Boston's long heralded electric show opened here tonight and the old hackneyed expression "a blaze of glory" was really a fitting one to describe it. For a distance of about a mile on Huntington avenue there are flaming arcs on each side of the street, there being 216 of these, so that persons traveling along find themselves walking through a lane of brilliancy never before equaled in Boston. On the outside of Mechanics' building, where the show is being held, there are 45,000 lights of varying hues. Inside the building there are 200,000.

There are sixty-two machines in the building now, and a few more may be brought in early Monday, so that the total may reach seventy when the show is well under way. Of this number there is a very close division between pleasure and commercial types, and while a quick glance at the machines would lead one to believe that the pleasure cars outranked the business ones, a count shows that they do not, for there are thirty-three commercial to twenty-nine pleasure vehicles. This is an indication of the future of the industry.

These machines are displayed by eighteen different makers. In what is known as Machinery hall, the section of the building forming the triangle reaching out toward Copley square, the motor cars are displayed. They take up more than half the room,

On the right of the main aisle the Buffalo Electric Co. exhibits three machines, two coupes and a roadster. One of these is equipped with wire wheels, the first of its kind to be shown in Boston. Directly across the way J. S. Harrington & Co. are showing the Flanders colonial electric. Adjoining the Flanders is the space of the Waverley electrics being shown by the J. W. Bowman Co. There are two pleasure types of closed models, and one light delivery wagon. Also on the same side of the aisle is the Anderson Electric Co., of Detroit, showing the Detroit electrics, for which a branch was recently established here. There are four vehicles there. Two of these are the coupes showing the design where all passengers face the front; the other pleasure vehicle is the roadster and there is a light delivery wagon.

Taking up the greater portion of the right hand side of the main aisle adjoining the Buffalo electric is the General Vehicle Co.'s main exhibit. This comprises five trucks of varying sizes and two of the little trucks used in railroad stations for handling baggage. Across the way the S. R. Bailey Co., of Amesbury, is showing three of the new models known as the business man's roadster.

On the right hand aisle the Walker Vehicle Co., of Chicago, a concern new to Boston, is making a display of four trucks and a transmission. The Atlantic Electric Co., of New York, is represented by one truck. The Century company did not have its exhibit complete on opening night, the cars being delayed in transit.

The General Motors Co. has a good show. There is a coach that is new to this section and three trucks that vary in capacity. A chassis also is shown, the only one there, by the way, so that visitors may learn something about its construction. The Baker commercial line is being exhibited by Frank N. Phelps. Conspicuous in the space is the new ambulance about to be delivered to the town of Swampscott. There are also a light delivery wagon and a truck on view. The Baker pleasure line is shown by A. F. Neale and it is made up of the roadster and coupe, the latter the new model with revolving front seats, allowing the passengers to face in any direction.

The Studebaker is represented by commercial vehicles, only the three exhibits utilizing space designed for two. This is brought about by an ingenious arrangement. There is a large truck and on the platform of this vehicle is the light delivery wagon, both vehicles utilizing the one space. The other model is a light delivery wagon also. The Lansden Co. is exhibiting three delivery wagons, while the Ohio is represented by one of the pleasure types, a coupe. A. P. Underhill is showing one of the new models of the Grinnel cars, for which he recently took the agency. The Rauch & Lang Co., represented by the Tiffany company in Boston, has a fine exhibit comprising four models, three closed types and a roadster.

Down below the Tyler Brothers' corporation are showing the Columbus electrics that they have taken on within a few weeks. They got space so late it was impossible to get upstairs. The General Vehicle Co. has a supplementary display of three trucks down here, too. Other makes represented down stairs are the Bailey, Waverley, Lansden, Baker and Walker, the latter three commercial types.

The various makers of storage batteries are all represented by prominent spaces, such as the Exide, Edison, Gould, American, Philadelphia, etc. The Edison Electric Co. has a garage exhibit showing how the electrics are charged.

CHICAGO SHOW DRAWINGS

New York, Oct. 2—Special telegram—Official drawing took place this afternoon at the headquarters of the National Association of Automobile Manufacturers for the Chicago pleasure-car show and also for the commercial-car show to be held following the pleasure-car show. As formerly the Coliseum, Coliseum annex and Coliseum basement and First Regiment armory will be used for both shows by the promoters of the affair.

Eighty-two car concerns already have reserved space and three-quarters of the center space of the armory has been reserved for electrics, which have not drawn yet. On the main floor of the Coliseum are thirty-nine exhibitors, the Coliseum annex has eight, Coliseum annex basement seventeen, while the armory will have eighteen exhibitors.

In the Coliseum the exhibitors are arranged in four central spaces and also around the wall as formerly. To the left of the center aisle on entering are Peerless, Flanders, Pierce and Haynes, and on the right of this aisle from the entrance are Glide, Buick, Cadillac and Maxwell. Other center floor exhibitors are Stevens, Stearns, Winton, Stoddard, National, Hudson, Packard, Premier, Reo, Franklin, Locomobile, Studebaker, Oldsmobile, Pope, Chalmers and Overland.

Around the Coliseum walls or under the gallery are Selden, Columbia, Auburn, Rambler, Fiat, Marmon, Alco, White, Cole, Case, Imperial, Mitchell, Moon, Oakland, Lozier.

In the Coliseum annex are American, Kissel, Cartercar, Knox, Velie, Inter-State, Hupmobile and Garford. In the basement of the Coliseum annex are Colby, Paterson, Halladay, Lexington, Cino, Midland, Ohio, Crow, McIntyre, Cunningham, Edwards, Herreshoff, Republic, Metz, Bergdoll, Davis, Elkhart and Mercer.

In the First Regiment armory are Jackson, Austin, Matheson, Abbott, Michigan, Regal, Cutting, Kline, Pathfinder, Staver, Pullman, Krit, Westcott, McFarlan, Great Western, Stutz and Speedwell.

For the commercial car exposition, spaces were assigned to the following companies: Coliseum center: Buffalo electric, Jeffery, Reo, Selden, Autocar, Waverley, Adams, Kisselkar, Speedwell, International, Gramm, Pope, Locomobile, Pierce, Velie, Buick, Peerless, Federal, Hupmobile, Kelley.

Coliseum, along the walls: Durable Dayton, Sternberg, Alco, Walker, U. S. Motor, Garford, Rapid, Reliance, Knox, Krebs, Old Reliable, Clark, McIntyre.

Coliseum annex: Bowling Green, Universal, Service, Standard, Transit, Dart, M. & P. electric, Lippard-Stewart.

First Regiment armory: Chicago Pneumatic, International Harvester, National motor truck, Sanford, Commerce, Four-Wheel Drive, Gramm, Bernstein, Poyer, Bessemer, Harwood, Barley, General Vehicle, Avery, Packard, White, Alden Sampsen, A. L. Smith, Lauth-Juergens.

FAMILIAR VIEW OF RUSHING WATERS IN GLACIER NATIONAL PARK

SAMPLE OF ROAD IN FLATHEAD COUNTRY, MONT.

Good Roads Found in the Scenic Flathead Country

By Frank D. Stoop

SPEAKING of good roads and good roads work, probably no place in the United States can show any more marked improvement than the northwestern part of Montana for the past season. The creation of Glacier national park and the movement to connect Yellowstone national park with it by the Park-to-Park highway have set everyone to thinking about good roads.

During the past season, a road has been opened from Kalispell, Mont., north through Gateway into Canada, and several cars have passed to and from points in British Columbia and the United States. Very little trouble is experienced in taking cars back and forth, and in fact the authorities are encouraging touring, instead of placing anything in the way. From Kalispell to the boundary line is about 85 miles, and, once across the line, the roads are equally as good as ours.

On July 28 the Flathead Motor Club made a run from Kalispell to Eureka over this road, and although the road was not in perfect condition, owing to recent rains, the distance of 75 miles was driven in about 4 hours. Most of the cars returned the same day, but the writer spent several days touring further north into Canada. The most thrilling part of the trip was encountered when crossing Elk River canyon about 8 miles south of Elko, where there was a 480-foot drop which registered by the speedometer just 6-10 of a mile. The road was hard and no difficulty was experienced. The scenery was magnificent.

About 75 convicts are working in Flathead county on the east side of Flathead lake, constructing a regular motor car road which will be part of the Park-to-Park highway to allow tourists to travel

ATIONAL PARK IN NORTHWESTERN MONTANA

ROAD BUILT BY CONVICT LABOR ON EAST SIDE OF FLATHEAD LAKE

MOST BEAUTIFUL DRIVEWAY JUST COMPLETED TO SWAN PARK

Yellowstone park in condition to be used by motor cars as well as other vehicles. This is the first appropriation secured for the improvement of roads within the park so that they may be used by motor cars, and is intended to provide for improving the roads between the Lake Hotel and the east boundary of the park; Thumb Station hotel and the south boundary, and Junction hotel and the west boundary of the park. With these roads placed in shape for the use of motor cars, tourists can enter the park from the east, south or west and reach the main belt line road which encircles the park.

"It will require an appropriation of $2,000,000 to place the belt line road in condition to be used by motor cars and teams, and eventually I hope this appropriation will be secured so the entire park may be utilized by tourists using motor vehicles. In addition to securing the appropriation of $77,000, for the improvement of the roads within the park, I was able to obtain $10,500 for improving the roads within the forest reserve south of the park to Jackson and through Hoback canyon. With these improvements the roads from Rock Springs to the south boundary of the park will be made suitable for motor travel.

"I also secured $4500 for improving the road in the forest reserve between the east boundary of the park and Cody, Wyo., and with these improvements and the improvements of the road within the park from Lake hotel to the boundary, motor travel may be inaugurated from Cody to Lake hotel. In addition to these specific items, the state of Wyoming will receive upwards of $20,000 for general road improvements within the forest reserves."—Robert N. Carson.

PLANNING FLORIDA TRIP

Milwaukee, Wis.—Editor Motor Age—I intend to take a trip from Jacksonville, Fla., to West Palm Beach with my car and would like directions. I will ship from Milwaukee to Jacksonville. Will I have to take out a license in Florida?—Dr. T. C. Gelhaar.

Jacksonville to Ormond is 90 miles, all but 18 miles being a poor sandy road. Take the South Jacksonville ferry and continue to St. Augustine, Moultrie, Bulow turpentine camp, and Ormond. Follow through Sea Breeze, Daytona, Port Orange, New Smyrna, Titusville, and along the river to Coco and Rockledge, 75 miles; Rockledge to Fort Pierce is 75 miles and the intermediate towns Eaugallie, Melbourne, Maco, Sebastian, and Quay; then to Palm Beach the mileage is 68 and the trails faint. You pass between two small lakes, the road being very soft mud, then continue to Jupiter and Riveria.

Thirty days are allowed non-residents in Florida and the home state tag must be displayed.

For running directions, etc., you are referred to the Blue Book No. 3.

MILWAUKEE—PALM BEACH

Milwaukee, Wis.—Editor Motor Age—I am going to make a trip to Florida in the near future, and would like a route to Cincinnati, O. and on to Palm Beach.—E. Raisch.

One of the best fast roads to Chicago, a distance of 95 miles, is Kilbournville, Sylvania, Everett, Deerfield, Northfield, Grosse Point, Wilmette, Evanston, and through Lincoln park into Chicago, making Rensselaer, Ind., that night with 86 miles through Jackson park, Bryn Mawr, South Chicago, Whiting, East Chicago, Grasselli, Gibson, Hessville, Highlands, Schererville, Crown Point and Thayer. Next day the routing is Enos, Morocco, Brook, Fowler, Oxford, Montmorenci, Lafayette, Dayton, Mulberry, Jefferson, Frankfort, Cyclone, Kirklin, Augusta, and Indianapolis, with 154 miles for the day. It is an enjoyable 119 miles to Cincinnati through Hawthorne, New Palestine, Fountaintown, Gwynneville, Arlington, Rushville, Connersville, Evarton, Blooming Grove, Brookville, Cedar Grove, New Trenton, Harrison, Miamitown, Cheviot, Westwood and Cincinnati. Another beautiful stretch, particularly so in the fall, is to Louisville, 135 miles, by way of Cleves, Elizabethtown, Lawrenceburg, Aurora, Rising Sun, Oberdeen, Markland, Vevay, Carrollton, New Castle, Shelbyville, Simpsonville, Middletown, St. Mathews, and Louisville.

The answer to the Saginaw, Mich., inquiry will serve you to Columbia, Tenn., from which point you route directly south to Birmingham, Ala., 177 miles, through Pulaski, Elkmont, Blowing Springs Hollow, Athens, ferry to Decatur, thence on to New Decatur, Flint, Hartsells, Falkville, Lacon, Cullman, Hanceville, Garden City, Bangor, Blount Springs, Warrior, Kimbery, Morris, Gardendale, Louisburg, Artesia Springs and Birmingham.

Routing 190 miles to Atlanta, Ga., the towns are Gate City, Trussville, Argo, Springville, St. Claire Springs, Asheville, Greensport, Peeks Hill, Anniston, Oxford, Iron City, Edwardsville, Talapoosa, Waco, Bremen, Temple, Villa Rica, Winston, Douglasville, Austel, and Mableton. Between Atlanta and Augusta there is mostly gravel roads. The 171 miles

'er over the Omaha-Denver transconti-
ental highway, then south through Colo-
'ado to New Mexico, or follow the Meri-
lian road into Kansas as far as the Santa
'e trail at Newton, then west to Colorado
nd through the southern corner to La
'unta and Trinidad and into New Mexico.

Over the Omaha-Denver trail it is a
un of 166 miles to Hastings, the interme-
iiate towns being Millard, Gretna, Ash-
and, Waverly, Havelock, Lincoln, Em-
rald, Milford, Friend, Exeter, Fairmont,
utton, Saronville, Harvard and Hastings.
deCook is then reached after 146 miles
f travel through Junita, Heartwell, Min-
len, Axtell, Holdredge, Atlanta, Oxford,
dison, Arapahoe, Holbrook, Cambridge,
artley, Indianola. McCook to Sterling,
'olo., is by way of Culbertson, Bev-
rly, Palisade, Hamlet, Wauneta, Im-
erial, Lamar, Holyoke, Paoli, Haxton,
'leming, and Galien, and is 167 miles.

Next comes the stretch of 146 miles to
enver through Hillrose, Brush, Fort
Morgan, Bennett, Watkins, Denver. Be
ure and have enough gasoline to carry
'ou the 64 miles from Fort Morgan to
Bennett, as that stretch is withou

Traveling south the towns are
ton, Ascequia, Sedalia, Perry Pa
mer Lake, Monument, Custard,
Pike View, Colorado Springs, F
Buttes, Pinion, Bragdon, and
which is 112 miles. Then comes T
at 90 miles, going through Wals
Acuilar Chicosa, and Bowen.

Trinidad to Las Vegas, N. I
miles—is Starkville, Gallinas,
Raton, Dorsey, Maxwell, French, S
Rayado, Colmor, Nolan, Wagon
Watrous; Las Vegas to Santa
miles—is Tecolote, Bernal, San Jo
jarita, Rowe, Pecos, Glorieta, Ca
Santa Fe. To McCarty's it is 149 m
way of La Bajada, Domingo, Alg
Bernalillo, Sandia, Alameda, Albuq
Atrisco, Laguna, and Cubero; co
134 miles to Nation's ranch, Lagu
lina and Springerville. To Glo
through Cooley's ranch, Rice and
being 148 miles, and then to Phoen
miles over a fine stretch of road th
Roosevelt, Goldfield, Mesa, Franke
and Tempe.

ON PARK-TO-PARK HIGHWAY NEAR KALISPELL, MONT.

Adjustment of I. H. C. Car

Particulars of Construction and Adjustment of Principal Parts of High Wheeler Given

FRANKFORT, Ind.—Editor Motor Age—What is the bore and stroke of the 1912 I. H. C. motor wagon?

2—What make of carbureter is used, and please explain the adjustment of it?

3—What make of magneto is used on this car? Give wiring diagram.

4—What kind of transmission is employed?

5—In what way is the compression released when cranking this motor?—A Reader.

1—The bore and stroke are 5 by 5 and 4½ by 5, the former, the air-cooled model, and the latter the water-cooled.

2—The carbureter is a Schebler, shown in Fig. 1.

To adjust the carbureter, see that the air-valve A just seats. This can be felt with the fingers when the throttle is open. It is adjusted by the adjusting screw S, which is turned to the right to increase the tension on the spring. Next close the needle-valve N, and then open about five-eighths of a turn. See that the cold-air shutter C is closed except possibly the small notch in the shutter. The throttle lever on the steering post is then pushed forward.

Start the motor, retard the spark, throttle down the motor to a walk. Then turn the needle valve to the right slowly, until the motor begins to pop. This will be because the mixture is too lean. Open it very slightly again until the motor runs smoothly. Then open the throttle and advance the spark until the motor is running at high speed. Turn the screw S to the left until the motor misses or backfires, when it should be turned to the right again until it runs smoothly. The lock nut L is then screwed down to retain this adjustment.

3—The wiring diagram of the Heinze ignition system which is used on this car is shown in Fig. 2. The I. H. C. uses a Heinze magneto.

4—The I. H. C. gearset is of the individual clutch type, with the gears always in mesh. Selection of gears is obtained through dogs and pawls in the gear hubs. It affords two speeds forward and one reverse.

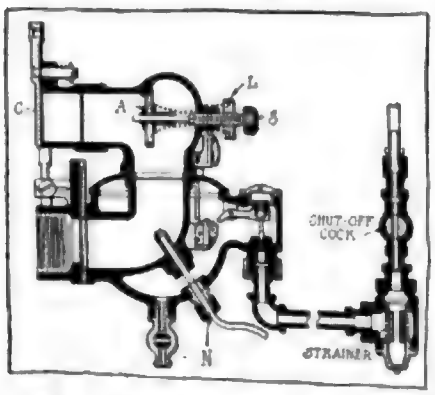


FIG. 1—SCHEBLER CARBURETER OF I. H. C. CAR

5—There are priming cups on the tops of the cylinder that may be used for this purpose. No regular provision for this is made.

The Readers

Carbureter Adjustment on International Harvester Car—Horsepower Not Reliable Gauge of Gasoline Economy—Forward Cylinders Carbonize Most

POWER AND FUEL CONSUMPTION

Piper City, Ill.—Editor Motor Age—Is a two-cylinder car of from 16 to 18 horsepower cheaper to operate than a four-cylinder car of from 20 to 22 horsepower?

2—In a thermo-syphon system is it necessary to have the radiator full for the water to circulate?—A Reader.

1—This is a question that cannot be definitely answered. To discuss it from a theoretical standpoint, however, the smaller motor would consume less gasoline per charge than the larger, as the volume of its cylinders would be less than that of the four. On the other hand, no two designs will operate with exactly the same density of mixture, and it is quite likely that the smaller motor, because of the decrease in mechanical and thermal efficiency in motors as their size is decreased below certain limits, and the fact that it has but two cylinders, would require a somewhat richer mixture, when operating under similar conditions than that required by the four.

Of course, there can be no means of determining how the effect of the volume and the thermal and mechanical efficiency would balance; whether the decrease in volume would overbalance the waste of the more inefficient design, or vice versa, in two motors equally well designed for their respective types, of the sizes you specify. It is quite likely, however, that in sizes so nearly the same, that the difference would be very slight. A four of this size needs to be very well designed to show any considerable degree of efficiency, due to the fact that its cylinders are small, and therefore demand that the rest of the motor be made correspondingly light and finely balanced if great efficiency is to be had. As against this, though, the small motor is required to stand up under usage but very little different from that of the big six, and its component parts must therefore be made with a much greater margin of strength than those of the larger motor, to which the strains and loads of service are less, in proportion. To narrow the discussion down again the actual economy of fuel, either motor could be so designed that it would exceed the standard of the other type in this point, but considering the balance of the whole design, it is unlikely that any appreciable difference would obtain in two motors correctly balanced for their design, in fuel economy.

3—No, not any more so than systems wherein a pump is used to induce circulation. The inflow at the top is caused by the rising of the water in the jackets, due to the heat, whence it runs down through the radiator, as it cools, and flows back to the lower portion of the cylinder jackets, and it will continue to circulate as long as there is any water in the radiator.

FRONT PLUGS FOUL

Sauk Center, Minn.—Editor Motor Age—I have a 1911 model T Ford, the first time I took out the spark plugs for cleaning I noticed that the two nearest the radiator were very dirty, while the two next to the dashboard were perfectly clean. The first two cylinders are getting much more oil than the other two, although the former do not show any sign of wear more than the latter. Can Motor Age suggest a remedy for this?—Reader.

Since carbon is the result of oil in such a degree of excess that it is burned in the cylinder, it is to be inferred that the two front cylinders of your motor are receiving an excess of lubricant. Unequal feed to various cylinders of a motor is to be attributed to various and sundry causes, among which are: loose piston rings, which do not fit the cylinder snugly, allowing too much oil to enter the combustion chamber; worn cylinders; scored cylinders, the scorings forming tunnels past the piston rings through which an excess of oil is allowed to pass; oil level carried too high; or too much splash.

Considering the first possibility, the piston rings may become loose through excessive wear. This may be the result of running the motor dry at some time, ill fitting rings in the first place, soft material in the rings, or merely the result of legitimate wear. Loose rings may be the result of loss of temper, caused by inferior metal or treatment thereof, or to overheating the engine at some time. Other causes are the distortion of the rings, due to faulty material or workmanship, or to the lining up of their slots, affording a continuous passage for the oil, even though each part may be in perfect condition.

Cylinders become worn because of lack of lubrication, ill fitting rings, or misalign-

Clearing House

Steam Not Dangerous if Radiator Is Full and Does Not Spout Water—Reasons for Customary Crank-Angle—Reader Discusses Gasoline Cost

ment of the piston or its mountings. They become scored by broken piston rings, foreign matter in the cylinders, projecting wristpins, or valve grinding compound which has been allowed to find its way into the cylinder by a careless repairman.

It would appear on first sight as though a high oil level would affect all cylinders alike, but this is not necessarily so. The rear cylinders may have their rings too tight so that the oil level is required to be carried too high in order to properly lubricate them, at the expense of feeding the front cylinders an excess of oil. Too much splash may be the result of bent oil spoons, which owing to their angle splash more oil to the front cylinders than to the rear ones. The rear spoons may be bent so as not to splash sufficient oil, so that the oil level has to be carried excessively high to allow them to be supplied.

Another cause of uneven carbonization, rarer, and less likely, but possible, is an air leak in one side of the manifold, which thins the mixture to one pair of cylinders, to such an extent that the carbureter must be adjusted to produce an abnormally rich mixture to counteract this effect, with the result that the other cylinders, farther from the air leak, and therefore less affected by it receive an over-rich mixture, with resultant carbonization. Loose connections to the spark plugs on the front cylinders would increase the resistance to the high-tension current, and retard the timing of the spak thereby. Late spark advanve always has the effect of increasing the carbon deposit.

The remedy of these troubles, is to inspect the parts most likely to be the seat of the trouble, and if imperfect, to repair or replace them.

OVERHEATING THE ENGINE

Kimball, S. D.—Editor Motor Age—I have been told that a too lean mixture will heat a motor car engine as quickly and badly as too rich mixture. What do you know about it?

2—Granted that an engine runs perfectly, has all kinds of speed and consumes the minimum amount of gasoline, can it overheat an engine?

3—Taking the case of an E-M-F engine, which uses the splash system, how long and how far is it safe to run such an engine with the water boiling and steaming, provided that the radiator is kept full all the time, this in case of heavy roads on low gears?—C. R. Tinan.

1—It will not.

2—No.

3—Provided there is no steam in your jackets, no harm can come of boiling water, provided your radiator is kept full. Steam in the pipes or jackets will make its presence manifest by spouting water from the radiator cap. This is the danger sign. As long as only steam escapes, you are safe, for it is formed, then, only in the air space at the top of the radiator. Boiling water is of practically uniform temperature; steam may be heated indefinitely.

RAMBLER RATIO

Penn Yan, N. Y.—Editor Motor Age—With a 36-inch wheel and with sixteen teeth on the small sprocket of the speedometer, how many teeth should there be on the larger sprocket so as to give the correct speed?

2—What is the speed of the model 53 Rambler?

What are the gear ratios of this model?—L. S. A.

1—By the formula given for speedometer sprocket sizes, in the issue of August 29, a sixteen tooth small sprocket on a 36-inch wheel takes a 72-inch large sprocket. The size of the large sprocket is found if the small sprocket has 16 teeth by multiplying the inch-diameter of the wheel by two.

2—The maximum speed of this model is said to be about 40 miles per hour.

3—The gear ratio or direct drive is 3.5-7 to 1, on intermediate 6 to 1, on low 8 to 1, and on reverse 11 to 1.

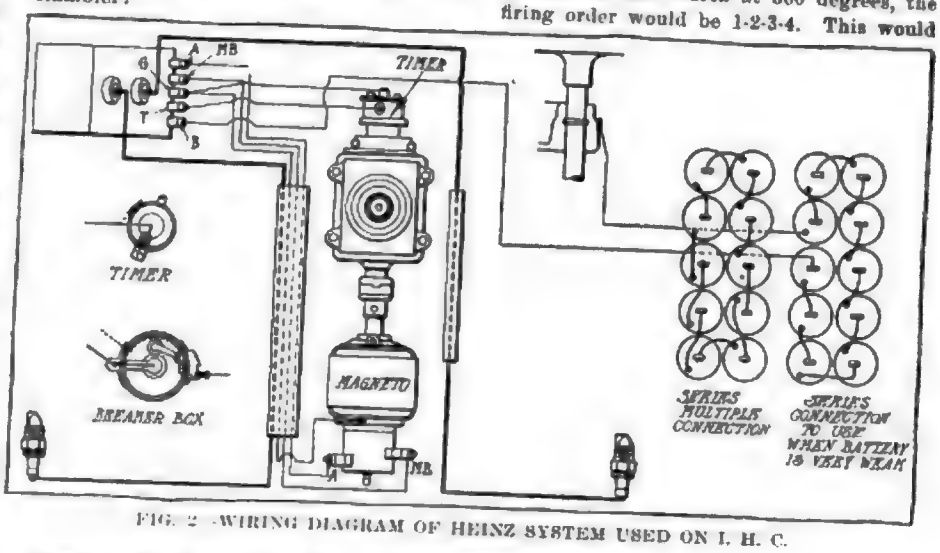


FIG. 2—WIRING DIAGRAM OF HEINZ SYSTEM USED ON I. H. C.

Angularity of Cranks

Why Cranks Are as They Are, and Effect on Firing Order and Running Balance

URBANA, Ill.—Editor Motor Age—Why is it that on a four-cylinder and four-cycle engine that the first and third crank cannot or at least is not set at 350 degrees and the second and fourth at 180 degrees?

2—Is the Ford steering wheel considered as safe as the worm and sector type, and what is the maximum speed of the Ford car?

3—Is the Remy magneto used on the Moon and Enger cars high or low-tension?

4—How many volts does it require to force the current across a 1/32-inch air gap of a spark plug under compression pressure?

5—What kind of ignition system and carbureter does the Marmon car use?

6—State high or low-tension and the kind of coil. Give same answer on the Thomas Flyer, National, Chalmers.—Chauffeur.

1—The reason for the universal practice in the design of four-cylinder crankshafts of turning the first and fourth crankshafts at 180 degrees angle, and the second and third at 360 degrees, is that better balance is said to result from the resultant firing order. If the throws were alternate, the first and third being at 180 degrees, and the second and fourth at 360 degrees, the firing order would be 1-2-3-4. This would mean that the pressure on the crankshaft, and upward on the engine cylinders, would travel from one end of the motor to the other in waves, tending to raise first one end of the motor, and then the other, with the result that the motor would rock violently in the chassis. By so designing the crankshaft that the firing order is more evenly distributed, the pressure is balanced, each alternate explosion bringing its pressure to bear on a different portion of the motor, instead of two explosions occurring at one end of the motor, and then two more at the opposite end. Fig. 3 shows a motor firing in the se-

quence 1-2-3-4, with the crank throws alternating, the effect of the unbalanced pressure being shown by the broken lines. Fig. 4, on the other hand, shows a motor with the crank throws arranged in the standard manner, with the firing order 1-3-4-2, with the better balance that is apparent.

Dissatisfied with following standard practice, without a practical reason for so doipg, one manufacturer several years ago built a motor which fired 1-2-3-4, and on installing it in a car was hardly able to keep it in the chassis. On changing the firing order, by installing a standard crankshaft, the difficulty was removed immediately.

Another maker, however, disagrees with this practice, maintaining that difficulties with motors which fire 1-2-3-4 are the result of poor balance of the component parts of the motor, rather than of actual rocking. This maker maintains that now since the importance of perfect balance of the moving parts of the motor is generally understood, and that even the static balance of the flywheel, etc., is insisted upon, that any firing order desired may be adopted that will adapt itself to the location of the bearings, and the design and balance of the crankshaft. It is asserted that a six-cylinder motor with a firing order of 1-2-3-6-5-4 shows no increase of vibration over one wherein the firing order is broken up and distributed as in the sequence 1-4-2-6-3-5, and that therefore a four, designed in good balance, could be fired in the order 1-2-3-4.

Which is right is hard to say, but it is probable that the truth lies between the two; and that if the motor is perfectly balanced in its working parts, it may be designed for any firing order, but unless the balance is perfectly true, the progressive order of firing will induce rocking that would be ruinous to both the engine and its associated chassis members.

2—Yes, this steering gear operates on a simple reduction of 4 to 1, which with as light a car as the Ford provides complete and safe control, and considering the difference in cost between this type and the worm and sector type that is saved, the Ford company regards this type as superior to it. The Ford car should be able to do 40 miles per hour.

3—The Moon and Enger cars use high-tension systems.

4—Approximately 12,000 volts under the usual compression.

6—The Marmon use a dual two-point ignition sytem, with a Remy magneto, and a float-feed single-jet, water-jacketed Schebler carbureter.

7—The Marmon uses a high-tension system with a Remy vibrating coil. The Thomas uses a high-tension system with either a Bosch or Eismann vibrating coil, on option, to correspond with the make of magneto selected by the purchaser. The National uses a high-tension system, with a Bosch vibrating coil. The Chamers uses a high-tension system with a Splitdorf coil.

HIGH COST OF GASOLINE

Du Bois, Pa.—Editor Motor Age—What are we going to do about the high cost of gasoline? This is the important subject which all car owners should be considering. Since spring, the price of gasoline has advanced from 11 to 20 cents a gallon delivered in barrels. The gravity claimed for this gasoline is 64 per cent, but very seldom registers this on test.

The reason given by the refineries for this excessive price is the scarcity and the increasing amount of its use. One company practically controls all the gasoline of the world. Since this company's dissolution, this spring, the alleged competition among the different companies has forced gasoline higher and higher, until in the short time of 3 months, it has almost doubled in price.

Another point worthy of note is that the quotation of this company's stocks have advanced step by step with gasoline. It is well known that in cities and towns farthest from the refineries, where there is small competition, gasoline is much cheaper than in towns surrounding the refineries. If the price is only controlled by the scarcity, why should western Pennsylvania be paying 4 cents more a gallon than New York city?

In the refining of gasoline, for every gallon of gas produced 4 gallons of kerosene also appears. As the demand for gasoline has increased, the use of kerosene has decreased, making it appear much as if the gasoline user is paying for the kerosene which the refinery is unable to dispose of.

What is going to be done about it? It is up to the motor car people of today to get busy on this proposition and devise a way to overcome this high cost. Are we going to allow the price to go on soaring until only a millionaire can afford to operate a car? What side of the ledger will the upkeep of a truck be with the high cost of gasoline in comparison with horses? Are we going to equal England and France in their prices of 37 and 40 cents a gallon? At present, the Royal Automobile Club of England is investigating the excessive cost. 6½ cents covers the expenses of delivery at Thames Haven dock with a duty of 6 cents more, leaving 24½ cents on every gallon clear profit.

The foreigners are building their engines with the idea of maximum power from the minimum gasoline, and in so doing have built small-bore and long-stroke motors. The American manufacturers have copied this idea to some extent the last 2 years, but whether for the idea of low consumption of gasoline, they have not made known. The manufacturers must be very conservative in cutting down bores, as our road conditions are entirely different from the foreigners, and it will be some years before they will be in the condition which these small-bore motors demand. Another point which our American manufacturer has not fully absorbed is that the foreigners use four-speed transmission to help their small motors.

The high cost of gasoline is vital to the manufacturer of cars and carbureters, for the high cost of upkeep will kill a great many sales. The market which has just been opened for cheap cars will be the worst sufferer from the high cost of upkeep.

Kerosene and benzine, now selling for 11 and 16 cents, are the only cheap fuels which are in any way suited for engine use. Kerosene in its present form is

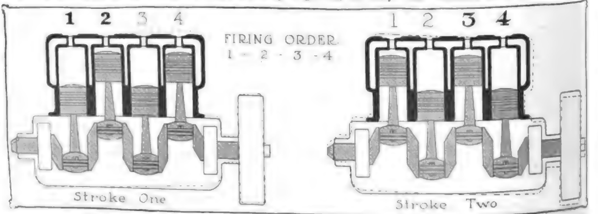


FIG. 3—EFFECT OF ALTERNATE CRANK-ANGLES ON FIRING ORDER AND RUNNING BALANCE

hardly suited for engine use, as it will only generate a gas in a hot engine, and leaves an excess of carbon. The warming-up process could be taken care of by building a small tank within the large one and using a two-way valve. After warming the engine with gasoline which would be carried in the small tank, the kerosene could then be turned on. If this necessitated the adjustment of the carbureter, it now being equipped with a dash adjustment. But to devise a way to overcome the carbon, that is a different matter, and one for the manufacturers to investigate.

Benzine is our only relief, and yet it is a great deal higher at 16 cents a gallon than it should be. It is not very well known that benzine contains more power and mileage to the gallon than gasoline, its only disadvantage being the difficulty of starting in a cold engine. Now that the cold weather is near, the difficulty will be more pronounced than in the summer, but would be a very easy matter, most cars can be remedied by priming or the double tank, which I have previously mentioned. The present engines and carbureters are well suited to this fuel and some will not even require the adjustments to be changed. Since we have the self-starter, we can afford to have our engines start harder. If people would use more benzine, it would not only bring down the cost of gasoline, but would be more profitable to the consumer.

In the fall of 1910, a test was made under the auspices of the Chicago Motor Club, with benzine as fuel. A Falcar, with a Rayfield carbureter, was used, and it was demonstrated that more mileage and power to the gallon could be obtained than with gasoline. Only once was trouble encountered in starting, which was caused by an all-night stop in a cold garage. This difficulty was remedied by priming the cylinders. Since this test, no other progress has been reported by the manufacturers of cars and carbureters towards the investigation of a substitute for gasoline.

It is up to us, through our clubs and motor publications, to fight this advance, and we could make a very creditable fight as 860,000 pleasure cars were registered in the United States, in the registration taken July 1. Let us get together and start a campaign for lower prices. Why can't the American Automobile Association conduct a campaign through the clubs? United we can fight, but separately we shall fail.—W. J. Marlin.

SUGGESTS CAUSE OF KNOCK

Chicago—Editor Motor Age—Referring to the answer to X Y Z on page 27 of the September 19 issue of Motor Age, it may be that the trouble the correspondent is having is caused by a loose wrist pin, which has worked over to one side of the cylinder wall and the wrist pin is sticking out of the piston, making a groove in the cylinder wall of the piston and cutting a groove in the cylinder wall, so the wrist pin is striking the end of this groove at the end of each stroke, making it click and clatter.

SPECIFICATIONS FOR YEAR 1920

Jefferson, Ia.—Editor Motor Age—At this time of announcement of 1913 models perhaps a little harmless speculation by an outside observer of motor car tendencies may not be out of place. What will the purchaser of a moderate priced car get for his money in, say, a 1920 model? Of course any such prognostication must be based primarily on the idea that the public will get what it wants, and that it will want what is best.

Apart from any knowledge of engineering problems and desiderata, it would seem that the light six is to be the predominant car of the immediate future. This motor will probably be of the long-stroke type, with a moderately small bore; to hazard a concrete guess, say 3¾ by 5½ inches. It would appear at present that the poppet-valve construction will be retained, at least for the medium priced car. That this motor will be equipped with an electric self-starting, lighting and ignition system seems almost certain. As to the gearset, I should unhesitatingly agree with our four-speed friends that that will be the prevalent type in a few years. Whether direct drive will eventually be on third or on fourth speed is something that the engineers will have to settle, with the co-operation of drivers. In any case, there will probably be a power tire pump on the gearset, and perhaps a drum and cable to take the place of the proverbial team of mules in a mud hole.

To one who has seen the English results in the matter of tire economy with wire wheels—about 50 per cent over wood wheels in the same service—there will appear to be little doubt that the wire wheel, demountable, probably, will be a universal equipment before the year I have mentioned. The spare wheel probably will be carried on the rear of the car.

To aid the four-speed gearset in getting the most out of a comparatively small engine, we may expect to see the stream-line body developed for the moderate priced car. Clean running boards, four usable doors, and a requisite beauty of line will demand the development of some sort of luggage compartment within the body. Unless springs and roads improve very materially, the public will be demanding, and getting, shock absorbers as standard equipment on all but the cheapest cars.

Though I have driven both, to me the matter of left or right-hand drive is still an open question. In the city, left-hand drive is doubtless better; in the country, right-hand is still preferable, on account of the numerous narrow graded roads. It may be that this matter will be optional. The steering post angle will almost certainly be adjustable, to meet the requirements of drivers of different builds.

Additional equipment will probably be about what it is now on the more liberally equipped cars. That is to say, top, windshield, speedometer with or without clock, tools, etc.

How this car is to be built, and built in a thorough, durable way, and sold at, say, $1,500, I confess has not worried me greatly. Possibly greater economies in the matter of overhead expense and sales methods will make it feasible. At any rate, if we look back at, and argue from, the steadily increasing values of each succeeding year, we cannot doubt that it is both possible and probable that such value will be offered.—Charles D. Enfield.

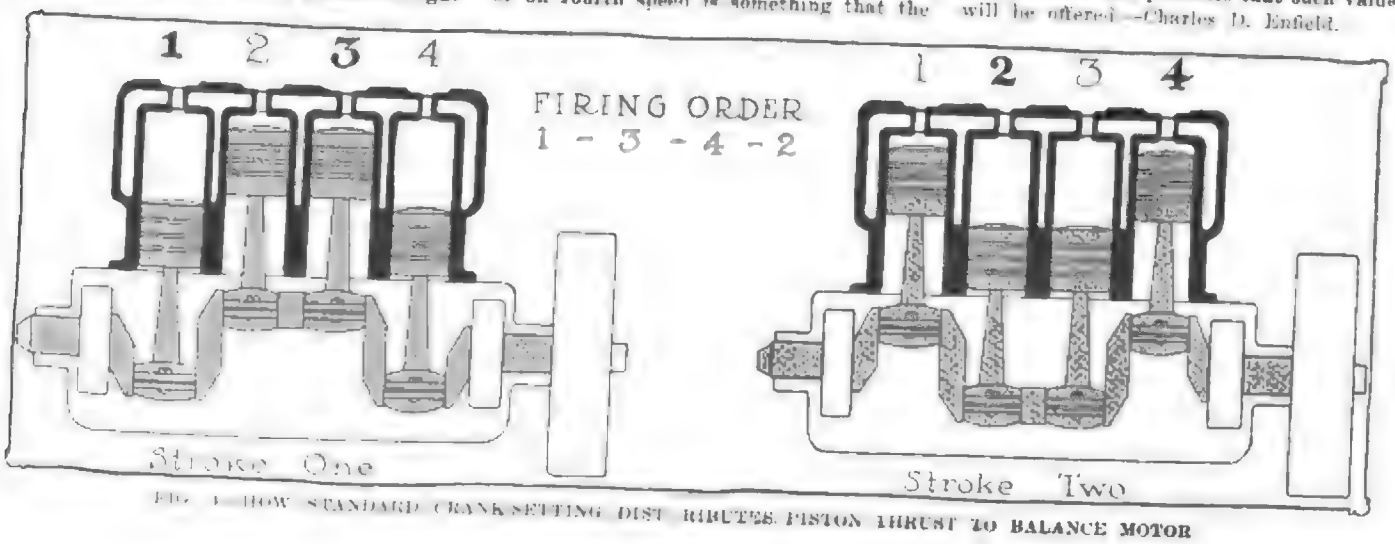
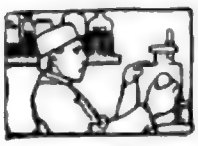


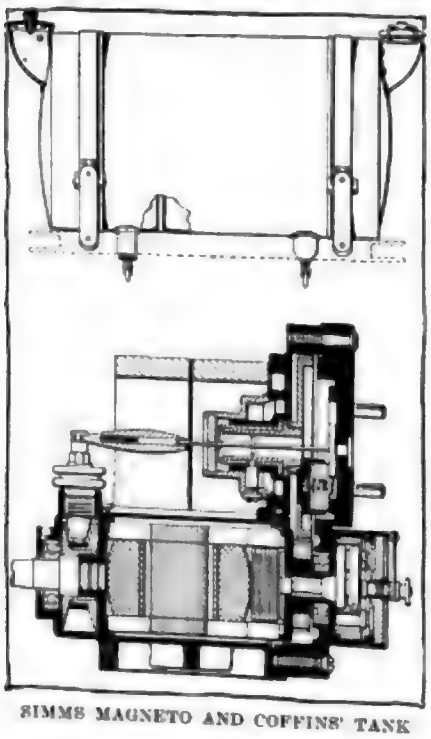
FIG. 1—HOW STANDARD CRANKSETTING DISTRIBUTES PISTON THRUST TO BALANCE MOTOR



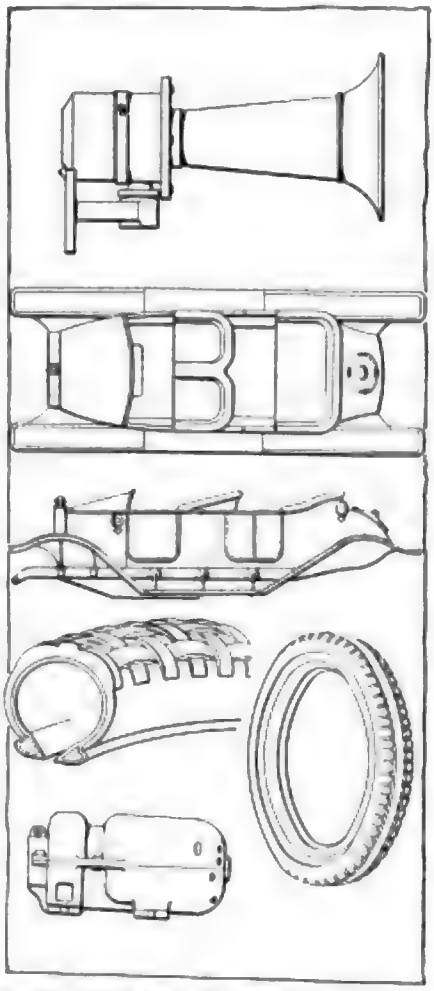
Current Motor Car Patents

MERCEDES Clutch-Actuating Linkage—No. 1,039,495—To Paul Daimler, Untertürkheim, Stuttgart, Germany, assigner to Daimler Motoren-Gesellschaft, Untertürkheim, Stuttgart, Germany. Filed September 16, 1911; dated September 24, 1912. As an operating means for a double cone clutch, the purpose of this invention is to bring the two outwardly engaging members together, and out of engagement with their respective friction mates, by means of a single thrust of the operating pedal. This is accomplished by mounting the two cones which constitute the operating members on annular integral sleeves, disposed about the driven shaft. These sleeves are of different diameters and telescope the forward within the back sleeve. These sleeves terminate in collars, upon which are mounted ball thrust bearings. These bearings are placed opposing and have rollers secured to their inner races. These rollers bear on a wedge-shaped expanding member which is linked to the operating pedal, so that upon the depression of the latter, the wedge is pressed between the rollers, spreading the thrusts, and by means of the sleeves drawing the clutch cones together. The clutch spring is of course mounted between the cones, and bears only on them, thus obviating the necessity of any thrust bearing for this member.

Hudson Gasoline and Oil Tank—No. 1,039,098—To Howard E. Coffin, Detroit, Mich. Filed August 14, 1911; dated September 24, 1912. A tank for runabout bodies, this design consists of a single tank provided with a hollow partition dividing the tank into two compartments of different capacities, one for lubricant and the other for fuel. A means is provided for the drainage of the hollow partitioned chamber of any leakage of oil therein from either storage compartment, and for indicating the presence of any fluid within the central chamber.



SIMMS MAGNETO AND COFFINS' TANK

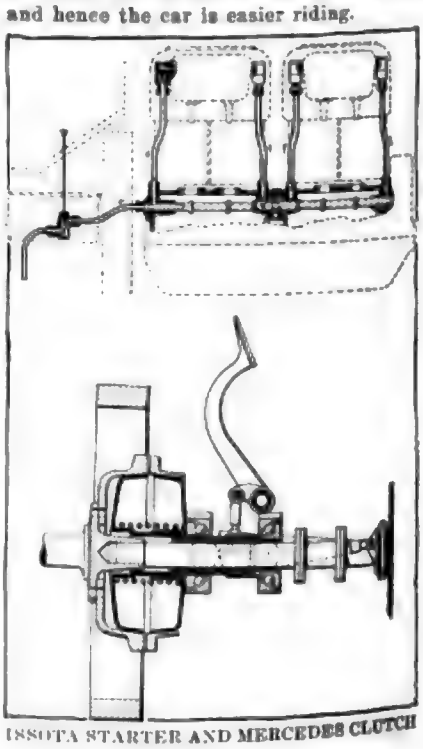


Designs Issued Sept. 24, 1912, Dean Electric Signal—Huffman's Motor Car Body with Inset Motor Hood—Jones Non-Skid Tire—Clark Basket-Weave Tire Tread—Grey and Davis Generator Case

Isota-Fraschini Engine Starter—No. 1,039,504—To Oreste Fraschini, Milan, Italy. Filed June 16, 1908; dated September 24, 1912. This starter is of the compressed-air type, the air being compressed and stored in a tank. From the tank a line conducts it beneath the footboard to the engine. The air is distributed to the cylinders by means of a hollow camshaft, which acts as a rotary distributor, as well as in its usual capacity of valve operation. The individual leads from the camshaft ports lead to the several inlet valves of the cylinders, the rotary camshaft distributor being so timed as to admit a charge of compressed air on the working stroke of the engine cycle of each cylinder. Upon the starting of the engine, the leakage of air back into the air reservoir is prevented by a suitable check-valve connection to the cylinder. The passage of air from the tank to the distributor is controlled from the foot-board by a foot-button that actuates a plunger-valve in the air line.

Simms Magneto—No. 1,039,454—To Frederick Richard Simms, Kilburn, London, England, assignor to Simms Magneto Co., New York, N. Y. Filed October 9, 1911; dated September 24, 1912. A high-tension magneto, this invention consists of a special design for dual systems, having a revolving armature, on which are mounted the revolving brushes. These brushes bear on a stationary commutator, which is provided with connections to the battery and to the cylinder spark plugs.

Huffman Body Design—No. 43,046—To Charles F. Huffman, Mason City, Ia. Filed May 15, 1912. This design resembles that of the English Lancashire cars, inasmuch as the dog-kennel hood is eliminated, the engine being placed in the driver's compartment in an inset hood. It differs from the British product, however, in that two seats are provided in the forward compartment, and the engine compartment does not extend so far back. The dash is divided into two sections at the side of the hood, and sheltered by an exceptionally deep cowl. The seats, both front and rear, are farther forward than usual, and hence the car is easier riding.



ISSOTA STARTER AND MERCEDES CLUTCH

The Motor Car Repair Shop

Repairs of Motor Tires

Part II

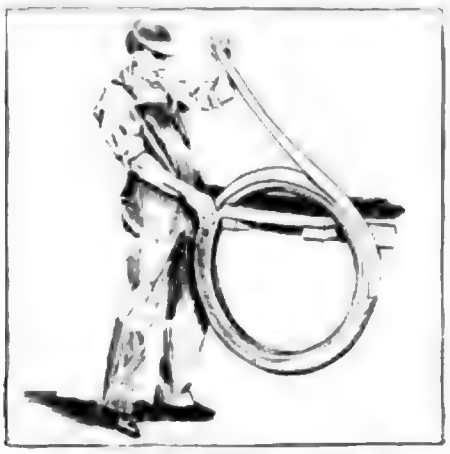


FIG. 1—RETREADING CASINGS

Building Up Raw Gum Tread Bands

AN uncured tread band is composed of four or more plies of gum, which should be built up as needed on a stock table. Do not begin with the widest ply, but with the second widest, cut the next one ¾ inch narrower, and step up in this proportion in accordance with the number of plies required. Then invert the whole upon the widest ply in such a manner that the widest is at the top and the second widest at the bottom of your tread band as shown in Fig. 2. Apply to the bottom or second widest ply a strip of fabric of proper width for breaker strip. This should not be quite as wide as the cut down. In adjusting the tread band to the case apply this side first. In making up the tread band care should be taken to roll each ply separately and remove all blisters by pricking them with an awl.

Retreading Cases

In retreading cases cut down to the fabric around the circumference of the case, from 2¼ inches to 3 inches above each bead, according to the size of the case. Remove the intervening tread from the fabric and skive or bevel the exposed edges of the gum. Buff them thoroughly on a wire buffing wheel. Insert a wire coil to hold case rigid and wash carefully with benzine or gasoline. Apply two coats of cement, allowing from 1½ hours to 2 hours for each coat to dry. Apply raw gum tread made up as described previously, pricking out all blisters with an awl. When this is done stretch a strip of wet muslin—cut at an angle of 45 degrees to the weave—over the tread lengthwise to serve as a surface liner. Over this apply the usual wrapper of wet muslin, drawing this as tight as possible, as shown in Fig. 1. Cure in a pot heater for 45 minutes at 35 pounds steam pressure.

It will be found that the operation of applying the new tread is one requiring considerable physical strength, especially in the wrapping operation. This should not be attempted unless qualified in this respect, as it is of utmost importance that the application should be firm and uniform.

Treating Rim-Cuts

Remove gum, including bead strip, from the side of the case for a space of from 1½ inches to 2 inches above the bead. Step down one ply of fabric all around, beginning about ½ inch from the exposed edge of the gum and extending down to the toe of the bead. Clean with benzine and apply two coats of cement, drying each 2 hours. Replace fabric stepped out and if the case is rim-cut through, extend the fabric around the bead and inside the case about one-half the circumference of its cross section. Over this put one ply of fabric to extend from bead to bead. Replace the bead strip with fabric. Fill

FIG. 2—BUILDING UP TREAD

in the gum removed with gum 3/32 inch thick and cure 45 minutes at 50 pounds steam pressure in a cavity vulcanizer.

Recovering Cases

Remove all the gum from bead to bead, also the bead strip. Buff the fabric lightly if necessary to completely remove the old friction. Wash well with benzine or gasoline and apply two coats of cement to the sides to a point from 2½ inches to 3 inches above the beads, according to size of case. Dry each coat 1½ hours to 2 hours and apply a strip of fabric from 2 to 3 inches wide around the sides as a bead strip, extending it down over the bead to the toe. Above the beads apply cushion gum 3/32 inch thick in a strip 2½ to 3½ inches wide—skive the upper edge. Cover remaining exposed fabric with one ply of 3/32 inch thick gum. Cure 30 minutes in cavity vulcanizer at 50 pounds steam pressure, after which apply raw built-up tread as described heretofore, or semi-cured band.

Repairing Inner Tubes

The edges of the cavity should be trimmed and washed out, the inside with benzine, as shown at A, Fig. 3. It is then coated with cement and allowed to dry for 2 hours, at which time a patch of repair sheet is inserted, first dipping it in benzine as a lubricant. This patch should be 1½ or 2 inches larger than the hole and cut square. The operation of inserting the patch is illustrated at B. The patch is folded and inserted with a pair of pliers. The cavity is then filled up with gum and presents the appearance indicated at C, after which it is cured from 15 to 20 minutes at 50 pounds steam pressure on a flat press.

Semi-Cured Retreading Bands

For applying semi-cured retreading bands, prepare the case as for raw-tread band, using cement. Carefully buff the retreading band, wash with benzine or gasoline and coat with cement twice, allowing 2 hours for each coat to dry. Apply to the band one ply of cushion gum 1/64 inch thick, and add a breaker strip of fabric. Then adjust the treading band to the case. It is well to use a layer of dry muslin under the band to prevent it sticking, pulling this out gradually as you adjust the band to the case. Proceed as before, but cure 30 minutes at 35 pounds steam pressure in pot heater. Omit, however, when wrapping, the wet surface liner which is used in connection with raw-gum treads.

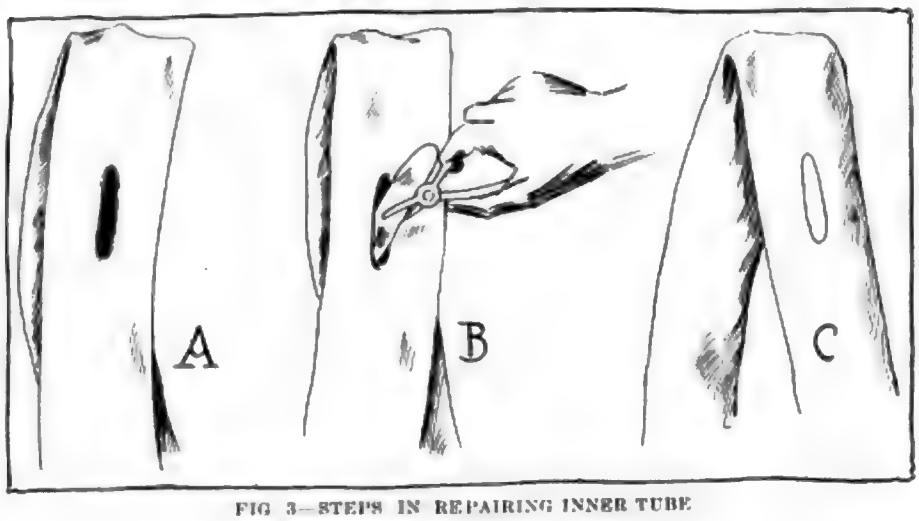
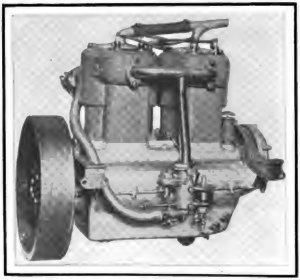


FIG. 3—STEPS IN REPAIRING INNER TUBE

1913 Moon Line Features Three Chassis

St. Louis Maker Continues This Season's Fours with Minor Changes and Brings Out Medium-Priced Six for 1913



INTAKE SIDE OF MOON 48 MOTOR FOR NEW YEAR

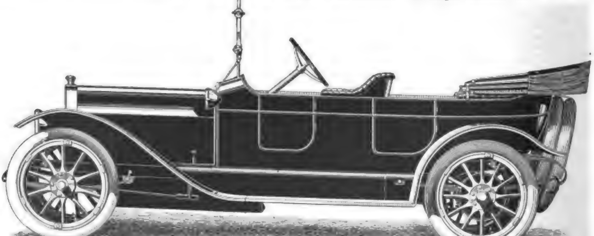
EXTENSIVE refinement and development has been made in the Moon line for the coming year. This year's models have been enlarged and improved, and a brand new six added. Most notable in changes for 1913 are the left-hand steer and center control, to be found in all the new models, the electric starting and lighting system and the substitution of a light pressed-steel torsion arm for the previous radius rods. The new models are model 39, which is a development of this season's 30; model 48, which is the outgrowth of the 1912 40, and the 65 six-cylinder car, which is the initial invasion of the six market by the St. Louis concern.

Model 39, so named for the brake horsepower claimed for it, is in general makeup a characteristic Moon product, embodying a T-head, four-cylinder long-stroke engine; a multiple-disk clutch; three-speed selective gearset, and a floating rear axle mounted on a 116-inch wheelbase. The cylinder dimensions of this model are 4 by 5¾ inches, bore and stroke; the ratio of 1:1.43 of bore to stroke being slightly greater than that of the 4½ by 5 motor of this year whose ratio is 1:1.11. The horsepower of next year's car by the modified S. A. E. rating is 39.2, while that of last year's motor, by the same formula, gives 43.2, each at 1,600 revolutions per minute.

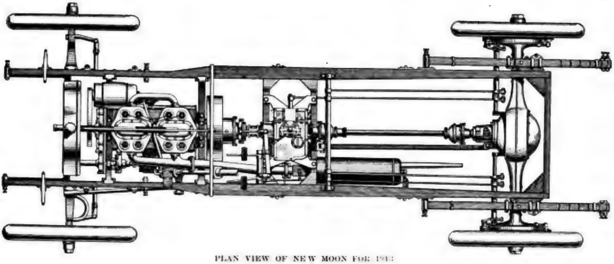
Model 48, whose claimed actual horsepower corresponds to its designation, is in general makeup the same as its smaller brother. The motor is identical in design except as to size with the 39, having a bore of 4½ inches by 5 inches stroke. The multiple-disk clutch sliding gearset, torsion system and rear axle are the same as the smaller model. It has a wheelbase of 121 inches.

Model 65, which is the new six, has a six-cylinder motor with cylinders 4 by 5¾ and is claimed to deliver 65 horsepower on the brake. The transmission system is of similar design to the four-cylinder model, but, is of heavier structure. The magneto on this model is of Bosch manufacture instead of Remy as on the smaller ones. The wheelbase of this model is 132 inches.

The most interesting feature of the new line is the electric starting and lighting system. This device is of special Moon design, built by the Wagner Electric Mfg. Co., of St. Louis. The outfit is in the form of a single unit, independent of ignition, and employs but one system of wiring, viz., a simple series plan. The motor-generator is mounted behind the clutch, and is chain-driven from the clutch shaft through a planetary gear, which affords the reductions of 2.7 to 1, direct, for generating, and 15 to 1 through the gears, in starting. The dynamo is multiple-wound and equipped with two commutators, one for use as a motor and the other as a generator. The brushes of these commutators are controlled for the change from generator to motor and vice versa by means of a lever, projecting from the generator base, which is linked to the planetary brake band lever, being controlled conjunctively by a starting pedal on the foot-board. The starting gearbox is mounted on the forward end of the armature shaft, being normally in direct drive, with the generator commutator brushes in action. It is locked so by means of three cams placed upon the planetary spider. In starting, these cams are released, the starting brushes brought into action and the band contracted, by the movement of the connecting levers, converting the machine from a generator, at a slight reduction, into a motor at a



MOON 65, A SIX-CYLINDER DEBUTANTE



PLAN VIEW OF NEW MOON FOR 1913

low reduction. Release of the starting pedal permits a spring to return these elements to their normal functions as generating units.

Mounted on top of the generator is an automatic circuit breaker, which serves to cut the generator into the battery circuit, upon its attaining sufficient speed to supply the battery, to cause the current to flow from the generator to the battery.

Two wires connect the cut-out to the battery, which is of six cells, with a voltage of 12 and a capacity of 50 ampere-hours. No cut-out is used to prevent overcharge, as the greatest output of the generator is low enough to render overcharge impossible, the maximum output being reached at medium speeds. At 18 miles per hour the generator delivers its full rating of 9 amperes, any increase of speed above this causing the output to decrease, so that constant driving at high speed will not generate sufficient current to damage the battery.

As a motor, the machine will crank the engine at approximately 70 revolutions per minute, producing a torque of about 150 foot-pounds per minute, sufficient to drive the car a short distance on high gear. The motor will continue to crank the engine as long as the starting pedal is depressed, the battery being of sufficient strength to turn it as long as ever may be required with an engine able to run at all.

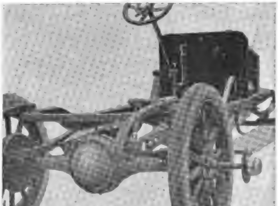
The lamps are connected to the battery on a three-wire circuit, a positive and negative wire leading to two separate lamp circuits, each being connected to a neutral wire, which is in turn connected to the center terminals of the battery. This produces two six-volt circuits, with but a single series of wires. The lamps are connected in parallel and controlled by a suitable switch.

In general design the Moon motor consists of a four-cycle T-head engine, the inlet valves located on the right side and the exhaust on the left, being actuated by separate camshafts. The valves are of large diameter, being 2 inches inside with a comparatively short lift. The valve tappets are of the roller type and are lubricated from the splash in the crankcase and are adjustable for wear. The new models are notable in that the valves are inclosed by aluminum covers to eliminate noise. The camshafts are driven by spiral gears. The cams and the shafts are cut integral and run on phosphor bronze bearings. The pistons are of gray iron fitted with four rings at the top and a number of oil grooves at the bottom. The pistons are unusually long and the wrist pins are set near the top, thereby permitting long connecting rods, decreasing the angularity of thrust and in conjunction with the long pistons lessening the wear on these parts. The crankshaft is of 1¾-inch diameter and is carried on three bearings of 11¼ inches total length of the four-cylinder models. The flywheel is bolted to an integral flange on the crankshaft. This element is cast with fan vanes. Water circulation is by a centrifugal pump in connection with a honeycomb radiator. Lubrication is by means of a constant-level circulating splash system, circulation being maintained by a rotary pump driven by spiral gears from the exhaust camshaft. This system has a capacity of 2 gallons.

A special Stromberg single-jet, water-jacketed carbureter, gravity fed, is used and the ignition is by dual system, using a battery independent of the lighting and starting system. The cylinders are cast in pairs and are bolted to a crankcase divided into upper and lower halves in the conventional manner. The motor is supported at four points from the main frame by cast arms, bolted to the top of the crankcase.

The clutch is of the multiple-disk-in-oil type, steel against steel, mounted on plain bearings with ball thrust, inclosed in the flywheel. The gearset is located amidships and is supported on four points by integral arms from two cross members of the frame. The shafts are supported on heavy annular ball bearings, a double row supporting the forward end of the main shaft. The case is of aluminum, the control quadrant being mounted directly upon it.

The drive is through a propeller shaft with two universal joints. The rear axle is of exclusive Moon design. The housing and axle tubes are of one piece and carry the annular roller wheel bearings. The



THREE-QUARTER REAR VIEW OF MOON 48 CHASSIS

Koecklin Is a New Two-Cycle Engine

Two-Stroke Motor With Sleeve Valves Designed for Racing

FIG. 1—DETAILS OF SLEEVE VALVE TWO-CYCLE MOTOR

TO overcome the main objections brought against the two-cycle type of motor, namely the mixing of the fresh with the spent gases and the consequent inability to run correctly at a low number of revolutions, Alfred G. Koecklin, a European manufacturer, has produced a new type of two-cycle motor with sleeve valves. In this case the sleeve is not an independent organ but an extension of the piston. It is shown in Fig. 1, P being the complete piston and sleeve; S the sleeve forming a tubular extension of the piston; I the intake ports, and E the exhaust ports. The cylinder is of the superimposed type; the lower portion, P 1, having a greater diameter than the upper portion, and operating in the pump chamber P C, aspires and compresses the charge for an adjoining cylinder instead of its own cylinder.

This motor has been designed for racing purposes, its detailed construction differing in several respects from what would be adopted for a commercial article. It will be noticed that the gas pump chamber is not cast with the cylinders, but is a separate chamber secured between the cylinders and the crankchamber and descending into this latter. The cylinders have a special type of detachable head, D H in Fig. 1, descending a considerable distance into the cylinder and secured to this latter by means of a series of bolts. This detachable head has an internal waterjacket and is bored out centrally to receive the spark plug.

As will be readily seen, this descending head forms an annular chamber within which the tubular sleeve operates, the sleeve thus being in contact, on the one hand, with the water-cooled cylinder walls, and on the other with the water-cooled cylinder head. Compression rings are fitted at the base of the head, at the base of the sleeve just above the intake ports and on the piston just below the head; there are also the usual rings on the compressor. In the illustration none of these rings is shown, but the single grooves will be observed, and it is in these that double spiral rings are fitted.

Near the end of the firing stroke the series of ports at the head of the sleeve register with the exhaust ports in the cylinder walls, and the lower ports uncover the intakes, allowing the compressed charge to rush in at the base of the sleeve and drive the spent gases out at the head. The ports being respectively at the base and the head of the cylinder, no baffle plate is required, it being claimed by the inventor that there is a complete scavenging of the cylinder and no loss of fresh gases. A further advantage of the system is that intake and exhaust take place on different planes and around the complete circumference of the cylinder, thus avoiding the warping effect sometimes met with

differential is of the double-gear type and runs on roller bearings, supplemented by ball thrust bearings. The axle shafts may be removed from the axle assembly by unscrewing six nuts on the wheel hubs and pulling out the hub caps and shafts which are integral. This operation, as shown in the accompanying illustration, permits the differential to be removed as a unit, by taking off the large plate at the rear of the axle housing.

Brakes on all models are 16 inches in diameter with 2¼-inch face. Oil drains prevent any grease from getting on the drums. All brakes are adjustable. They are equalized by cross trees and are of the internal expanding and external contracting type, lined with Raybestos. The frame is of channel steel, extra heavy at the center, narrowed forward of the dash and heavily gusseted. There is a kick-up over the rear axle, the three-fourths scroll elliptic rear springs being secured thereto. The front springs are of the conventional half-elliptic type, perched over the axle.

The front axle is I-beam section made in one piece. The steering arm is carried above, and the tie rod behind it. The front wheels run on roller bearings.

Body types for 1913 include touring cars, roadsters, colonial coupes, limousines and berline limousines on all models, and special bodies for special purposes, such as light delivery, ambulances, etc.

Manufacturers' Communications

AS TO CARE OF TIRES

AKRON, O.—Editor Motor Age—A tire is one of, if not the most, important feature of a motor car. It is built for service. The service, as you may know, is not forthcoming if the tires are not treated with a reasonable amount of consideration. The men who get their money's worth and more out of their tires are those who detect an incipient trouble and remedy it at once.

Brought Out by a European Designer

Separate Pump Chamber Provided for Compressing Gases Before Ignition

in sleeves having intake and exhaust on the same horizontal plane.

A H-section rotary distributor allows of the passage of the gas from the compressor of one cylinder to the combustion chamber of the neighboring one. This distributor is shown at D, Fig. 2, where it is lying at the base of the block of four cylinders and just below the distributor chamber within which it works. This chamber, common to two cylinders, is completely waterjacketed to prevent condensation of gasoline on the walls. The distributor is driven by means of a silent type of chain from the crankshaft. It is in two distinct parts, coupled by means of dog teeth and has a pinion in the center driving the vertical spindle operating the oil pump.

In this illustration of the cylinders the detachable head of cylinder and connected up to the right-hand one. The intake are cut on the outer circumference of the tubular head, in order to facilitate the distribution of oil, the lubricant being brought up to holes O L receiving the oil leads; there is a similar oil delivery on the opposite side of each cylinder.

The crankshaft, C S in Fig. 3, is carried on five S. K. F. ball bearings, there being a bearing between each throw, one at the front and one at each side of the distributor pinion at the rear of the shaft. For the purpose of lubrication the shaft is bored throughout, the oil being drawn from the base chamber, through the hollow shaft to the connecting rod ends, and up the tubular connecting rods to the wrist pins. In addition to this there are, as already mentioned, a couple of oil deliveries to opposite sides of the head of the sleeve, and six leads to the rotary distributor

On the forward end of the crankshaft is a bevel pinion driving a transverse shaft with a Bosch high-tension magneto at each end. Intake and exhaust taking place entirely around the cylinder, there are a pair of exhaust manifolds, to the left and right of the motor, the left-hand side one passing behind the rear cylinder and conected up to the right-hand one. The intake manifold is cast with the cylinders, the carbureter, a Vapor, being bolted up direct without the use of any piping.

So far as chassis features are concerned, the car is on standard lines. The clutch is of the cone type; the gearset provides four speeds and reverse, with the lever mounted directly on the box, and being operated by the left hand. The car is shaft-driven, with a universal at each end, has a floating type of live axle, and no differential. The frame, which has its greatest depth opposite the flywheel, is inswept at the front axle and outswept again at the extreme front. It is sharply upswept over the rear axle. The chassis has neither distance nor torsion rods to take up torsional stresses.

FIG. 2 NEW KOECKLIN TWO-CYCLE RACER

The greatest source of tire trouble is under-inflation. A motorist will run his car for miles on tires that are not properly inflated; due perhaps to the fact that they ride somewhat easier, and then wonder why his tires that were guaranteed to give service are out of running condition.

We are trying to educate the users to care for tires in a manner that will bring long life and reduce repair bills to a minimum. The one who would follow these instructions should begin by supplying himself with a reliable air gauge; and then use it to keep his tires inflated at the prescribed pressure—20 pounds per inch of the cross section. For instance, if a tire is 4 inches, then the pressure of air should be 80 pounds.

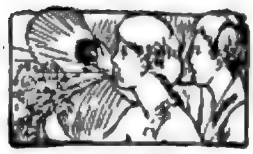
Another thing the man who wants to save expenses should bear in mind is the fact that 5 per cent added to the weight of a car usually subtracts 15 per cent from the life of the tires. As long as the car owner can with smiling countenance pack eight or nine people in his seven-passenger machine, he must accept the consequences.

In order to get all the pleasure there is to be had from motoring and also to save expenses in the long run, the owner should find out the weight of his car, weights certain sized tires are able to carry.

There are still other motorists who seem to have the greatest trouble with their treads wearing out. Undoubtedly they can be numbered among those men who, ignorant perhaps of the detriment it is to their tires, bring their car to a standstill so suddenly that it would really be a miracle if the tread didn't wear off long before its allotted time.

Be sure your brakes are properly adjusted; if not, they throw all strain of stopping on one tire, and this, as every one knows,' spells ruin.—B. J. Cox, chief adjuster, Goodyear Tire and Rubber Co.

From the Four Winds



ANOTHER A. A. A. Recruit—A motor club was organized in Delhi, N. Y., last week and was immediately affiliated with the New York State Automobile Association.

State Meeting Called—Officials of the New York State Automobile Association have decided to hold their annual state convention this year in Utica, N. Y., during the first week in December. Decision was reached on Saturday.

Mexico to Build Roads—Jesus Flores Magon, minister of the department of gobernacion of the federal government, has appointed Alberto Pani to the position of director of public works. Upon Mr. Pani will directly devolve the duties of carrying out the plans for the government for establishing an extensive system of highways throughout the republic.

Mexico Adopts Good Idea—The Mexican government has adopted the French system of keeping the public highways in repair. Road overseers will be appointed for each public road and each man will be given charge of about 1 mile of road to inspect and keep in repair. The first highway to which the system will be applied is the one running between the capital and Puebla.

Motor Cars in Mexico—"There are fifty or seventy-five motor cars in Tampico and vicinity," says the American consul there, "and most of these are second-hand cars purchased in the United States or in Mexico City. There are about twenty-five cars in that city being used as taxicabs. The demand is for small, cheap cars costing about $1,200. Because of the sandy condition of the roads, the country is not adapted to the use of the motor car, although there are about 80 blocks of asphalt pavement in Tampico. There are no repair shops and no agencies in the city. A road between Tamipco and La Barra is being considered."

Cincinnati Grows Enthusiastic—Cincinnati is soon to have a floral parade, which in point of beauty will compare with the brilliant, dazzling event in Los Angeles each year which is known as the fiesta or feast of flowers, if plans laid before a meeting of the Cincinnati Commercial Association by its president, George F. Dieterle, are adopted. The proposed plans grow out of the success of the sociability run of last Saturday in which the Cincinnati Commercial Association and the Commercial Tribune were the leading lights. So enthusiastic are the contestants who took part in the run on last Saturday and likewise the people who had the affair in charge, in which fifty-five different makes represented in 175 cars took part, that nothing short of a parade of decorated motor cars will suffice to satisfy them. One of Mr. Dieterle's plans for the proposed parade is that there should be 500 cars in line.

Baker Middleburg President—James L. Baker was elected president of the Middleburg Automobile Club, recently organized in New York state. Other officers elected include: Vice-president, Dr. C. S. Best; secretary, Roger W. Cornell; treasurer, William J. Pindar.

Car Runs a Press—While scores of other industries were tied up by the lack of power, due to floods and high water in Wisconsin, the Wausau Record-Herald for 2 days recently was able to issue regularly, and it was by means of motor car power that the trick was turned. I. L. Seery, district agent for the Dahl Punctureless Tire Co. at Wausau, offered the use of his Chalmers 36 to J. L. Sturtevant, editor of the Record-Herald, and by belting the rear wheels to the printing press pulleys, more than enough power was generated to turn the perfecting press and run off the daily editions without any trouble whatsoever.

New Way to Clean Streets—With a regard for the comfort and safety of the city traffic of Los Angeles, the officers of the Automobile Club of Southern California have worked out a quicker and more efficient plan than the one now employed for cleaning the city street. The plan involves cleaning the streets by means of air tanks fastened to the street cars. The cleaning of the streets could then be quickly and effectually done during the hours of 2 and 4 a. m. Motorists who have had trouble and accidents caused by tire skidding while the streets were being flooded under the present system are watching the outcome of the safer plan with much interest.

Chance in Great Britain—According to a recent report from Consul Albert Halstead, Birmingham, Eng., there is a great field in Great Britain for the development of the American rubber tire industry, as it is claimed there is "more actual rubber in the American article than there is in the British or European product," rubber substitutes and fillers being extensively used in the foreign tires. Success, though it may be slow, will surely come to the American tire manufacturer in England and on the continent, if the tires are as good as they are said to be, says the consul, but, in order to bring about this successful financial condition, the American maker first must understand that it means the use of good material only and much money expended in the way of advertising, contesting in racing events, etc., and following to a certain extent the British policy with "such modifications as American sales ingenuity may deem desirable." This scheme, it is thought, will produce results.

On a Long Trip—After a trip of 10,863 miles, which took him practically around the United States, E. M. Pierce, of New York city, reached Indianapolis on September 25. Pierce is a lumber dealer and has his office in the Pathfinder in which he made the trip. Leaving the east he went to Chicago, then through Canada and down along the Pacific coast, returning by way of the southwest to the city of Indianapolis.

Abolishing Toll Roads—With the purchase of a toll road by the Floyd county, Indiana, commissioners, but one other toll road remains in that state. The road just purchased is 13⅓ miles long and has been operated as a toll road for 75 years. It runs from New Albany towards Paoli. Henceforth it will be a free road. The remaining toll road runs from New Albany to the Harrison County line. The road just bought was purchased for $1,000 a mile, bonds being issued payable in from 1 to 5 years.

Road Improvement in Michigan—The movement for better highways is booming in Michigan at present. November 5 Marlette township, Sanilac county, will vote on a proposition to bond for good roads. Trout Lake township, Chippewa county, has voted to bond for $10,000 for better highways. Mackinac county will vote November 5 on a proposition to bond for $5,000 for the same purpose and in the counties where bonds have been issued and work of improving roads and building new ones is going on at a pace that surprises everyone.

Too Many Signs—The Motor Club of Harrisburg, Pa., will shortly take up the question of having certain signs along different highways eliminated. In the opinion of many there are too many signs in some sections. Once upon a time the trouble was there were not enough such signs Now they say the multiplication and duplication is confusing, particularly so when there is a popular turn that has a whole forest of posts growing upon it. The touring motorist finds so many versions of the distances to be traveled and of the names of the towns nearby that he may be excused for being puzzled. In some cases signboards have too much on them. They attempt to tell too much about the countryside and the letters and numerals are cramped so they can be read only by a person who must come to a full stop and often must dismount to get close enough to see. Then again there are sign posts made of metal, which do not in every

case survive the weather and the stone-throwing as they should. Such sign posts are often signs of nothing, or else are barely decipherable.

Can Put Up Colored Bands—The New York state public service commission has declared that it has no objection to the placing of colored bands by the New York State Automobile Association on poles throughout the state of public service corporations so long as they will not interfere with the stencil marks of the poles which show ownership as required by order of the commission. The reply was in answer to Secretary Lyon's request for information for the state association.

Example of Road Enthusiasm—Three miles of highway leading into Clintonville, Wis., from the west, were built in 1 day by an organization of public-spirited citizens of all walks of life. Some furnished money, others contributed materials, while others threw off their coats and did the work. There were hauled to the road and spread 290 loads of gravel and crushed stone and the 3-mile stretch was turned from a sandhill into a splendid road between 7 o'clock a. m. and 7 o'clock p. m. by the enthusiastic citizens.

New Empire State Road Opened—The New York state highway commission last week opened for traffic of motorists the Buffalo-Batavia road through Williamsville and Clarence, N. Y. For the past 6 weeks 2 miles of this highway east of the Transit road had been closed while brick was being laid. During that time motorists had to detour from the main road by way of Clarence Center. The highway department insisted that the road could not be opened until stretches of earth beside the 16 feet of brick roadway was finished but the urgency of Secretary Lewis of the Automobile Club of Buffalo undoubtedly had the right effect. Lewis claimed the highway commission was seeking retaliation for the stinging rebuke issued by the club a few weeks ago for its alleged negligence in good roads work in the Empire state.

German Motor Car Insurance—Daily Consular Reports recently devoted several pages to the subject of motor car and air craft insurance, saying in part that twelve insurance companies represented in Berlin write motor car insurance. Different forms of policies used cover the owner's liability for damage to persons or property, insurance of passengers, the motor car, tires, baggage and the chauffeur, also safe transportation of the car. German insurance policies are generally valid only in continental Europe. Premiums are based on the taxable horsepower. The maximum liability for damage to property is $2,380; damage to one person, $11,900; and the maximum limit of liability of all kinds for any one accident is $35,700. New motor cars are insurable at a somewhat reduced rate, and club rates of premiums may be secured. In case of accident to a car carrying more passengers than provided for in the policy, the liability for each passenger decreases in proportion as the number of passengers actually in the car is greater than the number provided for in the policy.

Ontario's Motor Revenue—Ontario's revenue last year from the sale of licenses for motor vehicles totaled $50,831.25, twice the amount received during the year 1910, which was $24,394. The revenue for 1906, the first year fees were imposed, was only $15,235.15. The licenses issued last year totaled 11,339, and for 1910, 4,230, while in 1906, 1,176 licenses were issued. Fees collected for issuing charters to motor car corporations totaled $235,663,10.

Cannot Stop Garage Building—Corporation Counsel Hammond, of Buffalo, N. Y., has sent a legal communication to Commissioner of Public Works Ward to the effect that persons desiring to erect garages are not required to secure consent of adjacent property owners prior to construction of the buildings for the accommodations of motor vehicles. The ruling was the result of the case of the Adams Express Co., which is planning to construct a garage in vicinity of Swan, South Cedar and Chicago streets and in which property owners complained. Judge Hammond added that the ordinance states that property owners shall have opportunity to be heard on such cases before an aldermanic committee so that their views of the matter may be ascertained, but they cannot prevent erection of garages.

Wisconsin Garage Law

THE first uniform set of rules for garages has been issued by the state fire marshal's department of Wisconsin, and beginning October 1, all garages in Wisconsin will be required to observe closely the regulations made by state authority and given to the chiefs of the fire departments in the various cities and villages for execution. The list of rules is the result of a thorough investigation of garage conflagrations, and it is expected that the rules, if observed, will eliminate the most serious evils and menaces. The rules, thirteen in number, are as follows:

1.—None but fireproof buildings should be used as a garage; never any building, part of which is used for public meetings.

2.—The floors should be of cement.

3.—Heat with steam. Allow no flame, fire or fire heat, stove, boiler, furnace, forge or torch in the garage.

4.—Use electric, incandescent lights, protected by wire basket guard; never use lamps, candles, lanterns or other open lights.

5.—Store all gasolines in an approved underground tank, equipped with standard pump. Never keep gasoline in open vessels, or allow gasoline to run or drip on the floor or into drainage system.

6.—Use approved safety cans or approved portable tank in transferring gasoline to cars.

7.—Make sure that gasoline tank in the car is free from leaks and that the caps are secure.

8.—Provide standard metal waste cans on each floor, especially near the work bench, for oily waste. Destroy this waste each evening.

9.—Allow no shavings, refuse or waste to accumulate.

10.—For private fire protection, keep pails of sand with scoop and approved chemical fire extinguishers on each floor.

11.—Beware of carbureter flooding.

12. Absolutely permit no smoking in the garage.

13.—Always be careful and vigilant.

Large placards have been prepared at the cost of the state and given to all fire chiefs for distribution to garages. One copy of the placard has also been mailed to each garage, so that there may be no omissions.

Ask for Convict Labor—Governor Hunt, of Arizona, has been petitioned by many of the tax-payers of Globe and the Gila river valley to have state penitentiary convicts build the 6 miles of uncompleted road between Stanley and Aravaiba on the edge of the Crook Nation forest in Graham county. It is stated that if this 6-mile stretch of road is built it will reduce the road mileage between the national forest district and the nearest railroad point 40 miles.

New York's Car Holdings—Fourteen motor cars are now owned by the New York state government, being divided in the various state departments as follows: State highway department, 8; state engineer's department, 3; department of public works, 2; state excise department, 1; the cost of each being between $3,000 and $6,000. When a state official secures a car he immediately receives with the governor's approval a chauffeur of his own choice who is placed in the non-competitive class in the civil service. These chauffeurs receive salaries ranging from $100 to $125 a month.

To Concrete King Edward Road—A portion of the King Edward highway is to be built of concrete, the contract for its construction having been let in the province of Quebec. The King Edward highway is the Canadian section of the International highway, connecting Montreal with several large cities of the United States. Ultimately it is expected that this road will continue as far south as Miami, Fla. It was the original intention that the entire highway should be built of macadam; but the minister who has under his jurisdiction the Canadian branch of the work has become interested in concrete roadways and has decided upon this important undertaking as a good place to try it out.

Texas Wants Registrations—An effort will be made in the Texas legislature, which convenes in January, to enact a law requiring the registration of all motor cars. Most of the towns and cities already have ordinances in effect providing for the registration and licensing of motor cars, but the new law will provide for a state registration. At this time there is no authentic means of knowing how many motor cars are in use in Texas. The number has been estimated all the way from 25,000 to 50,000. These estimates are based largely on the reports of dealers over the state. In San Antonio up to September 15 there had been issued a total of 2,398 licenses for motor cars. In Houston, Dallas and Fort Worth the number of cars in each of those cities exceeds the San Antonio registration, it is claimed.

The Realm of The Commercial Car

Time Wasted at Delivery Platforms

Examples Cited of Way Motor Trucks Are Handicapped

By William B. Stout

THE delay of motor trucks at congested delivery platforms is a serious proposition. It costs more to keep the trucks waiting than horse vehicles and yet is there any system or way in which a motor truck can be given preference without working hardship to the drivers of the horse vehicles waiting in line?

There was a world of truth in the remark recently made by the young Polish driver of a 3½-ton truck for the J. T. McMillan Packing Co., of St. Paul, Minn., when he was hindered at the freight depot platform. The firm had very strongly impressed upon his mind the necessity of keeping up the service at these points and eliminating every idle moment possible in the use of the vehicle. Arriving at the platform and finding a number of teams ahead of him the driver became nervous and rather free with his language in connection with delay which seemed to him entirely avoidable. "Aw, hold your horses," said the man ahead, to which the driver very quickly retorted, "We ain't got no horses; we're a motor truck. Hurry up!"

Few cities have adequate room and facilities in their railway freight yards for handling the traffic which passes through. In almost any city one can find lines of from five to twenty vehicles lined up awaiting their turn at some platform where a great deal of time is being wasted and little effort being spent toward attaining real results. This very fact in most cities is the direct reason why motor trucks cannot be made to pay in services operating from railway yards, in cities where the haul from these yards is short, hindering the successful use of the truck entirely.

Chicago is peculiarly situated from a railway standpoint, and practically all of the central portion of the city can be reached by a wagon haul of not over a mile and a half. The average length of time which a vehicle is required to wait at a receiving or delivering platform in these yards is close to 1 hour. For short hauls a motor truck can only be made to pay through quick loading facilities and devices. Horses therefore can often do the work in Chicago serving these points at one-half the cost of motor truck

Army Officer Discusses Motor Truck Work

FORT MEADE, S. D.—Editor Motor Age—I have read with great interest the article on the New England maneuvers, published in Motor Age, issue of August 22, which gives an excellent account of the part played by trucks in these maneuvers. Your correspondent mentions one case where a 1½-ton truck was able to accompany the troops actually into their camp and he added that this was exceptional as every where else the motor trucks had to be unloaded at the entrance to camp or else could not be taken into the field for anything but a short distance.

This is just the point to be overcome in developing a motor truck for army use. We can use ordinary types of commercial trucks for hauling army supplies over good roads, but in campaigning we are not at liberty to select our line of communications with a view to having good roads, so it is necessary to develop a truck which will be able to negotiate any condition of territory which can be operated over by mules and wagons. From my experience with trucks, I believe this to be entirely feasible.

For comparison of trucks with mule-drawn wagons as a means of transportation in the field trains, it is necessary to consider a truck moving at the same rate of speed as a wagon, as each necessarily follows a column of troops and under the peculiar conditions it would be impossible for the truck to make two trips or more and it must be able to follow the troops anywhere so as to deliver rations wherever they camp for the night. Even under these conditions, the use of motor trucks will be economical.

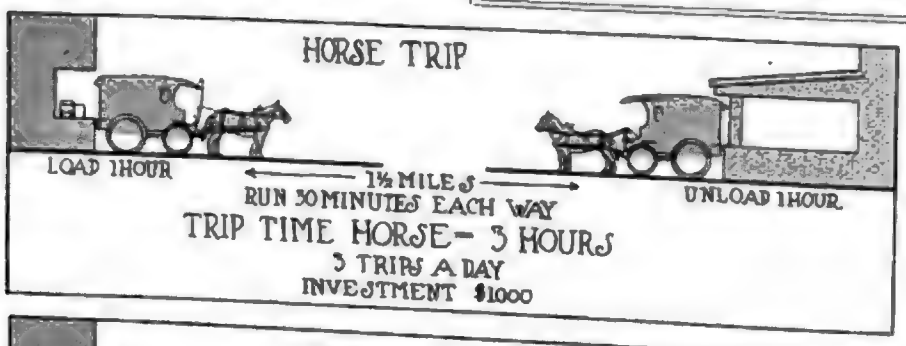
My views coincide with those of the writer as to tires. While I have found no type of pneumatic or filled tire which is sufficiently durable for rough work required of an army truck, still they are far from efficient—while they last—as they not only cause less vibration but give far better traction in mud, sand and on rough roads than do the solid tires, either smooth or with block tread.

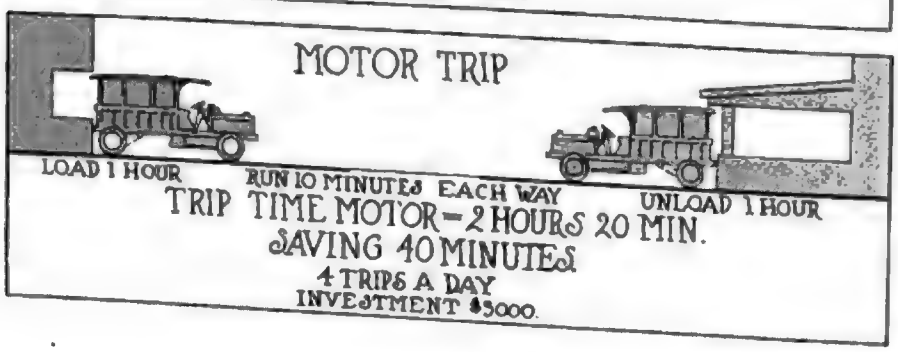
I believe that the motor ambulance for army use should have the same chassis as the truck, the body being the only difference between the ambulance and the motor wagon.

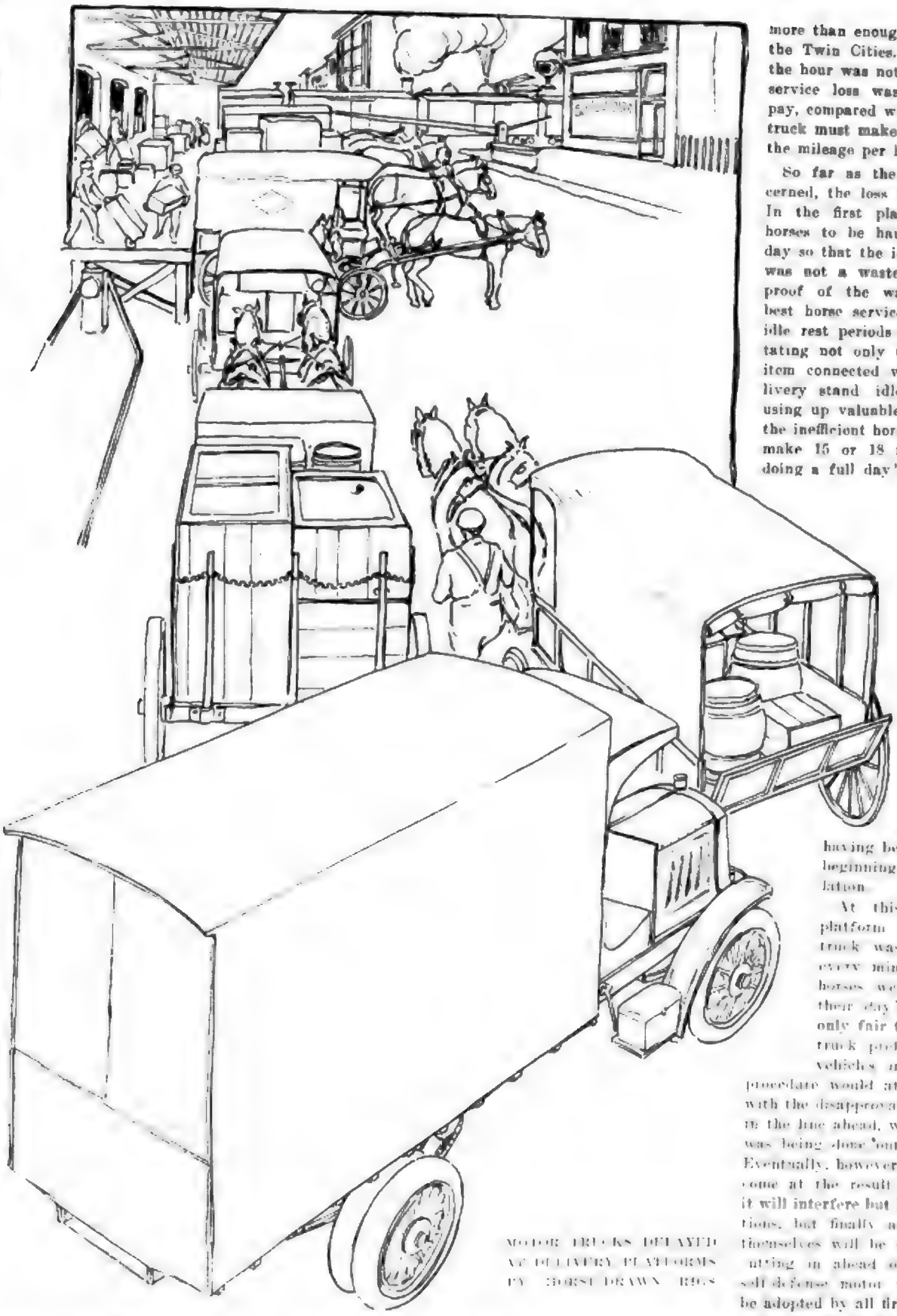
My experience has been that the 1½-ton truck is the largest that can be depended upon under all conditions of roads. I tried out six 3-ton trucks of the best types made in the United States and they failed utterly on ordinary country roads in Wisconsin, where the 1½-ton trucks carried their loads with little difficulty.

Under the head army mule equipment, the following is stated: "The capacity of the mule wagon is 3,000 pounds and it cannot stand much, if any, overload." This has not been my experience. Just a few days since, a wagon train left Fort Meade, S. D., with a cavalry command and I weighed the wagons as they pulled out. The loads varied from 3,400 pounds, the lightest, to 5,400 pounds, the heaviest, and the train proceeded through the Black hills of South Dakota, over dirt roads the first day, and then the loads were reduced to normal.

The summing up in the article is good. I think, however, that the average wagon will not have a capacity of more than 3,000 pounds.—Alexander E. Williams, captain, United States army.







MOTOR TRUCKS DELAYED AT DELIVERY PLATFORMS BY HORSE DRAWN RIGS

service, places allowing the use of motor trucks at all to these yards being exceptional ones involving a long haul.

At a Minneapolis out freight platform recently eight horse vehicles were noted standing in line ahead of a motor truck which was forced to await its turn with the rest. The truck was a 3-ton machine costing possibly $12 per day to operate. To await its turn at this platform an hour's time at least would be lost, a loss of 15 miles of service under full load, more than enough to make a trip between the Twin Cities. The mere cost loss for the hour was not more than $1.25 but the service loss was much greater since to pay, compared with horse service, a motor truck must make from two to three times the mileage per hour of a horse vehicle.

So far as the horse vehicles are concerned, the loss was comparatively small. In the first place it is impossible for horses to be hauling every hour of the day so that the idle time at this platform was not a waste but a rest period. A proof of the wastefulness of the very best horse service is that there must be idle rest periods during the day, necessitating not only that the man but every item connected with the business of delivery stand idle waiting, loafing and using up valuable time at the demand of the inefficient horse. So long as the teams make 15 or 18 miles per day they are doing a full day's work and this mileage can be accomplished in 3 to 4 hours of actual road work. Since the horses must stand still the rest of the time they might just as well be idle at the delivery platform as in the barn or any other place.

With the motor truck, however, no rest periods are demanded. Every minute of road running lost is lost service. All of these statements are axiomatic, having been recognized from the beginning of motor truck installation.

At this Minneapolis freight platform therefore the motor truck was suffering a loss for every minute of idle time; the horses were resting—a part of their day's work. It would be only fair then to give the motor truck preference over all horse vehicles in unloading. Such a procedure would at once, however, meet with the disapproval of every other driver in the line ahead, who would feel that he was being shut out of his rightful turn. Eventually, however, such a condition will come at the result of demand. At first it will interfere but little with horse operations, but finally as a result the horses themselves will be so hindered by trucks getting in ahead of them that in very self defense motor vehicles will have to be adopted by all firms delivering to these points to get to the delivery platform at all.

When this time comes there will come with it an entire reorganization of the methods of handling goods at in and out freight stations. The half-hearted methods which were plenty fast enough for horse

delivery will give place to fast systematized handling of goods which will make for few delays and short stops.

Making its beginnings at those points of least resistance motor delivery has more than made good, not only in service but in the matter of cost, meaning money saved. In other lines not so well fitted for truck use machines are successfully operated not because of less cost but because of better service. More trucks are being used in this class every day and every machine put into operation under this condition tends to clean up and hurry up hindering factors which keep it from being a financial paying proposition at the present stage of its work. This will mean that very soon these trucks will be paying financially as well as in service and will have better delivery conditions to a degree that will allow other lines of work to take up the motor from the service standpoint which could not do so now with any degree of success.

Thus will gradually come an era of reorganization in all freight handling matters as related to the delivery of goods over the road, and just as surely as the motor car has driven the horse off of the boulevard so will the motor truck eliminate all draft animals from our business streets.

The inefficiency of the horse has long been known; the efficiency of the truck has now been proved beyond question. Those who do not know this are becoming posted.

Urban Commercial Electric Car

FOR 1913, Urban electric wagons are built in four capacities. These sizes are: model 10, a light delivery wagon of 1000 pounds capacity; model 20, for heavier work and light trucking, which is of 1-ton capacity; model 40, a 2-ton size, and model 70, the heaviest, of 3½ tons capacity. The manufacturing policy of the Kentucky Wagon Mfg. Co., the maker, is conservative, as shown in the design, but details are carried out with considerable refinement. All four models are built on the same general plan, details of construction differing principally in sizes.

CHASSIS OF 1913 URBAN COMMERCIAL ELECTRIC

Urban trucks are double chain-driven, with underhung batteries, the driver being seated at the forward end of the chassis. The motors are suspended beneath the main frame, behind the battery compartment, and drive to a countershaft. Batteries are of 165 ampere-hour capacity on the 1,000-pound size, 165 on the 1-ton model, 195 on the 2-ton, and 252 on the 3½-ton truck. The wheelbases and tire sizes on the different types are, respectively, 36 by 2½ front by 36 by 3 rear on the model 10; 36 by 3½ front by 36 by 4 rear on the model 20; 36 by 4 by 36 by 3 dual rear on the model 40, and 36 by 5 front by 36 by 4 dual rear tires on the model 70.

The small car carries thirty cells, while the others have forty-four each. They are geared respectively for 12 miles per hour, 10 miles per hour, 9 miles per hour, and miles per hour with full load. The wheelbases are 86 inches, 100 inches, 118 inches and 130 inches respectively on the four models.

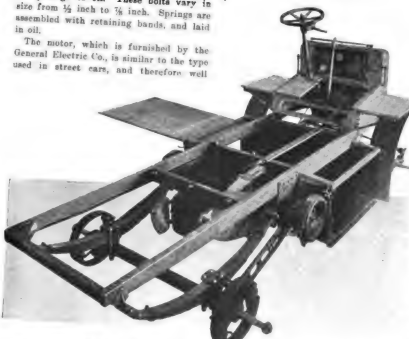
SIDE VIEW OF URBAN ELECTRIC CHASSIS

The cars are built on frames of pressed channel steel, in depths of from 3 to 7 inches, a sub-frame, by which the battery and motor are supported, being suspended from the frame by an ingenious system of trussing. Each frame has five cross members, three of which are attached to the side members by integral gusset plates, the other being without gusset plates, and serving to support the sub-frame from the main frame. Frame dimensions, rivet spacing, etc., follow closely the recommendations of the S. A. E. standards committee.

The axles are of I-beam section in front in all models, I-beam rear on model 10, and of square section in the rear axles of the heavier models. They are all steel forgings, the spindles being of large size and mounted with Timken roller bearings. Wheels are of the artillery type, with plain solid rubber tires. Urban springs are mounted on the axles by special heat-treated nickel bolts of large diameter, which are secured to the springs by rigid steel plates mounted over the spring centers. Springs are half-elliptic all around, 56 inches long by 3½ inches wide in the rear on the heavier models. All spring eyes are bronze-bushed, and spring shackle bolts are hardened and ground, being lubricated by integral grease cups, with holes drilled through them to facilitate

the passage of oil. These bolts vary in size from ½ inch to ⅞ inch. Springs are assembled with retaining bands, and laid in oil.

The motor, which is furnished by the General Electric Co., is similar to the type used in street cars, and therefore well adapted to commercial vehicle service, the rigors of whose demands for overload and flexibility may well be compared to the strenuous service for which this type was designed. It is designed, too, with special regard to efficiency in storage battery service. The motors for the different models are made in capacities of from 60 volts, 20 amperes, to 85 volts, 40 amperes.



THREE-QUARTER VIEW OF URBAN TRUCK CHASSIS, SHOWING SLIDING BATTERY BOX AND PROTECTED DASH FITTINGS

Drive from the motor is to a countershaft by means of a silent chain, the driven sprocket being mounted on the flange of the differential gear, and the whole assembly inclosed in an oil-tight aluminum case, and running in a bath of oil. The differential is of 3½ per cent nickel steel, heat-treated, the gears mounted on ground bearings, provided with oil passages.

The countershaft is mounted on four annular ball bearings, and drives to the rear wheels by adjustable roller chains. The rear sprockets are mounted on the brake drums, which in turn are bolted to the spokes of the wheels. Propulsion is through radius rods, which are so pivoted as to allow universal movement of the axle, without undue stress on the frame.

Options on the battery are offered for either lead or nickel-iron types, the former type being offered in either standard, medium, thin, or ironclad plate construction. The battery is suspended from the sub-frame, just before the countershaft, where it is well protected, and accessible from either side and from the top, the cells being disposed in trays that may be withdrawn from either side.

The controller is mounted in the short dash shroud, together with ampere-hour meters, lighting and emergency switches, and all wiring terminals. This compartment is accessible by the removal of a rear panel of aluminum. The switches are mounted on the wood casement of the panel, and are accessible from the driver's seat. The emergency switch is fitted with a key which can only be removed when it is in off position. The controller is operated by means of a lever just beneath the steering wheel. This lever is disposed within a double slot segment, the lower slot being for the four forward speeds, and the upper for the two reverse speeds, a thumb latch between preventing accidental passage from one slot to the other. This controller handle revolves the outer tube of the steering column, which is linked to the controller by a drag-link mechanism.

Service brakes, which are of the contracting type operate on drums on the counter shaft, and are actuated by a pedal; emergency brakes, being in the rear wheels, and of the expanding type, and are controlled by a side lever. Steering is by a worm and nut steering gear.

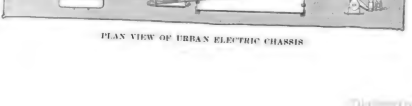
Owing to the position of all essential parts below the main frame, the body space behind the driver's seat is clear, adapting the chassis to any style of special body, and making loading and unloading easy.

MICHIGAN MILITIA TRY TRUCKS

At the recent maneuvers of the Michigan National Guard at Ludington, Mich., motor trucks were very much in evidence for the first few days. There were few of them which held up under the gruelling 10-day test and showed beyond argument that the gasoline car really is to be reckoned with when it comes to army field transportation.

The pack wireless set which heretofore has been transported on pack mules, was carried through this year's maneuvers in Michigan on a truck built by the Alden Sampson Mfg. Co., of Detroit. It was rated to carry a load of 1,500 pounds and in the campaign it carried six men averaging 150 pounds and the complete wireless equipment which is a rated load for four pack mules. Ten riding animals and the four pack mules were displaced. At best the mobility of such a unit does not average over 20 miles per day, while the same distance is 1 hour's comfortable work for the section transported on the truck.

The machine was ready for instant use during the entire 10 days and was operated over all sorts of roads. To complete the test and give the officers assurance that the truck would handle itself and its load over all roads, it was packed with the entire wireless equipment and camp equipment for the use of the six men who rode in addition to extra personal equipment for the comforts of the men. The truck was driven across country from Ludington loaded far beyond its capacity, care being taken to put the route over the worst available roads in that general direction. The trip was made without any forced stops whatever and with no motor or car trouble whatever, it is reported.



PLAN VIEW OF URBAN ELECTRIC CHASSIS

Among the Makers and Dealers

NEW BRANCH PLANT OF KISSEL MOTOR CAR CO. IN MILWAUKEE

CHANGE of Name—The Henry Lee Power Co., Chicago, has changed its name to Old Reliable Motor Trucks Co.

Moon Business Increased—The Moon Motor Car Co., of St. Louis, announces it increased its business this year 217.1 per cent.

Premier Plant Expanding—The Premier Motor Mfg. Co., Indianapolis, is about to let contracts for two large additions to its plant. These will be two-story brick structures, one 40 by 148 feet and the other 40 by 140 feet.

Amplex Making Big Plans—If plans now being formed by W. J. Mead, president of the Amplex Motor Car Co, of Mishawaka, Ind., which is the reorganized Simplex Motor Car Co., are carried out the plant will be enlarged to double its present size and all parts of the car will then be made at the Mishawaka factory, including the aluminum bodies. The company will in a short time put on a larger force of workmen.

Electric Car Show for New York—The sixth annual New York electrical exposition and motor car show will be held at the Grand Central palace October 9-19. Three floors will be used for the exhibition which promises to be the largest and most complete of its kind ever held. Trucks will be the feature of one section of the show and pleasure cars of nearly a score of types will be exhibited in another. On the third floor a track 1/10 of a mile around will be installed for demonstrating purposes and for the instruction of customers. The electric vehicle companies that have contracted for space so far include the following: General Vehicle Co., General Motors Truck Co., Buffalo Electric Vehicle Co., Anderson Electric Car Co., Lansden Co., Studebaker Corporation, Atlantic Vehicle Co., Baker Motor Vehicle Co., S. R. Bailey Co., Champion Electric Vehicle Co., Cleveland-Galion Co., Ward Motor Vehicle Co., Edison Battery Co., Electric Storage Battery Co., Philadelphia Storage Battery Co., and the Gould Storage Battery Co.

Medal for Kissel Truck—The Kisselkar truck has again won the first prize at the California state fair, and acquired the gold medal that symbolizes the honor. This is the second year that this honor was given to the Kissel Motor Car Co.

Studebaker Staff Meets—About thirty branch managers and officers of the Studebaker Corporation met at a dinner at the Pontchartrain hotel, Detroit, on September 26, the occasion being the annual meeting for the discussion of the coming season's campaign. The Studebaker plant in South Bend, as well as that in Detroit was inspected.

McDonald to Be a Professor—If a sufficiently large appropriation can be gotten from the state legislature, the University of Missouri will establish this year a department of instruction in motor car engineering. Stewart McDonald, vice-president and general manager of the Moon Motor Car Co., is to be the professor in charge of this department.

Another Self-Starter — The Merralls Starter Co. has been organized in Detroit with a capital stock of $150,000, to manufacture a compressed air type of starting apparatus, which is the patented invention of W. A. Merralls. It has not been definitely decided as yet whether the concern will locate in Detroit or in the east, but in all probability Detroit will be chosen. It is proposed by the new concern to erect a two-story factory to take care of an output of about ten starters a day. Plans for such a structure have been made and they call for a building measuring 60 by 160 feet. The starter utilizes part of the explosion pressure of each explosion to compress the gas which is stored in a tank. The incorporators are W. A. Merralls, R. S. C. Neely, F. J. Van Pelt and H. R. Lowland.

Illinois Dealers Call Meeting—After being inactive through the summer months, the Automobile Dealers' Association of Illinois, will be revived this month and will hold its annual meeting at the state fair grounds in Springfield on October 8. Officers will be elected for the ensuing year and other business transacted.

U. S. Tire Co.'s Production Plans—All of the United States Tire Co.'s factories will be operated during the coming winter on full summer schedule. This means that they will be run night and day, three shifts of workmen being employed. Last winter was the first time in the history of the tire industry that it was considered necessary to maintain a full summer working schedule throughout the so called off season. The plan worked so satisfactorily that its continuation was decided upon. The four factories produced more than 1,250,000 tires during the year and their 1913 output will be far in excess of this number, the equipment of all of the factories having been increased, and a new plant being in contemplation.

Changes in Boston—The coming of October has seen a number of moves on the motor checkerboard in Boston that has changed the aspect of the local colony somewhat. The moving of the Oldsmobile company from Massachusetts avenue to Commonwealth avenue in the Back Bay allowed the Buick branch to move from the Motor Mart to the Oldsmobile's former quarters. Into the old Buick quarters moved the Tyler Brothers' Corporation with the Little, Chevrolet and Columbus electric. Then the Rambler got out of its salesrooms next door to the Oldsmobile, moving to its new home in the Back Bay and J. W. Bowman & Co., agents for the Stevens-Duryea and Waverley electric, quickly moved into the Rambler's old place on Massachusetts avenue. This left a vacancy on Boylston street where Bowman had his salesrooms and into this has moved the R. C. H. branch from Copley square. So there was a vacancy in Copley square and this was quickly taken by the Roberts & Sherburne Co., agent for the American. The Oakland has moved up to 823 Boylston street and the vacancy caused by this has been gobbled up by the new agency for the Pope-Hartford. The retirement of the S. F. Wise Co., that had quarters on Boylston street allowed the Franklin agency to move back again to that street, going into the Wise salesrooms. In all the years that the motor colony has been established in Boston there has not been so many moves made within

such a short period, the various changes having been brought about within a couple of weeks and most of them within a week.

To Make Rotary-Valve Motor—The Parker Motor Co., of Detroit, has been formed to promote the sale of a rotary-valve motor which is the invention of Victor C. Parker, formerly of Winnipeg, Canada.

To Get Cars Off Streets—A building designed exclusively for the parking of motor cars, now left standing on the downtown street of Toledo, to the detriment both of the cars and the public, will be erected at 324-326 Huron street by H. W. Wachter. The building will be fireproof, two stories in height, 60 by 40 feet. The approach will be through an alley in the rear of Nicholas building. At present Huron street between Madison and Adams streets is lined with cars all day so that traffic becomes difficult.

Kissel's New Branch Plant—The Kissel Motor Car Co., of Hartford, Wis., has acquired the former Romadka trunk works on Center street, between Thirty-first and Thirty-second street, Milwaukee, Wis., and is now converting the plant into a motor car factory which will serve as a branch of the big Kisselkar works in Hartford. The Romadka Brothers Co., up to the time of its failure last spring, owned and operated one of the largest trunk and bag manufactories in the United States, having more than 200,000 square feet of floor space at its disposal. All of this space will be used by the Kissel people. It is proposed to use the Milwaukee branch for the production of two complete models of the Kisselkar. The Hartford works have been badly crowded for more than 2 years, despite the constant addition of new buildings, and the production has continually been hampered by this condition. Now, in addition to the big works, the company has an opportunity to acquire possession of a large factory structure in Milwaukee, which has unusual facilities for manufacturing, and it was quick to take advantage of this chance to establish the much-needed additional factory, which is only 37 miles from the main works. The location of a branch in Milwaukee does not mean that the Kissel people intend to abandon the Hartford works eventually, as the present main works cover many acres of ground and are among the largest of the kind in the west.

Tiffin to Make Trucks—It is announced that the Tiffin Wagon Works, at Tiffin, O., is preparing to enter the motor truck field and expects to place a line of these vehicles on the market next spring. Agencies already are being established and arrangements for placing the new machines on the market perfected.

Will Make Motors—Work started Monday on the construction of the Julian Motor Co.'s new factory at Messina Springs, N. Y. Fifteen acres have been acquired as a building site and it is expected that the factory will be in operation by February 1, 1913. The company is comprised of Syracuse men and it will put out motors for cars, boats and stationary engines. The officers: Julian Brown, president; John F. Bartels, vice-president; G. Aberdeen Young, treasurer; Ernest W. Lawton, secretary.

Municipal Garage Planned—Officials of Indianapolis have in mind establishing a municipal garage beginning January 1, in which all of the motor cars used by the city will be taken care of. It is thought considerable money can be saved by buying oil, gasoline and other supplies in large quantities under contract and by having repairs made by a city mechanician. At present each city department looks after the cars it has in use, buying supplies for them in small quantities. Repairs are made at various public garages.

To Sell Selden Truck Output—The Selden Truck Sales Co., of Rochester, N. Y., has just been incorporated with a capital of $150,000 to handle the entire truck product of the Selden Motor Vehicle Co. The incorporators are George C. Gordon, W. C. Barry, Jr., R. H. Salmons, Henry G. Strong and Charles H. Stearns, all of Rochester, N. Y., the first three named being officers of Selden Motor Vehicle Co. The object of this selling organization is to sell motor trucks direct from the factory to the user upon terms of easy payments. The Selden Motor Vehicle Co. will continue its pleasure car business under the same management as heretofore, offering a medium-priced touring car either direct or through dealers.

May Move to Detroit—There is some talk of moving the entire plant of the Lewis Spring and Axle Co. to Detroit from Jackson, Mich., according to a statement made by President Lewis. The bulk of the concern's business comes from Detroit and the location there would be more convenient.

Increases Engine Plant Capacity—The Milwaukee Motor Co., Thirty-second and Burleigh streets, Milwaukee, Wis., has completed additions and improvements which will increase its capacity by one-third. The company manufactures motors for pleasure cars and commercial vehicles, furnishing the power plants for all Imperial cars, made at Jackson, Mich. More than $70,000 worth of new machinery and equipment has been installed during the summer months.

Queer Legal Battle—The battle among three concerns with similar corporate titles for the right to open mail is still being carried on at Racine, Wis., by the J. I. Case Threshing Machine Co., J. I. Case Plow Works and J. I. Case Co. The post-office department has given the right of priority in opening mail addressed to Case companies to the J. I. Case Threshing Machine Co., the oldest of the three, but application has now been made by the other two companies that a referee be appointed by the courts to open and distribute all mail matter.

New Hess-Bright Factory—The new factory and office of the Hess-Bright Mfg. Co. at Front street and Erie avenue, Philadelphia, Pa., has a frontage of 200 feet and a depth of 235 feet. The entire second floor to a depth of 35 feet is devoted to offices. Back of the offices the building is one story high with sawtooth roof. As the bulk of the company's business is importing, the shops will be used at present only for repair work and for manufacturing the new double row bearings. The present building forms the nucleus of a much larger plant which it is intended eventually to erect.

NEW FACTORY AND OFFICE OF HESS-BRIGHT MFG. CO. IN PHILADELPHIA

Development Briefs

New Pitless Garage Turntable of Compact Design—Folding Lavatory for Motor Cars Is Latest—Bosch Brings Out Waterproof High-Tension Magneto—Single-Jet Burner for Acetylene Motor Car Lamps

FIG. 1—DISTRIBUTOR END OF BOSCH ZR 4 MAGNETO

Simple Turntable

A NEW turntable of unusual simplicity, which is of the pitless type, yet quite low, is manufactured by George P. Nicols & Brother, Chicago. It is designed to be installed on top of the garage floor, the platform being 5 inches above the floor, access to it being obtained by the use of a cast iron bridge which is inclined upward. The turntable is built on a steel frame and turns on a ball bearing at its center, and is said to turn so freely that a child easily can move the heaviest car. Incidental advantages set forth by the manufacturers are that with such a turntable a narrower and less expensive driveway may be used than where it is necessary to back out of the garage, and that a car standing on it may be turned to any angle in reference to the light for washing and repairs. These conveniences in addition, of course, to the urgent advantage of immunity from the dangerous practice of backing out of a garage, especially at night, are urged.

Folding Lavatory for Motor Cars

An innovation in luxury is introduced by A. B. Sands & Sons, New York, in the form of a complete lavatory equipment for limousines and touring cars, which when folded out of the way consumes little space, but when opened provides a wash basin, with running water, a compartment for comb and brush, etc., and a shelf for towels. A lid over the upper portion opens up to expose a mirror on its inner side. The supply is taken from a tank on the roof of the car, or under the body of the car, and piped to the lavatory, where a swiveled, self-closing faucet conducts it to the bowl. The complete outfit weighs but 18 pounds. When closed, the case is 22¾ inches high, 13¼ inches wide, and 4½ inches deep. When open, the bowl projects 15¾ inches, and the mirror raises the total height to 30 inches.

Waterproof Magneto

The latest addition to the Bosch magnet family, Figs. 1 and 2, is a development of type DR, differing in the type and number of magnetos used, and in the fact that the new magneto was especially designed to be waterproof. The magnets in the new instrument are two in number, and of an especial comb design at their ends, or pole-shoes, which makes them more effective, it is claimed, than the three double magnets used on the parent model. It is said that this magneto generates at lower cranking speeds than former types, and that as large a spark is produced at low speeds in the retarded position as in full advance. The claim is made that this permits the engine to be started on the magneto spark alone, at no more than ordinary cranking speed.

The new machine is made dust, oil and waterproof by means of a protecting hood, which is fitted over the shaft end of the magneto, inclosing the slip ring connection and the safety-spark gap, and fitting closely against the magnets. This joint is packed, as is the space between the magnets, and the distributor plate at the opposite end. Instead of the carbon brush in the base of the instrument formerly used to insure a ground from the engine to the grounded portion of the armature windings, the new magneto has two of these brushes, located in hollow screws in the end plate of the circuit breaker assembly. The bearings of the new magneto have been somewhat amplified, and the cover plates of the oil ducts have been provided with rounded overhanging edges, to facilitate the draining off of water. This magneto is adapted for use in a dual system, and a double-spark magneto is also made in this type.

FIG. 3—PACIFIC DOUBLE RECOIL CHECK

FIG. 2—BLACK EAGLE SPARK PLUG AND TROY MOTOR CAR LOCK

Roni Acetylene Burner

A new type of gas burner for use in motor car lamps has been introduced by William M. Crane Co., New York. This burner differs greatly from the ordinary tip in that it has but one jet, the orifice of which is twice the size of the usual hole in the double opposed jet. The lava tip is usually made in the form of a Y, two small holes projecting the gas to the center of the crotch, the gas spreading out in the form of a fan, when brought into collision. For an equal volume of gas, it follows that the holes, when two in number, must be of necessity of small diameter, when compared with the size that would be required if but one hole were used. Small holes are naturally more inclined to clog than large ones, and must be cleaned with delicate needles.

Bray's Roni burner, on the other hand, has but one opening, elongated in form

Novelties for Motoring

Leather Rebound Straps from California—Combination Lock for Gearshift Lever—Spark Plug Has Pitless Electrodes and Simple Spring Terminal—Valuable Device for the Use of Tire Repairmen

instead of round, projecting, because of its shape, a flat and elongated flame. The faults of warping, and consequent disalignment of the lava tip, of clogging of one tip, and the destructive overbalance of the flame as a result, and the frequent cracking of the reflector when the rear hole becomes closed and the forward jet projects a single pencil of flame against the mirror, and the bothersome clogging due to the minute size of the lava orifices, are eliminated by this burner, it is claimed. The Roni burner is cleaned with an ordinary tooth brush. It is claimed to be superior to single-jet burners, in that, owing to its peculiar construction, it burns more air than other burners.

FIG. 4—PACIFIC SINGLE REBOUND STRAP

Black Eagle Spark Plugs

At least two distinctive features distinguish the Black Eagle plug, which is the product of the Standard Co., Torrington, Conn. The first of these is the sparking points, which are two in number. Their arrangement may be seen in the end view in Fig. 2. The central electrode is of the usual straight wire type, the negative electrodes, two in number projecting from the shell, tangent to the central electrode, thus presenting only round surfaces to the spark, which is claimed to prevent pitting. The other is a spring cap, which requires no screwing, is said to be unaffected by vibration and is adapted to receive the old styles of terminals, which are now so cheap, or the plain wire alone if necessary.

Troy Combination Gearshift Lock

The Troy Carriage Sun Shade Co., Troy, O., has just brought out the Troy automatic auto-lock, Fig. 2. This lock is operated by a combination, and is secured to the gearshift lever, just above the quadrant. A knife latch is dropped into the H-gate, to lock the lever in neutral. This blade passes through a slot in the lever, so all of the strain comes on the lever, and not on the lock itself. It is held down by a bolt, secured by a triple or quadruple disk combination, which is operated by a series of buttons. These are each pressed a certain number of times to open the combination. This combination may be adjusted by the owner by removing the face-plate of the instrument. This only can be done by the aid of a key, which only can be inserted with the combination in the unlocked position. When locked, the lever or H-plate must be cut or broken, it is claimed, to move the lever. It does not prevent the moving and steering of the car by hand if necessary, to remove the car from the garage, in case of fire. It is offered in two styles with either triple of quadruple disk combinations.

Tire Wrapping Machine

In retreading tires, one of the most difficult features of the repair is the wrapping of the tread bandage. This usually requires the services of an expert of skill, great physical strength and fidelity. To make this operation practicable where the services of such a man are not available, R. G. Rossman, of Seattle, Wash., is manufacturing a tire bandage wrapping machine, which does this work mechanically, and without the exertion of excessive labor on the part of the operative. The device consists of a forked frame in which the tire is held. The wrapping machine is mounted to the tire by three rollers, and in action is simply rotated about the tire, a bandage spool holding the wet bandage under pressure. The operator rotates the machine about the tire, which wraps it evenly and with uniform pressure. The device will wrap any size tire from 2½ inches to 6 inches tread, and any diameter. Any type of retreading rim may be used.

FIG. 6—DRIVING END OF BOSCH WATER-PROOF MAGNETO

Pacific Leather Accessories

Fig. 4 illustrates a jounce preventer which consists of an ordinary rebound strap, equipped with chrome vanadium steel springs, which cushion the restraining effect, and give the springs a velvety action. Fig. 3 shows a double type of recoil check for special installation, where the single type cannot be applied. These appliances are products of the Pacific Leather Works, Oakland, Cal. Numerous other leather accessories are included in its line, including inner and outer blow-out patches and preventers, belts and belt lacing, and tire treads.

FIG. 5—SANDS FOLDING MOTOR CAR LAVATORY FOR TOURING

New Electric Headlight

Car Lamp Has Quick Removable and Demountable Bulb Socket

SEVERAL new wrinkles are embodied in the design of Electric Star Headlights, which are manufactured by the Milwaukee Bronze Casting Co., Milwaukee, Wis. In Fig. 8 is shown a three-quarters rear view of the style D headlight, showing the quick-change bulb feature. The bulb is mounted on an insulated hub, which is equipped with a small thumbscrew used to adjust the focus. This hub carries all wiring, and is self-contained, being well adapted to use as a trouble lamp. It is inserted or removed from the body of the lamp by a simple twist, a lock nut, shown in the cut, holding it firmly in place. The body of the lamp is of cast silver-aluminum, about 3-16 inch thick, the interior being parabolic in form and brought to a high polish. This form of reflector, besides its obvious advantages of lightness and simplicity, is proof against tarnish, and because of a slight bluish tint, improves the quality of the light, it is claimed. No solder or rivets are used in the construction of these lamps, and the lenses are laid in rubber, to prevent their rattling or becoming cracked by road vibration. The bulbs are secured by the Edi-swan bayonet catch base, which makes them immune to road vibration. The complete line includes headlights, sidelights, auxilliary headlights, to be applied to gas lamps, and tail lights, all of which are electric, in various candle-powers.

Cummings Valve Lifter

Small in size, light in weight, and simple in construction, the Cummings spreading plier, made by the Cummings Plier Co., Canton, Ohio, is used in lifting valves. The jaws are made with two prongs, to enable them to encircle the valve stem, and are made thin at their ends, to enable them to be inserted between the coils of the spring, if necessary. They are made with a hinge joint, which permits them to be reversed and a ring clamp to fit over the ends of the handle to hold the jaws apart. They weigh 14 ounces each, and are 8 inches long, which makes them convenient to be carried in the tool-kit.

Cold Vulcanizing Without Acid

U-Vulk is a new vulcanizing compound that is claimed to vulcanize tires and tubes permanently, without the use of either heat or acids. It is sold in outfits, packed in cylindrical cartons, 7¾ inches by 2½ inches, containing a roll of linen-backed para rubber, a dozen inner tube patches, a sheet of car cloth, two brushes, and a bottle each of U-Vulk liquid rubber and liquid vulcanizer. These latter are the features of the outfit, the former of which is a special preparation of extremely tacky rubber, that with the aid of the latter, which is an especially compounded cement, readily unites with rubber. Full directions are inclosed in the outfit for making every kind of tire repair.

Among the advantages claimed for this process of repair, the fact that no heat or acid is used, is urged as a factor of time saving, safety to the tire, and safety to the user; the ease and dispatch with which cuts may be filled, and digouts patched up, is advanced as a measure of economy and prevention of blowouts, as most repair shops will not bother with such trivial repairs, which none the less rapidly develop into blowouts if neglected; and that punctures in tubes may be vulcanized by this process is less time than is usually required to make a cement patch.

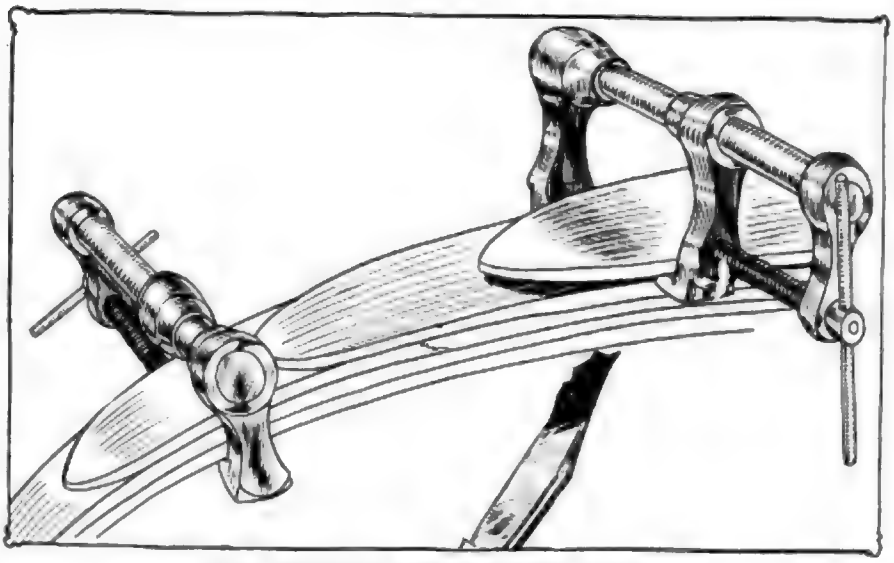


FIG. 7—SPRING LEAF SPREADER AND CLAMP

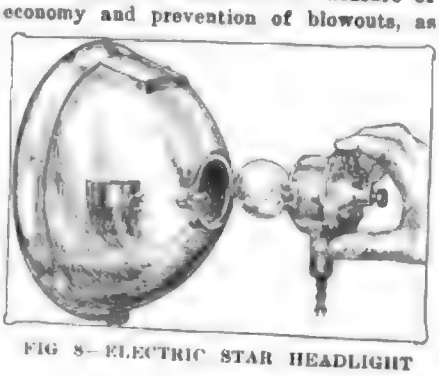


FIG. 8—ELECTRIC STAR HEADLIGHT

Tire Repair Equipment

Two time-saving appliances have just been offered by the Williams Machine and Foundry Co., Akron, O., to aid in retreading tires. The first of these is a quick-opening steel tire kettle of the vertical type that is designed to save time and tires. The lid of this kettle is secured by means of a turnbuckle at its center, which bears against an overhead crane, no bolts being used to secure it. It has a grating at its bottom, that raises the tires above the bottom, and prevents their resting in water, permitting steam to circulate entirely around them. Its capacity is four tires of under 42 inches in diameter, and is tested to 75 pounds steam pressure.

The other device is a tread rolling machine that accomplishes by machinery an operation which, if done by hand, is one of the most difficult in the tire shop. The new arrangement consists of a pair of rollers, convex and concave, respectively, mounted on an iron frame. The upper roller is raised or lowered by means of a large hand wheel at the top, to permit the tire to be inserted. Turning a crank rotates the tire by means of the lower roller, springs in the connections to the upper roller maintaining an even pressure on the tread.

Spring Leaf Lubricator

The Spring Leaf Lubricator Co., Ann Arbor, Mich., has made the lubrication of springs easy by a wedge tool, Fig. 7. This tool is simply a double wedge screw clamp, and consists of a round shaft, to either end of which are secured respectively a solid foot and an arm, between which a sliding jaw is placed. This jaw corresponds in shape with the foot, having a wedge tooth projecting at right angles in opposition to a similar projection on the foot. A screw, ball-jointed to the sliding jaw, and threaded to the solid arm, is turned by means of a cross rod to slide the jaw toward or away from the opposing foot. To lubricate the leaves of a spring, the tool is spanned across the spring. With the points of the wedge teeth inserted between two leaves, and the screw turned up until the leaves are well separated, when a little oil, grease or graphite is placed in the crack, and the tool removed. It is also adapted for use as a temporary clamp in case of a broken leaf, as shown.

Non-Mercury Rectifier for Charging

Operating on the electrolytic instead of the mercury vapor principle, the Sirch Rectifier, a product of the Sirch Electrical and Testing Laboratories, Los Angeles, Cal., is claimed to be one of the smoothest of small rectifying devices. By means of a pair of condensors immersed in a

special solution and a coil consisting of a laminated soft iron core, wound with insulated wire in a closed magnetic circuit, a steady even flow of direct current is produced from an alternating current without the use of wasteful resistance, and without the irregularity attendant upon most rectifiers of the mercury arc or mercury vapor type. So steady is the product of this device, it is said, that it has heretofore been used almost exclusively for telephone duty, where the requirements are perhaps the most severe on any rectifier.

The efficiency of this device is said to be in a large measure the result of the form of solution employed, which, it is asserted, does away almost entirely with the cleaning or replacement of the electrodes, due to the fact that the solution acts as a solvent of the oxy-hydrate which tends to form on the electrodes. It is also claimed that the solution is stable and of long life.

Automatic Tire Pump

Driven from the flywheel, the Little Trojan automatic tire pump is marketed by Woodward and Son, Toledo, O. The pump is of the cylinder and piston type, and is mounted by an adjustable bracket to the frame or subframe of the car, deriving its power from friction against the flywheel. It is claimed that this pump, owing to its mounting, may be applied to cars which could not be equipped with any other make of flywheel pump. It is simple and automatic, being operated from the dashboard. When set for a certain pressure it will inflate the tires to just that pressure, it is claimed, automatically releasing itself when the designated pressure has been obtained. It is said to require less lubricant than any other pump of its type, and when the special vegetable lubricant furnished by the manufacturers is used, is said to be non-injurious to the tires.

The use of these devices is to be strongly advised as a measure of prolonging the life of the tire, as through the saving of time and labor effected by them, owners are less liable to run on soft or deflated tires, or to under inflate them, as they are prone to when forced to pump them up by hand.

Rubber-Aer

Similar to others of the rapidly increasing array of air substitutes for pneumatic tires, but with unique claims, Rubber-Aer, is marketed by The Rubber-Aer Sales Co., of New York. The substance is a composition of ingredients and chemicals, which in combination resembles rubber, but are claimed to be more lively and resilient. It is prepared for use by melting and injecting it into the tire tube, chemicals being added which solidify it and render it insoluble. After this treatment, it cannot be again melted, and will stand heat to the extent of 175 degrees beyond the melting point of rubber. It is injected into the tube through a special valve under pressure. This pressure may be made as high as needed, in the same manner as air.

Claims are made that this substance excludes air from the interior of the casing, and therefore relieves it of the harmful effects of air; that Rubber-Aer contains ingredients beneficial to the longevity of rubber; that the casing may be used until worn far beyond the limit of usefulness, when inflated with air; that it will not become hard or dry, or crumble; that it will not flatten under the standing weight of the car; that it is 33⅓ per cent lighter than other fillers; and that it will stand a temperature of 459 degrees without deleterious results.

Men-Do Tire Compound

To take the place of vulcanizing, patching, and acid curing, Men-Do, a product of the Liberty Rubber Co., Orange, N. J., is offered in outfits put up in cartons for use in making roadside tire repairs. This substance is a spongy compound of unvulcanized rubber, which is used to fill cuts, dig-outs, and blowouts in tires, and to patch punctures in tubes. It is said to weld itself firmly to the rubber and to become a part of the tire or tube. No heat is required in its use, only the customary scarification with emery or sandpaper, and treatment with gasoline for the purpose of softening the rubber to facilitate the colloidal union between the two substances. A liquid cement is applied to the rubber surface before the application of the compound. The Men-Do is then thoroughly kneaded and worked into the surface to be repaired.

FIG. 9—TESLA ILLUMINATED LICENSE PLATE

New Unisparker Model

Mechanical-Break Vibratorless Ignition System Improved for Coming Season

ADAPTED for use in conjunction with the electric starting and lighting systems that are rapidly becoming standard in cars of all classes, the Atwater Kent ignition system is offered for the new season with several improvements and the additional feature of automatic spark advance. The new instrument, Fig. 10, designated as Type K, operates on the same principle as past models, viz., the production of a single hot battery spark at the exact sparking moment, the current being broken mechanically instead of by means of the usual vibrator. The primary circuit is completely insulated, making this system especially adapted to use in cars having electric starting and lighting systems. Among the claims of the manufacturer for this device are extreme silence, absence of improper timing at any speed, absence of primary grounds, and economy of current. The coil, which is non-vibrating, is furnished with either a standard or kick switch equipment, with a starting button.

Tesla Illuminated Number Plate

To enable motorists to comply with the stringest laws affecting the lighting of the license number, that have been enacted in several of the large cities, the Tesla Transparent Steel Number Plate has been brought out by the Tesla Transparent Steel Number Plate Co., of Chicago. This accessory, Fig. 9, consists of a metal box, the front covered with wire gauze, to which the numbers are riveted. The inside is enameled in flat white, which is said to diffuse the light better than bright metal or enamel. A small electric lamp in the top of the box, shines through a ruby lens, thus taking the place of the tail light. The plate is equipped with either parallel or angle brackets, to be attached in a convenient position at the rear of the car.

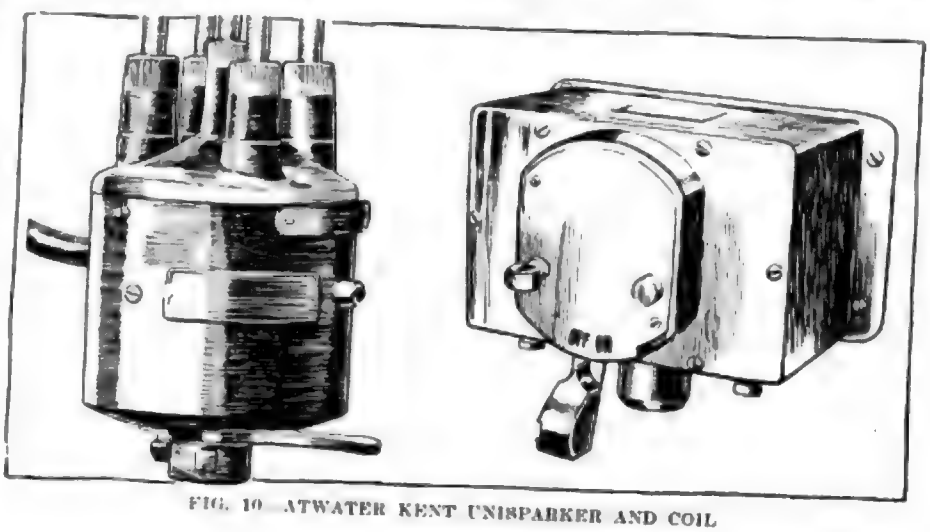


FIG. 10—ATWATER KENT UNISPARKER AND COIL

MONTREAL—The Bellerive garage is handling the Mitchell car locally.

Kansas City, Mo.—The George L. Schofield Motor Car Co. has organized to handle the Marion line.

New York—Manager C. S. Henshaw, of the Thomas Motor Co., has established temporary quarters in the Automobile building, 1926 Broadway, New York.

Philadelphia, Pa.—Herbert S. Landell has been appointed retail sales manager of the new Oakland Philadelphia factory branch, 506-508 North Broad street.

Boston, Mass.—S. J. Wise & Co., eastern distributor of the Amplex and King cars, have discontinued their branch in Boston and will do all its business for the New England territory through the New York headquarters.

Buffalo, N. Y.—Joseph C. O'Rourke, for the past 6 years connected with the Pierce-Arrow Sales Co. here, has resigned to assume management of R. G. Danahy & Co., local Lozier agents, at 846 Main street.

Tulsa, Okla.—The Tulsa Automobile and Mfg. Co., which makes light delivery motor wagons for oil-field work, has elected the following officers: President, M. A. Younkman; vice-president and general manager, George H. Seager; secretary and treasurer, Schuyler C. French; superintendent, M. A. Campbell.

Montreal—A new taxicab company to operate in Montreal has been given letters patent by the lieutenant governor, under the name of the Mount Royal Garage Co., with half a million dollars capital. The promoters are James A. Brooks, George Ross, Senator F. L. Beique, F. A. Beique, and L. J. Beique.

New York—Ray P. Johnson has been appointed general manager of the Warner Gear Co., of Muncie, Ind., to succeed C. E. Davis, who has been named general manager of the motor car department of the American Locomotive Co. at Providence. Mr. Johnson received his technical education in the scientific department of the Chicago university.

Columbus, O.—The Park Motors Co. is the name of a corporation to be chartered soon under the laws of Ohio, to have an authorized capital of $150,000, for the purpose of manufacturing both gasoline and electric cars. The promoter of the corporation is Scott Van Etten, formerly with the Columbus Buggy Co., of Columbus, in the capacity of head of the repair department.

Toledo, O.—What is claimed will be one of the finest car salesrooms in this part of the state will soon be established in the new business block to be erected corner of Madison avenue and Fifteenth streets. L. E. Barger has leased the corner room. Mr. Barger represents the Abbott Motor Sales Co., with the agency of the Abbott-Detroit and the Pope-Hartford cars. The adjoining room has been leased by Charles J. Lauer, Toledo agent for the American and Marion cars, and the easterly room will be occupied by E. W. K'Burg, of the Hupp-Yeats Sales Co.

Philadelphia, Pa.—The Zee Zee Tire Co. has established headquarters at Thirty-third and Walnut streets.

Sparta, Wis.—William Stokes is erecting a new fireproof garage at Sparta, to be 50 by 90 feet in size. The garage will be managed by A. H. Scheppke.

St. Louis, Mo.—The Moon Motor Car Co.'s growth has necessitated the opening of a salesroom and agency in St. Louis to help the factory take care of the Moon business in that city. The new agency is the Lewis Automobile Co., located at 4108 Olive street, of which J. D. Perry Lewis is the president.

Columbus, O.—The Neil-Fourth garage is the name of a new concern opened in a new four-story building at 241 West Fourth avenue, to do a general garage and repair business. The concern is equipped with a complete repair plant and a charging apparatus. There is about 9,000 square feet of floor space. S. Van Etten is manager of the company.

Philadelphia, Pa.—The Automobile Service Association, a mutual service corporation launched about a year ago, the main offices of which are located at Fifty-second and Chestnut streets, has opened its twelfth branch, at Lancaster, Pa. In addition to the main office and several branches in this city, the association now has branches in Lancaster, Pa.; Atlantic City, N. J.; Camden, N. J.; Pitman, N. J., and Morriston, Pa., and contemplates the establishment of branches in the leading cities of Pennsylvania and New Jersey. S. M. Waas is president of the association and G. W. Carrington vice-president and general manager.

South Bend, Ind.—John W. Nikart, proprietor of the Michigan avenue garage, has taken over the agency for the Maxwell.

Milwaukee, Wis.—Clarence R. Kilbourne, for the past year Milwaukee representative of the Case, has resigned to become general manager of a new company which will distribute the Kisselkar in Canadian territory, with headquarters at Alberta, Can.

Boston, Mass.—George L. Dodd, a dry goods merchant, and Charles E. Consens, a member of the big banking firm of Downer & Co., are the two men who have put up the money for the new Pope-Hartford agency in the Hub. The former is president and the latter treasurer. Fred P. Lucas is sales manager. E. P. Dodge, who had the agency, has retired because of ill health.

Toledo, O.—Work on a new building to be occupied by the Landman-Griffith Motor Co., will be started immediately, and the place will be ready for occupancy December 1. It will cost about $25,000. The new building which will be erected on Madison avenue corner Fourteenth street, will consist of one story and basement. There will be a 40-foot frontage on Madison avenue. Plans for the building are unique, practically all of the two street sides to be made of glass, giving a complete exposure for the large sales room. Flanders cars, gasoline and electric will be handled. Charles P. Landman, formerly vice-president of the Blevins Automobile

Brief Business

RECENT INCORPORATIONS

Augusta, Me.—Mathiessen Spring Cushion Wheel Co.; capital stock, $60,000; directors, R. S. Russell, L. J. Coleman, C. L. Andrews.

Brooklyn, N. Y.—Mears Motor Vehicle Co.; capital stock, $600; incorporators, J. W. Mears, E. A. Kellam, C. Mears.

Brooklyn, N. Y.—Monarch Auto Trucking Co.; capital stock, $5,000; incorporators, D. R. Rice, H. Person, W. H. Babcock.

Brooklyn, N. Y.—Haab Garage Co.; capital stock, $2,000; directors, E. Haab, O. Hanman, L. Haab.

Camden, N. J.—Hub Twenty-Second Street Garage Co.; capital stock, $100,000; incorporators, F. R. Hansell, G. H. B. Martin, I. C. Clow.

Camden, N. J.—Blackstone Sales Co.; capital stock, $2,500; motor car supplies; incorporators, C. M. Fletcher, I. F. Goodrich, F. Ihrig.

Chicago—Schillo Motor Sales Co.; capital stock, $15,000; to manufacture and deal in motor cars; incorporators, L. Lorimer, E. W. Schillo, A. G. Schillo.

Chicago—Automobile Accessories Co.; capital stock, $25,000; incorporators, A. Marelli, F. J. Jackson, F. D. Marelli.

Chicago—South Park Automobile Garage Co.; capital stock, $250,000; incorporators, G. Frank, H. J. Lurie, J. L. Anderson.

Cleveland, O.—Cadillac Automobile Co.; capital stock, $50,000; to deal in motor cars and parts; incorporators, T. B. Bolton, W. Marlatt, F. H. Pelton, M. Jenkins, E. D. Hayes.

Cleburne, Tex.—Cleburne Motor Car Co. capital stock, $10,000; incorporators, H. E. Lucir, W. P. Ball, B. Doughlas.

Cincinnati, O.—Federal Motor Supply Co. capital stock, $250,000, to manufacture and sell motor cars, parts, etc., incorporators, G. W. Platt, E. C. Schmitt, R. L. Dollings, A. M. Braddy, M. F. Platt.

Dallas Tex.—Havoline Auto Supplly Co., capital stock, $10,000; incorporators, F. S. White, E. Hobby, J. W. Crotty.

Dover, Del.—Imperial Garage Co.; capital stock, $25,000; director, W. P. Lofland.

Elyria Auto Sales Co., capital stock, $10,000; to deal in motor cars; incorporators, W. G. Bennett, I. W. Eyon, F. S. Bates, C. H. Smith, J. J. Dillon.

Fort Worth, Tex.—No Patch Tire Filler Co.; capital stock, $110,000; director, J. A. Reynolds.

Grafton, W. Va.—Grafton Motor Co.; capital stock, $5,000; incorporators, H. J. Pracht, H. D. Caomerford, D. C. Peck.

Indianapolis, Ind.—Auto Finishing & Wonder Polishing Co.; capital stock, $50,000; directors, N. S. Tedrow, J. W. Cummings, J. J. Sheehan.

Indianapolis, Ind.—Auto Grand Co.; capital stock, $25,000; directors, George Oesper, E. B. Pfau, E. Hamman.

Jersey City, N. J.—Kosmak Electrical Co.; capital stock, $10,000; to manufacture horns and signals; incorporators, J. R. Cubitt, W. Kosinski, M. U. Curris, A. Curris, J. R. Mack.

Announcements

RECENT INCORPORATIONS

Kittery, Me.—Co-Operative Rubber Co.; capital stock, $500,000; to manufacture tires and rubber goods; incorporators, H. Mitchell, H. A. Paul.

Louisville, Ky.—Corydon, New Albany & Greenville Automobile Co.; capital stock, $2,000; incorporators, J. M. Ferguson, H. Rohlfing, J. Schlimlier.

Marietta, O.—Gerhart Spring Tire Co.; capital stock, $15,000; to manufacture motor car wheels; incorporators, J. A. Gerhart, G. O. Salzman, C. Hopp, O. C. Mohler, A. A. Schramm.

Minneapolis, Minn.—Twin City Motor Service Co.; capital stock, $50,000; incorporators, F. L. Gross, Abner G. Showers, W. A. Alden.

New York.—Industrial & Trading Co.; capital stock, $5,000; general commission business in motor vehicles and parts; incorporators, A. M. Becker, J. A. Lemlin, E. H. Ferguson.

New York.—New York Garage Association; capital stock, $2,000; general garage keepers' exchange; incorporators, C. H. Potter, L. J. Joscelyn, W. Burrows.

New York—Forty-Ninth Street Garage; capital stock, $1,000; incorporators, P. R. Towne, H. C. Knapp, R. H. McIntyre, Jr.

New York—Acton Taxicab Co.; capital stock, $2,000; incorporators, O. J. Griffin, W. Oakford, F. Oakford.

New York—Garden Garage Co.; capital stock, $10,000; incorporators, O. J. Griffin, F. C. Griffin, W. Oakford.

New York—Ames Automatic Shock Absorber Co.; capital stock, $25,000; to manufacture shock absorbers; incorporators, L. F. Bomeisler, G. H. Edwards, G. Isaken.

Paterson, N. J.—Standard Auto Co.; capital stock, $2,500; general motor car business; incorporators, C. Braun, W. F. Drexler, H. Stoehen.

Paterson, N. J.—Standard Garage Co.; capital stock, $25,000; incorporators, Martin White, S. B. White, O. Harris.

Portland, Me.—National Chauffeurs' Association; capital stock, $500,000; directors, A. F. Jones, T. L. Croteau, J. E. Manter.

Portland, Me.—Reliance Speedometer Co., capital stock, $100,000; directors, C. M. Drummond, G. M. Horne, W. B. Drummond.

Raleigh, N. C.—Motor Sales Co.; incorporators, D. F. Fort, Jr., T. C. Powell, R. H. Merritt.

Rochester, N. Y.—Fordham Co.; capital stock, $3,000; to manufacture and deal in motor cars; incorporators, G. F. Cox, E. A. Reinke, R. Stanton.

Rochester, N. Y.—Selden Truck Co.; capital stock, $150,000; to deal in motor trucks; incorporators, A. A. Barry, G. G. Gordon, R. E. Salmons.

Ruston, La.—Malbury Motor Co.; capital stock, $10,000; incorporators, J. D. Barkadale, W. F. Batson.

Seattle, Wash.—Seattle Motor & Wagon Mfg. Co., capital stock, $20,000; director, W. J. Beattie.

Utica, N. Y.—Otis Motor Sales Co.; capital stock, $10,000; incorporators, T. H. Ferris, W. T. Cantwell, E. J. Otis.

Sales Co., is president and W. E. Griffith, formerly connected with the Blevins company, is secretary and treasurer.

Philadelphia, Pa.—A new carbureter, the Feps, has recently been marketed by the Schoen-Jackson Co., of Media, Pa.

New York—R. M. Owen & Co. have moved their executive offices and the New York Reo branch to their new quarters at 19-21 West Sixty-second street.

Milwaukee, Wis.—The Kopmeier Motor Co., 375-389 Summit avenue, Milwaukee, has been appointed state agent for the Flanders electric, which has been represented by the Flanders Electric Car Co., with headquarters in the Kopmeier garage.

Hudson, Wis.—S. N. Palms has been elected president of the Hudson Garage Co. The other officers are: Vice-president, E. E. Mayer; secretary, G. A. Hanson; treasurer, Dr. L. P. Mayer; general manager, Christian Lee. The company is composed of approximately fifty owners of cars in Hudson.

Pittsfield, Mass.—Roy S. Bridge and Edward A. R. Brown, agents for the Cadillac line at Pittsfield, Mass., have moved their salesrooms and service station to 128 South street where Stackpole & Luce conducted a garage. The latter firm has dissolved partnership and the business will be carried on by Mr. Luce.

Tacoma, Wash.—H. A. Farr, who was in San Francisco a year ago and since then has been manager of the Portland branch of the United States Tire Co., has become manager of the Seattle branch. He succeeds H. A. Jones, who leaves to become manager for Ballou & Wright. C. H. Mayer, who has been working out of San Francisco, will be promoted to the managership of the Portland branch.

Kansas City, Mo.—The J. A. Davis Motor Car Co., of this city, distributor of the Thomas, has been declared bankrupted.

Boston, Mass.—The G. E. and H. J. Habich Co., agent for the Cole in Massachusetts, is remodeling its salesrooms on Massachusetts avenue.

Columbus, O.—J. B. Hoover, 621 North Fourth street, agent for the Lozier, has moved from East Broad street to 215 East Fourth street with the Coats Motor Car Co.

Boston, Mass.—President John H. MacAlman, of the Boston Automobile Dealers' Association, on his return from Europe, decided to enlarge his business and now, in addition to the Boston agencies for the Stearns and Columbia, he has opened up a branch at Providence, with Harry Farrow in charge.

Columbus, O.—The Curtin-Williams Automobile Co., 84 North Fourth street, has closed a contract to act as distributor in sixteen counties in central Ohio for the Cadillac in 1913. The company has closed subagencies with the Court Motor Car Co., Marietta and the Valley Motor Co., Zanesville.

Pittsburgh, Pa.—Preliminary plans soon will be started for a proposed car storage building to be erected at Twelfth and Sarah street, south side, by a company which is being organized at the present time by Augustus Hartje, 133 Wood street. The building will be constructed of concrete and steel, measuring 275 by 275 feet and costing in the neighborhood of $100,000. The roof will be of the saw-tooth type.

Omaha, Neb.—The Firestone-Columbus Motor Car Co. has taken the agency for Lambert pleasure cars and Mora trucks.

Montreal—The Montreal Automobile Garage Co., Ltd., has been incorporated with a capitalization of $185,000.

Chicago—The Storage Battery Power Co., 324 South Washtenaw avenue, has increased its capital stock from $100,000 to $250,000.

Haverhill, Mass.—The Merrimac garage was destroyed by fire last week and six cars and lot of valuable machinery were destroyed. The total loss was estimated at $10,000 on which there was only partial insurance.

Minneapolis, Minn.—The Prest-O-Lite Co., of Minneapolis, has bought 80 by 336 feet of property at Charles and Carlton streets, St. Paul, for $8,000, and will enlarge.

Chippewa Falls, Wis.—H. M. Lucas has been appointed mechanical manager of the Jenkins Auto Co. of Chippewa Falls, Wis. The company has made a large installation of oxy-acetylene welding apparatus and added a large list of equipment and machinery.

Boston, Mass.—The Boston Tire and Rubber Co., 182-184 Freind street, has discontinued the handling of unguaranteed casings. The company has now taken on the New England agency for Nassau casings, tubes, reliners, etc., made by the Thermoid Rubber Co., of Trenton, N. J.

South Bend, Ind.—Franklin S. Riley, of South Bend, has been appointed factory representative of the Standard Electric Car Co., of Jackson, Mich. He will handle the Standard electric in northern Indiana and southern Michigan. Mr. Riley will have his headquarters at the Smith garage.

Boston, Mass.—The Franklin Motor Car Co. has opened salesrooms at 733 Boylston street, recently occupied by the Marquette Motor Car Co. The Franklin quarters at 31 Irvington street have been retained as a garage and service station, the new location being devoted to sales and administration.

Milwaukee, Wis.—The W. E. Allen Co., 2807 Wells street, Milwaukee, state agent for the McFarlan six, has broken ground for a new garage building, to be situated at Grand avenue and Thirty-first street. The building will have ground dimensions of 60 by 120 feet, one story and basement high.

Toledo, O.—The J. W. Banting Co., which heretofore has conducted a motor car business in connection with its farm machinery store, has taken the general distributing agency for Paterson cars. This concern in the future will conduct the motor car business separately from other interests and has moved into sepa-

Recent Agencies Appointed by Pleasure Car Manufacturers

Town	Agent	Car
Atlanta, Ga.	O. C. Drew, Jr.	R. C. H.
Birmingham, Ala.	Robertson Tire & Auto Co.	Cole
Boston, Mass.	Tyler Brothers Corp.	Chrevolet
Boston, Mass.	Tyler Brothers Corp.	Columbus
Boston, Mass.	Fred H. Lucas	Pope-Hartford
Burlington, Ia.	Barton-Ford Motor Co.	Cole
Gardner, Mass.	Brown-Rawson Co.	Metz
Cedar Rapids, Ia.	Fred E. Koch	Cole
Chicago Heights Ill	William Konow	R. C. H.
Cleveland, O.	Henry J. Adams	Reo
Coatsville, Ind.	Frank Johnson	R. C. H.
Columbus, O.	Ross Garage	National
Columbus, O.	M. P. Murnan	Alco
Columbus, O.	M. P. Murnan	Moon
Columbus, O.	Pausch-Selbach Wagon & Auto Co.	Marathon
Columbus, O.	C. E. Ross Garage Co.	Great Western
Columbus, O.	O. G. Roberts & Co.	Overland
Columbus, O.	O. G. Roberts & Co.	Standard
Columbus, O.	O. G. Roberts & Co.	Stearns
Clarion, Pa.	W. H. Gulland & Co.	Cole
Clearfield, Pa.	Wallace Brothers	Cole
Claremont, N. H.	Edward F. Cushion	R. C. H.
Coshocton, O.	Standard Auto Co.	Imperial
Cyntniana, Ind.	A. D. Barton	R. C. H.
Eau Claire, Wis.	Tanbert Auto Co.	Cole
Fargo, N. D.	William Ball	Kisselkar
Fort Plains, N. Y.	Alphonso Walrath Co.	Franklin
Fredonia, Kans.	J. W. Paulen	R. C. H.
Fresno, Cal.	L. E. Grider	Henderson
Gardner, Mass.	Brown-Rawson Co.	Jackson
Gardner, Mass.	Brown-Rawson Co.	Nyberg
Greenfield, Mass.	H. E. Shaw	R. C. H.
Indianapolis, Ind.	E. M. Holmes	Cutting
Johnstown, Pa.	Daniel Statter & Co.	Cole
Kansas City, Mo.	A. D. Wright	Nyberg
Lewes, Del.	W. E. Walsh	Hudson
Lindsay, Cal.	E. C. Graham	Henderson
Logansport, Ind.	Harms & Cragun	Nyberg
Louisville, Ky.	Miles Auto Co.	Cole
Louisville, Ky.	Younger Auto Co.	Franklin
Lynn, Mass.	Sibley & Green	Studebaker
Lynn, Mass.	Sibley & Green	Hudson
Medarysville, Ind.	Guild & Hackley	Nyberg
Menessen, Pa.	Carmine Coccari	R. C. H.
Miami, Fla.	William V. Little	R. C. H.
Milford, Mass.	William H. Baker	Oakland
Milwaukee, Wis.	Kopmeier Motor Car Co.	Flanders
Milwaukee, Wis.	Smith-Hoppe Auto Co.	Detroit
Milwaukee, Wis.	Imperial Auto Sales Co.	Imperial
Naugatuck, Conn.	Richardson Brothers Garage	Cole
Maquoketa, Ia.	Palmer Auto & Supply Co.	R. C. H.
NewtonH'l'ds.Mass.	Woodworth Brothers	R. C. H.
Niagara Falls N.Y.	Arthur M. King	Cole
Opelika, Ala.	Isham J. Dorsey	Cole
Pacific Grove, Cal.	Herbert Nuttall	Henderson
Petaluma, Cal.	J. J. Tanner	Henderson
Pittsburg, Kans.	Charles B. Hunter, Jr.	Nyberg
Pontiac, Ill.	Pontiac Motor Car Co.	Cole
Princeton, Ill.	S. L. Bradley & Co.	Cole
Providence, R. I.	J. H. MacAlman	Stearns
Providence, R. I.	J. H. MacAlman	Columbia
Rockford, Ill.	Welch Brothers	Cole
San Jose, Cal.	J & R Auto Co.	Henderson
San Marcos, Tex.	E. F. Walker	R. C. H.
Santa Barbara Cal	B. C. Barry	R. C. H.
Schenectady, N.Y.	Brenner Co.	Detroiter
Sharon, Pa.	Citizen's Auto Co.	Studebaker
Sheboygan, Wis.	Erie Garage Co.	Rambler
Sheyenne, N. D.	L. S. Rudy	R. C. H.
Springfield, Mass.	Blue Ribbon Garage	Palmer-Singer
Springfield, Mass.	Blue Ribbon Garage	De Tamble
Springfield, Mass.	Dunbar Motor Co.	Overland
Springfield, Mass.	Dunbar Motor Co.	Abbott-Detroit
Springfield, Mass.	Dunbar Motor Co.	Elmore
Springfield, Mass.	Dunbar Motor Co.	Standard
Stockholm, Sweden	Backdahl & Co.	Cole
Stockton, Cal.	S. F. Ruff	Henderson
Sulphur Springs, O.	D. E. Schwab	Nyberg
Tacoma, Wash.	American Automobile Co.	Stearns-Knight
Tekamah, Neb.	Fred Carlson	Cole
Thurman, Ia.	Thurman Motor Car Co.	Cole
Toledo, O.	Bunnell Auto Sales Co.	Cole
Toledo, O.	E. W. Burg	R. C. H.
Wibaux, Mont.	Wibaux Auto Co.	Franklin
West Liberty, Ia.	West Liberty Auto Co.	Cole
Williamsport, Pa.	William Scheffer	Cole
York, Pa.	T. S. Pfeiffer	Chadwick
York, Pa.	J. W. Richley Auto Co.	Rambler

rate quarters. J. W. Banting is the head of the concern. John Gazely will manage the car branch.

Kansas City, Mo.—The Williams Motor Car Co., for many years distributor for the Locomobile, has changed from this car to the Alco line.

Appleton, Wis.—Joseph Kronzer and John A. Schmidt have organized the Appleton Garage and Auto Co., at Appleton, Wis., and are building a two-story garage, 48 by 120 feet in size at a cost of $15,000. Agency lines have not yet been selected.

Seattle, Wash.—P. E. Sands, formerly manager of the Seattle branch of the Studebaker Corporation, has again entered the motor car field after an absence of 8 months, this time as manager of the motor car department of the Waterhouse Trading Co., Seattle, agent and distributor of the Garford truck and touring car.

Racine, Wis.—The Mitchell-Lewis Motor Co., of Racine, Wis., has sold its entire delivery, spring and mountain wagon business to the Staver Carriage Co., of Chicago. The department formerly devoted to the production of wagons of this class will be used for additions to the body, trim and paint shops of the motor car works.

Marshfield, Wis.—Orrin R. Hughes, Marshfield, Wis., state agent for the Garford and Flanders, with a branch at Milwaukee, Wis., has disposed of his garage and shops at Marshfield and will devote his attention exclusively to the selling of these cars in the wholesale and retail fields. The garage will be conducted by a new firm under the style of Hub City Auto Co., the principal owners being Robert Herrick and John MacDonald.

Toronto, Ont.—The Russell Motor Car Co. has installed in its local plant additional machinery, the total cost of which was $100,000.

Philadelphia, Pa.—Franklin E. Hodge will be placed in charge of the garage service and supply department of the new headquarters of the Automobile Club of Philadelphia, Twenty-third and Market streets, when opened.

Omaha, Neb.—The Omaha Auburn Auto Co. has moved into its new garage at Twenty-sixth and Farnam streets. It is a large one-story building, built especially for the company. The Cole Motor Co. has moved into the garage which the Omaha-Auburn Co. vacated, at Nineteenth and Farnam streets.

Columbus, O.—The Hudson Sales Co., 145 North Fourth street, closed contracts as distributor for the Hudson in twenty-two counties in central Ohio for 1913. The same concern will act as distributor for the American in sixteen counties in central Ohio. The same company will also act as local agent for the Buick in Franklin and Licking counties.

Winnipeg—Walter George Chater, manufacturer; Harry Anderson, manufacturer's agent; George Huntingdon Ross, barrister-at-law; Douglass Nicholson, student at law, and Harry Folliott Gyles, student-at-law, have been incorporated under the name of the Tudhope Automobiles, Ltd., for the purpose of engaging in the motor car business. The company is capitalized at $60,000 with chief place of business at Winnipeg.

Detroit, Mich.—The Hupp Motor Co. has leased the large show room at the corner of Woodward and Willis avenues, originally leased by the Cole Motor Co., of Indianapolis. This company placed its car in an agency which occupies the former quarters of the Oakland company and has sublet the corner to the Hupp company for a term of years.

Detroit, Mich.—W. C. Anderson, of the Ford Motor Co., has gone to Minneapolis where quarters for a large assembling plant has been located temporarily while a great building is being erected. Work on this building will start immediately and it will take 9 months to complete. The Ford company plans to assemble 10,000 cars at this point for 1913.

Detroit, Mich.—H. N. Dunbar, formerly with the King Motor Car Co., has taken a position with the Ford Motor Co., with which concern he was associated some 6 years ago. He later left the Ford company to go with the H. H. Franklin Mfg. Co., coming to Detroit at the time of the organization of the King company, assuming the position of sales manager.

Lynn, Mass.—Elmer E. Bray, vice-president of the Lynn Automobile Dealers Association, has retired from the motor business. He intends to take a trip around the world, and on his return probably accept a position with a large company in New York. Sibley & Green, owners of the Liberty garage, have succeeded him in the motor business and they will carry

on the garage as well as take the agency for the Studebaker and Hudson cars and Chase and White trucks.

Athens, N. Y.—Plans are being made for the reconstruction of the Athens Motor Co.'s garage, which was burned down last week.

Omaha, Neb.—P. R. Day, recently assistant sales manager of the Empire Co. of Indianapolis, is now with the Oldsmobile Co. of Omaha.

San Francisco, Cal.—The Frank O. Renstrom Co., of San Francisco, has taken over the agency for the Regal cars in all of northern California and the state of Nevada.

Columbus, O.—The Resilio Tire Filling Co. is the name of a new concern which has opened a salesroom and shop at 115 North Wall street, to fill tires by a patented process.

Detroit, Mich.—George N. Matheson, for many years purchasing agent for the National Motor Vehicle Co., Indianapolis, has become purchasing agent for the Hayes Mfg. Co.

Kansas City, Mo.—A new company has been organized to handle the Cole in this city. J. H. Runcie and H. J. Clark compose the new company, which is to be known as the Cole Motor Co.

Syracuse, N. Y.—Edward P. Young, formerly a dealer of St. Catharines, Ont., has taken the agency of the Flanders six in this territory and has opened a salesroom at 694 South Salina street.

South Bend, Ind.—Harry Stillman, formerly an engineer with the Olds Motor Works, Lansing, Mich., has succeeded George Salzman, factory superintendent of the Amplex Motor Car Co., of Mishawaka, Ind.

Detroit, Mich.—Fred W. Thomas, for many years connected with H. A. Lozier & Co. when that concern was manufacturing Cleveland bicycles and more recently general traveling representative of the E. R. Thomas Motor Car Co., has been appointed special traveling representative of the Lozier Motor Co. in New York and Pennsylvania. Mr. Thomas succeeds W. L. Davis formerly eastern traveling representative of the Lozier Motor Co.

Minneapolis, Minn.—J. W. Martin, manager of the Oakland Motor Co. branch, 1518 Hennepin avenue, has opened a branch at Main and Sixth streets, St. Paul. It will be in charge of C. P. Berg Lund.

Kansas City, Mo.—E. J. Kilborn, former manager of the local Mitchell branch and who has joined the General Motors staff, has been succeeded by S. J. Horner and E. C. Byers, formerly of the Philadelphia branch.

Detroit, Mich.—J. R. Thibedeau, formerly connected with the purchasing department of the Abbott Motor Co., has been made assistant manager of the technical and service department of the same company.

Boston, Mass.—George Tolman and Edward H. Houtz have formed the Massachusetts Automobile Clearing House with headquarters at 108-110 Massachusetts avenue. They have arranged with a number of the local dealers to handle the second-hand cars taken in trade.

Columbus, O.—The Coats Motor Car Co., is the name of a new concern located at 215 North Fourth street, which handles the Commercial trucks and the Century Electric pleasure cars in central Ohio. A. B. Coats, formerly with the Columbus Dry Goods Co., is manager of the concern.

Minneapolis, Minn.—The O. Fenstermacher Co. has been incorporated with $300,000 capital. The company will handle supplies. Mr. Fenstermacher is agent for the Firestone tires. Incorporators of the company are: O. Fenstermacher, T. O. Fenstermacher and Fred Chambers.

Milwaukee, Wis.—Coerper Brothers, of Milwaukee, have awarded contracts for the construction of a $20,000 garage on Grand avenue between Twenty-seventh and Twenty-eighth streets. It will be 60 by 120 feet in size and two stories high. Coerper Brothers are the third to invade the exclusive Grand avenue residence district, the other firms which are building in the vicinity being the Packard Motor Car Co. and the W. E. Allen Co.

Moose Jaw, Sask.—The first motor car factory in western Canada will be located here. The St. Louis Car Co. will employ 100 men and turn out an all-Canadian car.

Syracuse, N. Y.—The Genesee Motor Car Co. announces the establishment of a new service station for Cadillac car owners at 345 W. Jefferson street adjoining the Chase motor truck service station.

San Francisco, Cal.—Walter Nelson Hunt, formerly of San Francisco, is now manager of the Sacramento branch of the Pacific Motor Car Co., agent for Stevens-Duryea, Woods electric and Cole cars.

Milford, Mass.—William H. Baker, owner of the Milford garage, has become the Worcester county agent for the Oakland car. He has opened another station and garage at 36 Central street, Worcester.

Gardner, Mass.—The Brown-Rawson Garage Co. has moved into the Knowlton building that has been renovated for its use and it has the agency now for the Metz, Jackson and Nyberg cars and Essenkay tire filler.

Boston, Mass.—F. B. Wilcox, who has the Lippard-Stewart truck and the Schacht car in Boston, has secured salesrooms at 34 Merchant's row, which is in the down town business section, far removed from the motor colony.

Springfield, O.—Frank R. Talbott has become affiliated with the Victor Rubber Co., of Springfield, O. Frank B. Patrick also has accepted a position with the same company and will be in charge of the advertising department.

Detroit, Mich.—J. P. Winterson, formerly connected with the eastern sales department of the Lozier Motor Co., in New York City, has been appointed special traveling representative for that company to cover territory in the southwest. Mr. Winterson will travel through the states of Colorado, Kansas, Missouri, Arkansas, Texas, Oklahoma, New Mexico and Louisiana.

Recent Agencies Appointed by Truck Manufacturers

Towns—	Agent	Car
Albany, N. Y.	Simmons-Newell Auto Co.	Chase
Albany, N. Y.	Robert F. Payne	Velie
Auburn, Cal.	H. W. Davis	Federal
Augusta, Ga.	Lombard Iron Works & Supply Co.	Federal
Bakersfield, Cal.	Ben L. Brundage	Federal
Cent'l V'l'ge, Conn.	U. LaFrance	Federal
Chattanooga, Tenn.	L. S. Mitchell Auto Co.	Federal
Columbus, O.	O. G. Roberts & Co.	Gramm
Dayton, O.	S. C. Crane	Franklin
Elyria, O.	Edward E. Critz	Sanford
Evanston, Ill.	George C. Foster & Co.	Federal
Hammond, Ind.	E. C. Minas & Co.	Federal
Jamestown, N. Y.	Edwin Wells	Federal
Kansas City, Mo.	Southwest Motor Car Co.	Detroiter
Kansas City, Mo.	Holker & Elberg	Peerless
Lynn, Mass.	Sibley & Green	White
Lynn, Mass.	Sibley & Green	Chase
Manassas, Va.	F. A. Cockrell & Co.	Sanford
Monticello, Ky.	G. O. Bassett	Federal
Montreal, Que.	Francis Hankin & Co.	Sanford
New Haven, Conn.	Alling Garage Co.	Federal
Norwich, Conn.	F. O. Cunningham	Sanford
Petaluma, Cal.	Joseph Peoples	Federal
Phoenix, Ariz.	Wesley Hill Garage	Federal
Richmond, Va.	Oakland Auto Co.	Federal
Rochester, N. Y.	J. Cunningham	Federal
Sacramento, Cal.	J. D. Lauppe	Federal
Schenectady, N. Y.	Sterling Garage	Federal
San Diego, Cal.	D. M. Price	Sanford
Springfield, Mass.	Dunbar Motor Co.	Krebs
Stockton, Cal.	Sampson Iron Works	Federal
St. Charles, Ill.	C. S. McCornack	Federal
Syracuse, N. Y.	T. A. Reed & Co.	Standard
Syracuse, N. Y.	A. J. Jackson	Federal
St. Louis, Mo.	Allen Baker	Dayton
St. Louis, Mo.	Federal Truck Co.	Federal
Traverse Cy, Mich.	Traverse City Iron Works	Federal
Pueblo, Colo.	Ideal Motor Car Co.	Federal
Toronto, Ont.	Central Garage & Supply Co.	Federal
Vancouver, B. C.	H. J. Tucker	Federal
Victoria, Vanc. Is.	Vancouver Isle Motor Co.	Federal
Washington, D. C.	Louis Hartig	Federal
Watsonville, Cal.	H. G. Brewington Co.	Federal

The Mathematics of Motoring

Lamps and Battery Sizes

WHEN the motorist decides to equip his car for electric lights the first question that presents itself is whether to use a storage battery alone or a lighting generator with it to furnish the power. Of course the battery alone is the simpler and cheaper, but has the disadvantage of needing frequent recharging if the lamps are used much, while the more complicated generator system is self-charging.

To consider for the time being only the simpler equipment, that of battery, lamps and the necessary wiring, the motorist is at once confronted with two questions, the size of lamps and the size of the battery. The only widely used voltage is 6 volts, and it is well to adhere to this standard, as replacements can be more easily obtained. Inasmuch as the capacity of the battery depends upon the number and size of the lamps used, which means the current output of the battery, the size of the lamps is the first thing to be decided.

There are only three size bulbs now in general use for headlight work, those being respectively 16, 21 and 25-candle power. For small motor cars which travel at comparatively slow speed, and where the owners would be satisfied with light that, while better than acetylene lights usually supplied with these small cars, is still not the most powerful, and where he will not be liable to compare his light with those of friends who have higher power to the detriment of the 16-candle power lamps, 16-candle power is undoubtedly ample. On the higher-powered cars the 21-candle power bulbs are in almost universal use today. These will give an ample light for driving up to a speed of 40 miles an hour at night, illuminating the road far enough ahead so that any object may be observed in time to stop almost as well as in the daylight, and in fact gives all the light that is needed.

Such lamps when used with a shallow parabolic reflector will light a road 50 feet wide for the full width of the road from the front of the car to a point over one-quarter mile away. A deep parabola of the same focus will light the road even further, but will not give as much light at the sides close to the car. Where extremely high-powered cars are used running at very high speed and where very large reflectors can be used, 25-candle power bulbs are sometimes employed.

It must be realized that with small reflectors built to take a 16-candle power bulb, the insertion of a 21-candle power bulb will not give the proportionate larger amount of light on the road that 21 is to 16, and similarly a 25-candle power bulb in a reflector built for 21-candle power will not give sufficient additional light to warrant its use.

The reflector should be adapted for the particular size bulb to be used, and for this reason there is little use in using large candle power bulbs in small reflectors.

With a commercial reflector having the greatest diameter of 8 inches, a 16-candle power bulb is about all that can be economically focused. With one of 10 inches diameter a 21-candle power bulb should be used, and there is little use in using a bulb larger than 21-candle power unless you have a 12-inch reflector.

We can therefore safely assume that the bulbs to be chosen for the headlights will be of 21-candle power, these being almost universal for cars of over 25-horse power today.

The side lamps and rear lamps are signal lamps only, and for these bulbs of small candle power can be used. Four candle power or 2-candle power bulbs are adequate, and it is customary to use 4-candle power side lights, and 2-candle power rear lights. The amount of current taken by these side and rear lights is so small that there is no objection to using 4-candle power bulbs for all three, or 2-candle power for all three, but the desirability of having a brilliant light at the side, for appearance, has led to the use of 4-candle power bulbs. Frosting these bulbs in the side lights gives a very pleasing appearance.

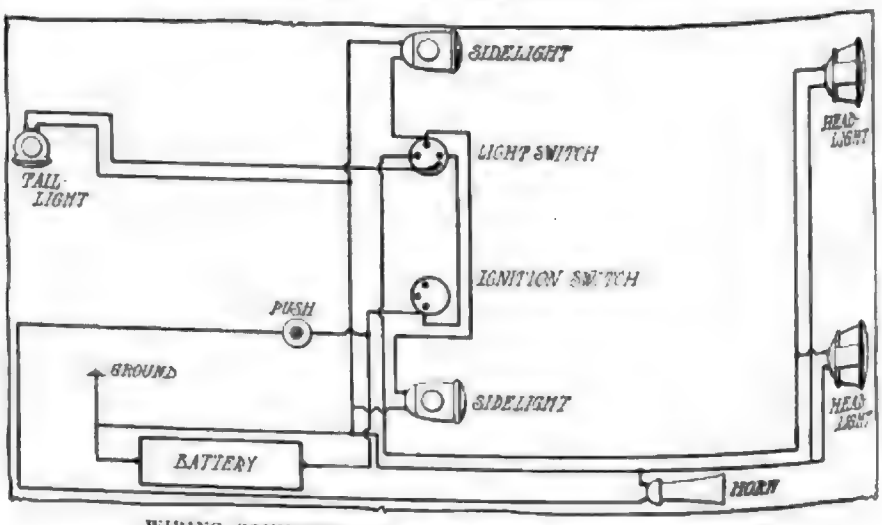
In addition to the heads, sides and rear, the car will probably be equipped with such current consuming devices as a speedometer light and electric horn, very possibly a cigar lighter, in the tonneau or limousine, and similar lights. None of these lights, however, is used for a very long period of time, and in designing the balance of the system after having decided on the five main lamps it may be safely assumed that the overload capacity of the outfit will take care of these additional loads for a short time.

We can assume, therefore, that the lamp load on an ordinary car should be: two 21-candle power headlights, two 4-candle power side lights and a 2-candle power rear light. The two headlights will take 7 amperes, the two side lights 1.7 ampere, the rear light .6 ampere, making a total lighting load of 9.3 amperes.

If for the sake of convenience in calculation, we allow a rather high figure for wiring loss, we may say that the current drawn from the battery is 10 amperes with the lights all on. Batteries are rated by their ampere-hour capacity which means the number of hours they can supply a given number of amperes current without recharging. The capacity is the product of the current supplied by the number of hours it can supply that current. For instance an 80 ampere-hour battery can supply our 10-ampere load for approximately 8 hours; it could furnish 5 amperes for 20 hours without recharging.

A battery of 80 ampere-hours capacity would hardly be large enough because it would need to be recharged too often although many of these are used. If the lamps are as large as those assumed, it is better to install a 120 or 160 ampere-hour battery. The former would carry the full load for 12 hours and the latter for 16 hours.

For the sake of the battery be sure to get a special lighting battery and not an ignition battery as the latter is quite likely to be ruined and will not give as good results.



WIRING CONNECTIONS FOR BATTERY LIGHTING SYSTEM

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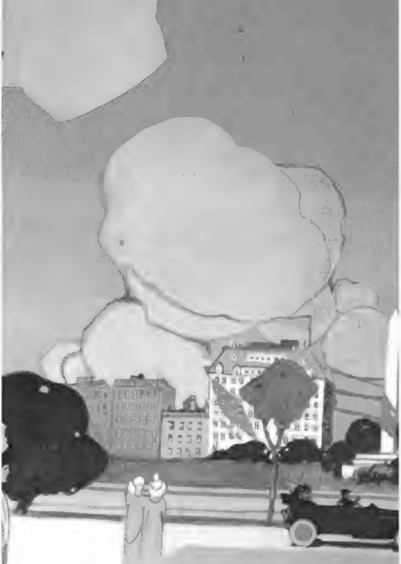
OTOR AG

CHICAGO, OCTOBER 10, 1912



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MOTOR AGE

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Volume XXII OCTOBER 10, 1912 No. 15

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MOTOR AGE

Grand Prix Honors Captured by Bragg

BRAGG CHASING BERGDOLL

ON CITY LIMITS TURN

BRAGG, WINNER OF GRAND PRIX

Fiat Driver Leads Benz and Stutz in American Classic at Milwaukee — Winning Average, 69.3 Miles per Hour

Masons Win in Both Pabst and Wisconsin Challenge Races—Crowd on Saturday Numbers 100,000—De Palma Injured

By C. G. Sinsabaugh

MILWAUKEE, WIS., Oct. 6—Running off the Vanderbilt last Wednesday, which returned Ralph de Palma in the Mercedes as winner, the Milwaukee Automobile Dealers' Association brought it's meet to a successful completion yesterday afternoon when the grand prix was run and won by Caleb Bragg in a Fiat at an average of 69.3 miles per hour. The two small-car races on Thursday were lacking in interest. Mortimer Roberts in a Mason winning the Pabst and Harry Endicott in a Mason taking the Wisconsin cup.

They had to coax Bragg to drive in the grand prix. On Wednesday he had announced his withdrawal from the classic out of respect to his friend, the late David Bruce-Brown, who was killed in practice Tuesday, but yesterday morning he could not resist the fascination of the big race and the entreaties of his team mates and so he was one of the twelve who lined up for the fourth running of the Automobile Club of America's gold cup race at approximately 410 miles.

Cold type fails when it comes to describing the grand prix finish. The tables show that Bragg had 15 minutes 24 seconds over the second car, the Benz driven by Bergdoll; but they do not show how close Ralph de Palma, winner this year of the two big races at Elgin and the Vanderbilt cup, came to snatching away from Bragg the international honors that now are his. Neither do they tell of how this same de Palma flirted with death and how lucky he was that his fate

BRAGG, BERGDOLL AND ANDERSON, ONE, TWO, THREE IN GRAND PRIX

CARS LINED UP FOR GRAND PRIX—BURMAN'S BENZ AND LOZIER IN FOREGROUND

FINISH OF BERGDOLL IN BENZ

was not similar to that which robbed the motor world of Bruce-Brown. As a result of the daring attempt which he made to add to his laurel wreath, de Palma now is in the Trinity hospital in this city, suffering from abdominal injuries which will confine him to his bed for a week or more. On the final lap de Palma ran into Bragg from the rear, his Mercedes turned over, throwing out both driver and mechanician, and poor de Palma saw even his chances of getting second go glimmering much as they went at Indianapolis in the 500-mile race.

With de Palma eliminated in this sensational manner, Bergdoll in the Benz ran into second place after a hot finish with Anderson in the Stutz, whom he beat by 41 seconds for the position, while Barney Oldfield, in a Fiat, was fourth, 4 minutes 52 seconds back of Anderson. Clark in a Mercedes and Burman driving Horan's Benz were still running when the race was called off, because of the crew refusing to be held in check any longer. Twelve cars in all started in the race, but half of them were eliminated for one reason or another.

But it was the Bragg-de Palma finish that stirred the crowd of 150,000 to a frenzy and the accident at the eleventh hour undoubtedly robbed the motoring public of the greatest finish that ever had been put up in a grand prix race. Bragg always had been a factor in the race, never being worse than third and having led the field from the thirty-first lap when Tetzlaff went to the side lines for keeps. De Palma had been plugging grimly, fifth and sixth at the start, then going up to third, then second and finally leading in the twenty-second, twenty-third and twenty-fourth laps, then dropping to third for four laps when Tetzlaff and Bragg were battling ahead of them and finally

OFFICIAL RESULTS IN FOURTH ANNUAL GRAND PRIX AT MILWAUKEE AS RECORDED BY THE WARNER ELECTRICAL

Fiat	Elapsed time	[illegible]
	Lap time	[illegible]
Benz	Elapsed time	[illegible]
	Lap time	[illegible]
Stutz	Elapsed time	[illegible]
	Lap time	[illegible]
Fiat	Elapsed time	[illegible]
	Lap time	[illegible]
Mercedes	Elapsed time	[illegible]
	Lap time	[illegible]
[illegible]	Elapsed time	[illegible]
	Lap time	[illegible]
Mercedes	Elapsed time	[illegible]
	Lap time	[illegible]
Fiat	Elapsed time	[illegible]
	Lap time	[illegible]
Lozier	Elapsed time	[illegible]
	Lap time	[illegible]
Mercer	Elapsed time	[illegible]
	Lap time	[illegible]
Mercedes	Elapsed time	[illegible]
	Lap time	[illegible]
[illegible]	Elapsed time	[illegible]
	Lap time	[illegible]

[illegible] Wishart, 21. Burman

BRAGG GETS FLAG THAT DECLARES HIM WINNER OF THE FOURTH GRAND PRIX

FINISH OF ANDERSON IN STUTZ

becoming runner-up to Bragg when Tetzlaff went out.

With four laps to go, de Palma was 4 minutes 19 seconds to the bad. He made a lap in 6:28 to Bragg's 7:21 and cut the margin to 3 minutes 26 seconds. The fiftieth lap was made in 6:36 by de Palma and 7:26 by Bragg and the gap was reduced to 2 minutes 36 seconds when Starter Wagner waved his green flag for both of them. De Palma was chasing his rival with deadly intensity and upon receiving a signal from his pit to "beat it" he stepped on the throttle and had the accelerator flat with the boards when he swung onto the North Fond du Lac road. He crept up on the Fiat with great leaps and bounds and at station 11 he had caught his rival. But it was necessary for him to do more than catch him—he had to pass and beat him to the tape by the margin that Bragg had over him at the start.

Bragg 41.

Then came the thriller that spoiled the finish. De Palma was trying to pass and some say that just as he crept up to the rear wheel of the Fiat Bragg swung over a trifle and the gray Mercedes ran into the rear of the red car.

The Bragg-de Palma battle was the real feature of the race, although Tetzlaff's efforts earlier in the contest stirred the crowd to enthusiasm. Outside of these two incidents, the running of the Stutz, which finished third, was commendable.

A crowd estimated at 100,000 saw the race, but at that the promoters lost money—probably $25,000. It is admitted a mistake was made in not dividing with the farmers as was done at Elgin, which resulted in the property owners letting in thousands who did not pay any admission fee. At that Milwaukee wants to run both the classics next year.

TIMER, SHOWING HOW CALEB BRAGG. IN A FIAT WON THE AMERICAN CLASSIC AT A SPEED OF 69.3 MILES PER HOUR

27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52		
212 miles 4326 feet	220 miles 3704 feet	228 miles 3082 feet	236 miles 2460 feet	244 miles 1838 feet	252 miles 1216 feet	260 miles 594 feet	267 miles 5252 feet	275 miles 4630 feet	283 miles 4008 feet	291 miles 3386 feet	299 miles 2764 feet	307 miles 2142 feet	315 miles 1520 feet	323 miles 898 feet	331 miles 276 feet	338 miles 4934 feet	346 miles 4312 feet	354 miles 3690 feet	362 miles 3068 feet	370 miles 2446 feet	378 miles 1824 feet	386 miles 1202 feet	394 miles 580 feet	401 miles 5235 feet	409 miles 4616 feet	Position at finish	Miles per hour
180 41	187 21	194 00	200 34	207.04	213.40	220.17	227 02	233 32	240 02	251 38	258.23	265 07	272.01	279 02	286.05	293 11	300:42	307.53	315.16	322.33	329 54	337.17	344 38	352:04	359.27.44	1	69.3
6 41	6:40	6 33	6.34	6.30	6.36	6 37	6:45	6 30	6:30	11:36	6.45	6.44	6:54	7 01	7.03	7 06	7 31	7 11	7:23	7 17	7:21	7 23	7 21	7 26	7.22		
192 22	200.36	208.39	215 12	221 57	229 38	235 13	241 58	248 40	255 20	265 01	273.22	280:11	287 09	294 14	301 25	308 37	316.06	326:26	333 32	340:39	347 37	354:31	361 14	368:00	374 58 36	2	65.5
10 29	7.04	8.03	6 43	6 46	7.21	6 41	6:45	6 42	6:40	9 41	8 21	6.49	6:58	7 05	7:11	7 12	7.29	10:20	7 06	7 07	6.58	6:54	6:43	6:46	6 58		
191 10	201:40	208 56	216.04	223.11	230 19	237 23	244.28	251 35	258.41	265.49	272:56	280:08	287.27	294 55	301:42	308:53	316.05	323 15	330 21	337:32	344 43	351:55	359:22	367:51	375 22.47	3	65.4
7 37	10 30	7:16	7.08	7.07	7 08	7 04	7.05	7 07	7:06	7:08	7:07	7:12	7:19	7 28	6 47	8 11	10:12	7:10	7:06	7:11	7 11	7:12	7:27	8:29	7 21		
198:27	205.42	210 52	219 29	226 44	233 33	243.39	250:37	257 36	264 34	277 40	284 13	291 24	298.16	304.55	311 45	318:39	325:39	332 18	338.54	345.24	351:58	358:52	365:45	372.49	379 54.60	4	61.8
7.31	7 15	7 16	8.37	7 15	6 49	10 06	6 18	6 59	6 58	13:06	6 33	7 11	6 52	6:39	6:50	6:54	7 00	6 39	6 36	6.30	6 34	6.54	6.53	7:04	7:06		
203 31	210.50	218:17	225 45	233 12	240 29	247 53	265 23	273 53	281 58	292 02	299:29	307.01	314 30	322 03	329 33	337:03	344 35	352:02	359 25	367 17	375 01	382 45	391.06	Flagged			
7 36	7 19	7:27	7:28	7 27	7.17	7:24	9 30	8 30	8 05	10 04	7.27	7.32	7 29	7:33	7 30	7:30	7:32	7:27	7:23	7:52	7 44	7:44	8 21				
211.55	218 43	225 36	232 48	252 54	259 57	267 05	274.22	281 37	291.56	298.34	305 09	313 34	320 19	327.02	334.02	341 10	349 31	358 34	369:08	378 08	Flagged						
6 51	6.48	6 53	7 12	20 06	7 03	7 08	7 13	7 15	10 19	6.38	6.35	8 25	6 54	6 43	7:00	7:08	8 21	9 03	10 35	9 00							
189 52	196 37	203 08	209 39	216 11	222 43	229 13	235 38	242 04	250 25	259 36	263 12	273 21	280 05	286 40	293.11	299:54	307:56	314 54	321:40	328 18	335.05	341:36	348:04	354 46	Out		
12 04	6:45	6 31	7 31	6 32	6 32	6 30	6.25	6:36	8:21	9:11	13 36	10 09	6.44	6:35	6 31	6 43	8 02	6 58	6 46	6 38	6.47	6:31	6:28	14 38			
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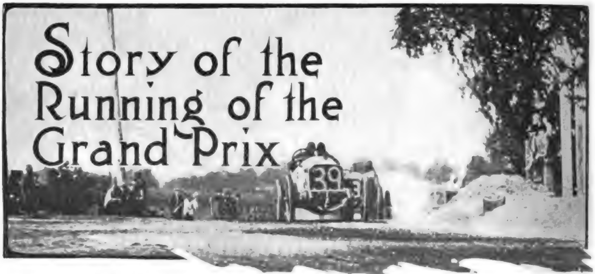
6 20	6 31	6 40	6 40																								

Story of the Running of the Grand Prix



REMARKABLE PICTURE SHOWING CLARK ANDERSON AND HORAN TAKING THE CITY LIMITS TURN AFTER SPRINT

By L. V. Spencer

THE grand prix, which is an international event, and which is run under the sanction of the Automobile Club of America and not under the rules of the American Automobile Association, took place on Saturday before a crowd which was well over 100,000 strong, according to the official figures. Fully 10,000 people, which vast assemblage completely filled the immense grandstand, witnessed the finish of Caleb Bragg in his Fiat, who crossed the line, winner of the fourth annual race, averaging 69.3 miles an hour for the distance of about 410 miles, or fifty-two laps.

On the fifty-first round, Bragg was well ahead of de Palma who was running second, and who surely would have come in second, had he not met with accident almost on the eve of the finish. At the end of the fifty-first lap, Bragg was leading de Palma by 2 minutes 36 seconds, yet the latter determined to cut this down so that the balance would be on the other side of the ledger, if possible. On his fifty-first round, de Palma received instructions from the pit to speed up. Desperate, he drove like mad, taking the turns at a fearful clip. The crowd was all excitement, for there was a chance that the young Italian would win.

De Palma is Ditched

But just before Bragg arrived at the tape, the report came in without details that de Palma was in the ditch. None of those who heard the report was surprised, for all knew that de Palma was going at a fearful rate. The announcement was not given out to the crowd for fear of a stampede, and none suspected that an accident had happened until after Bragg had crossed the line the winner, running slowly. He stopped at the line and conversed with Starter Wagner, telling him all he knew of the accident. Yet the crowd did not suspect for several seconds; when it dawned upon them, cries of "Where is de Palma?" "What has become of de Palma?" arose from the crowd. Still the news was kept quiet, and delivered only to the press stand, and was not given out until the race was over.

At station 11, which is on the North Fond Du Lac road, de Palma attempted to pass Bragg, but did not allow enough room to clear the other car, hitting the big Fiat with sufficient force to overturn his speeding Mercedes, throwing him and his mechanician Tom Alley out of the car. Their injuries, at first thought to be serious, did not prove so grave.

Throughout the long run of 410 miles there was plenty of excitement for the big crowd. There was an imposing line up of high-powered cars at the start. Out of the fourteen entries, there were twelve starters. One of those missing was Bruce-Brown, while the other was Mulford, whose Knox was not in shape for the race. Barney Oldfield was also on hand, having succeeded in getting a car—a Fiat—at the last minute.

Start of Grand Prix

Bob Burman, in Benz 31, was the first to get away, followed by Fontaine in a Lozier. Fontaine is a Milwaukee pilot, and he drove the same car which Nelson,

E. J. SCHROEDER, OWNER OF MERCEDES DE PALMA PILOTS AND GREAT DRIVER WHO WON ELGIN RACES AND VANDERBILT CUP

GIL ANDERSON IN STUTZ, ONLY AMERICAN CAR TO FINISH IN THE GRAND PRIX

its owner and entrant, drove in the Vanderbilt cup race of Wednesday. Next came Teddy Tetzlaff, demon driver of them all, at the wheel of Fiat 33. He was trailed by Hughie Hughes in the sturdy Mercer. The unlucky de Palma was off 30 seconds later in his Mercedes 35. Spencer Wishart, who drove a Mercer in the Pabst race of Friday, was in command of another Mercedes, No. 36. Clark was next off in Mercedes 39. Bergdoll, at the wheel of the immense Benz 40 followed. After him was Bragg, Fiat 41, who had withdrawn from the race following Bruce-Brown's death, but who was persuaded at the last minute to compete. Benz 42, which was scheduled to be driven by Joe Dawson, winner at Indianapolis in June, was sent away by Horan instead. Gil Anderson in the Stutz, which looked small beside the immense foreign machines, got the word next, and last Oldfield in Fiat 44.

Tetzlaff in Lead

Tetzlaff took the lead in the first lap, with Bragg second and Bergdoll third. Wishart and de Palma were in fourth and fifth places, respectively, while the others came around in the following order: Burman, Hughes, Horan, Anderson, Fontaine, Clark and Oldfield. The latter would no doubt have shown up better on this first circuit had he not been delayed by tire trouble. This was the first stop at the pits.

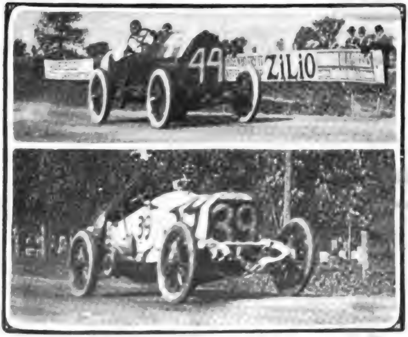
Returning to the race, the second lap saw only two shiftings of positions among the cars in the rear positions. Wishart took Bergdoll's place in third position, while Hughes overtook Burman, forcing the latter into seventh position and putting Hughes in sixth. All this time Tetzlaff was driving in his terrific, slam-bang style, much the same as he did in the Vanderbilt race of Wednesday. After completing his second lap, Burman stopped at the pit with engine trouble, the same trouble, by the way, which delayed the start of the race for 10 minutes. In his third lap, Burman was permanently out of the race, his Benz having succumbed to a broken piston.

Racers Shift Positions

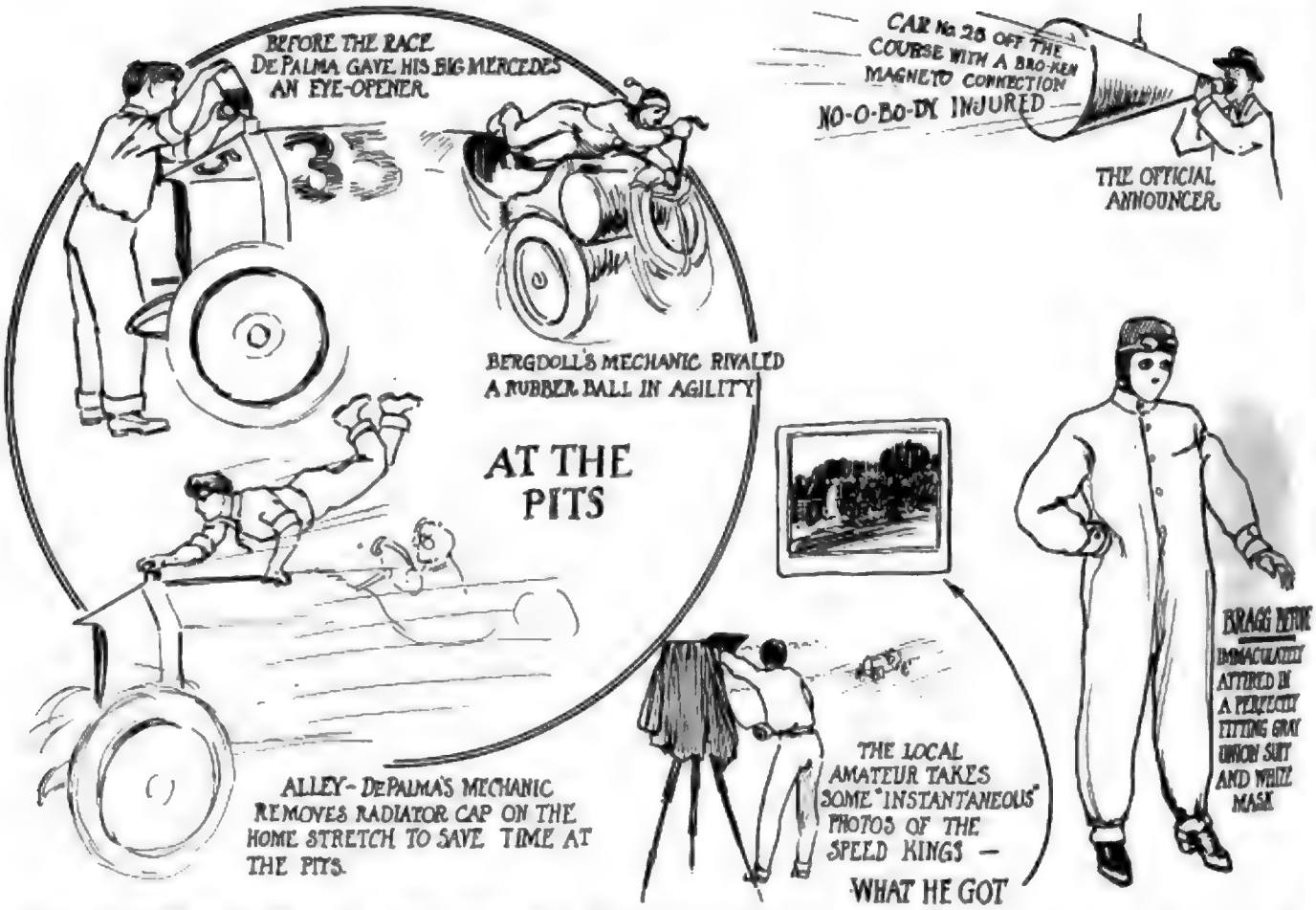
Burman out, Anderson came from ninth into seventh place, Hughes, who had to stop at his pit on his third lap to replace a spark plug, went back to last place at the end of the third. The shift brought Clark up to tenth, Oldfield having passed him and coming into the ninth place. Fontaine was running now in eighth place, while Horan became sixth. The leaders retained the same positions which they had held during the second lap.

The third was Wishart's last lap; in the fourth his motor was disabled with a broken crankshaft, a break which presages quick repair. Bergdoll now became third, while de Palma moved up to fourth place. Horan succeeded to fifth place, Anderson to sixth, Fountaine to seventh, Oldfield to eighth, Clark to ninth and Hughes to tenth. Tetzlaff, way in the lead, was reeling off the miles at a lively clip. There seemed to be no stopping him. clip with Bragg a good second.

The fifth lap saw no changes in the positions of the leaders, the only difference in the ten contenders being that



BARNEY OLDFIELD IN FIAT WHO FINISHED FOURTH; GEORGE CLARK IN MERCEDES, WHO WAS GIVEN FIFTH PLACE



both Anderson and Fountaine passed Horan. The Stutz car came into Horan's old position at fifth, while the Lozier came up to sixth place.

In the sixth lap, Clark passed Oldfield, who was obliged to stop at his pit to replace a right rear tire. The veteran driver made quick work of the change, but he did not regain his lost position until the ninth lap. There was no other change in the line-up in the sixth lap, Tetzlaff still leading by a good margin and hotly pursued by Bragg, Bergdoll and de Palma.

De Palma Moves Up

It was in the seventh lap that de Palma snatched third place from Bergdoll, who stopped for fuel and an extra supply of tires to replace those used on the back stretch. This wait put Bergdoll back into sixth place, Fountaine and Anderson passing him as well as de Palma.

The eighth lap brought out no differences in the line-up, while in the ninth, the only position change was in Oldfield's taking eighth position from Clark. In this lap Fountaine went through the straw bales on the Fond du Lac road turn, but he was soon on the road again, no one having been hurt. The tenth saw no change except that Bergdoll, in the Benz, passed Fountaine.

In the eleventh, Tetzlaff made his first stop at the pit, thus giving his lead to Bragg, who was running nicely and whose car had performed so far without a hitch. Tetzlaff changed a right rear tire and was soon away again in pursuit of Bragg. In this lap, Horan, who had been running seventh, passed Anderson, Bergdoll and Fountain, and took fourth position momentarily, only to drop back to his old standing again on the following round. The Stutz car then took fifth place, Bergdoll sixth, and Fountaine seventh.

All this time de Palma was running third, and Anderson, except for the thirteenth lap when he was momentarily nosed out by Bergdoll, was in fourth position. In the fourteenth lap Bergdoll blew a tire on the back stretch at station 4 and the delay put the Benz entry into seventh position, both Oldfield and Fountain passing it. Hughes was still worrying along in last place.

The fourteenth lap was Tetzlaff's fastest, and also the fastest lap ever covered over the Wauwatosa course, he making the circuit in 6 minutes 7 seconds, or at the average speed of 77.4 miles an hour. This hitting it up gave Teddy the lead again, which he held through the next lap, Bragg running consistently and but a few seconds behind. On lap seventeen, Tetzlaff made a pit stop which cost him 2 minutes 22 seconds and putting Bragg in the lead.

At the end of the seventeenth lap, the cars stood Bragg, Tetzlaff, de Palma, Anderson, Bergdoll, Fountaine, Oldfield, Clark, Horan. The Mercer car 34, Hughie Hughes, went out for good in this lap, leaving only nine cars still running. Hughes' car was disabled by a broken gasoline line. Two laps previous to his withdrawal, Hughes' car threw a wheel at station 7, but the driver controlled the car, keeping it on the road. Another wheel was substituted, his car being equipped with the wire type.

Bragg Loses Lead

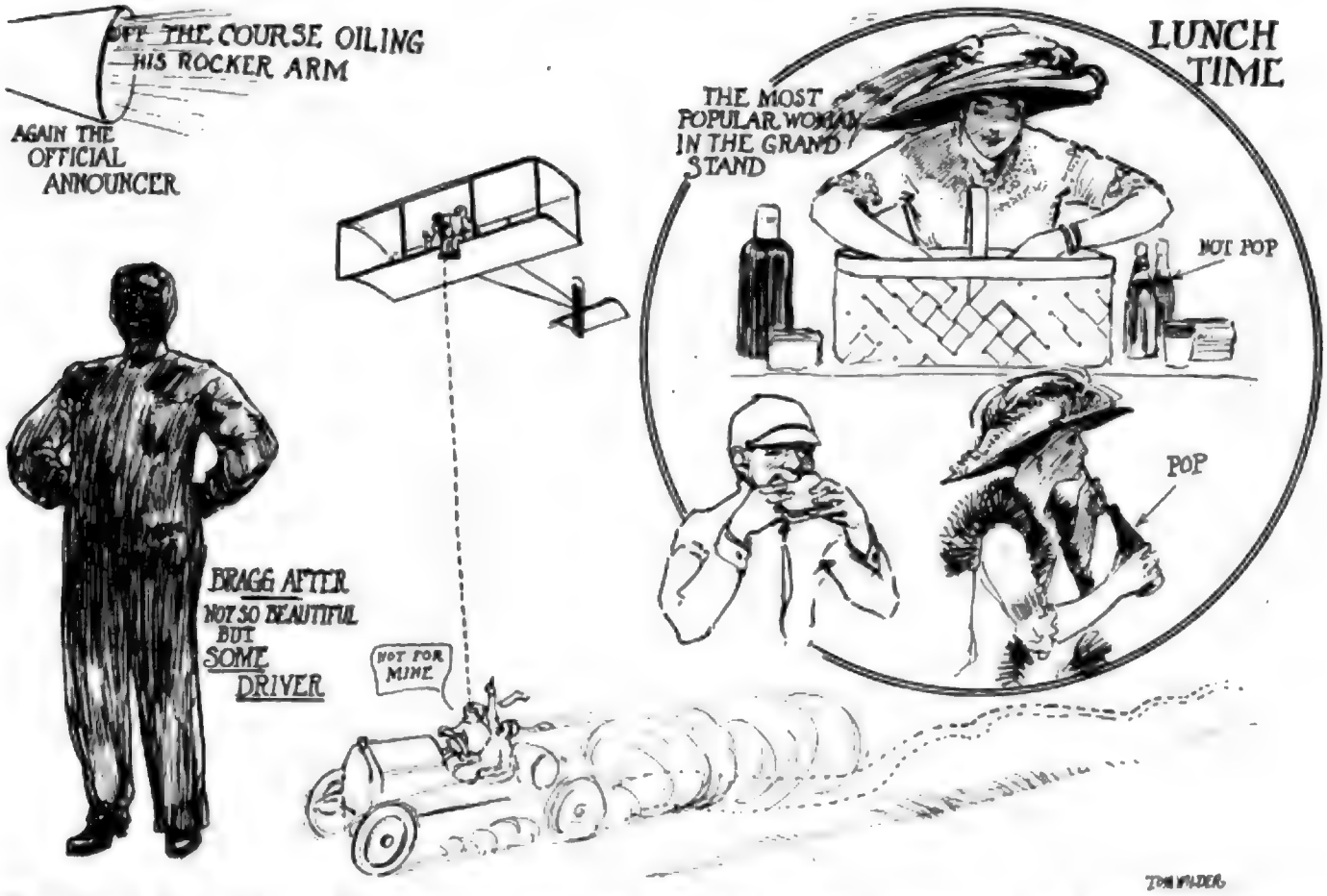
Through the twentieth lap, nothing of note took place, although on the next round Bragg lost his lead, which he had held from the seventeenth lap. He was obliged to stop at his pit for gasoline, and he changed both rear tires at the same time, losing in all 2 minutes. De Palma and Tetzlaff were both so close that they passed Bragg while he was stopped.

Tetzlaff also was forced to change a rear tire, so that, in the twenty-second circuit, de Palma was leading, with Tetzlaff second and Bragg still third. De Palma, now leading, had averaged 72 miles an hour for twenty-two laps.

De Palma retained the lead through the twenty-fourth lap with Tetzlaff second, Bragg third, Bergdoll fourth, Anderson fifth, Oldfield sixth, Clark seventh, and Horan eighth. But in the next lap, which was the twenty-fifth, Tetzlaff succeeded in nosing de Palma out of first position.

More delay at the pit on the twenty-sixth lap allowed Bragg to take second position from de Palma, while Tetzlaff was still in the lead.

In the thirty-first lap it was seen that something was wrong with Tetzlaff, who since he had regained the premier position



had been going at a lively pace. Finally, the car was seen coming down the track at a slow pace and it was found that Tetzlaff was permanently out of the race with a broken radius rod. With Tetzlaff's withdrawal, seven cars remained in the struggle, the Lozier having gone out in the twenty-second lap with a sprung steering-knuckle.

With Tetzlaff out Bragg came into first place again, de Palma second, Bergdoll third, Anderson fourth, Oldfield fifth, Clark sixth, and Horan seventh. The rest of the race for first place was simply a struggle between Bragg and de Palma.

CYLINDER SIZES AND EQUIPMENT OF THE CARS CONTESTING IN THE 3-DAY RACES AT MILWAUKEE

VANDERBILT CUP RACE

No.	Car	Driver	Bore	Stroke	Piston displacem't	Magneto	Carbureter	Shock Absorber	Tires	Oil	Spark plugs
22	Mercedes	DePalma	5.2	7.06	644.6	Bosch	Rayfield	Mercedes	Michelinn	Monogram	Bosch
23	Mercer	Hughes	4.39	5	309.0	Bosch	Rayfield	Hartford	Firestone	Monogram	Bosch
24	Knox	Mulford	4.8	5½	597.0	Bosch	Rayfield	Mondex	Michelinn	Olizum	Bosch
25	Lozier	Nelson	5⅜	6	549.0	Bosch	Rayfield	Mondex	Michelinn	Wadham	Bosch
26	Mercedes	Wishart	5¼	7.06	590.0	Bosch	Rayfield	Mondex	Michelinn	Monogram	Bosch
27	Stutz	Anderson	4⅜	5½	389.9	Splitdorf	Schebler	Hartford	Goodyear	Monogram	Bosch
28	Mercedes	Clark	5¼	7.06	590.0	Bosch	Rayfield	Mercedes	Michelinn	Mobiloil	Red Head
29	Fiat	Tetzlaff	5	6⅞	589.0	Bosch	Rayfield	Hartford	Miller	Olizum	Bosch

GRAND PRIZE RACE

31	Benz	Burman	...	...	...	Remy	Benz	...	Firestone	Olizum	Bosch
32	Lozier	Fontaine	5⅜	6	549.0	Bosch	Rayfield	Mondex	Michelinn	Wadham	Bosch
33	Fiat	Tetzlaff	5¼	7⅞	589.0	Bosch	Rayfield	Hartford	Miller	Olizum	Bosch
34	Mercer	Hughes	4.39	5	309.0	Bosch	Rayfield	Hartford	Firestone	Monogram	Bosch
35	Mercedes	DePalma	5.2	7.06	644.6	Bosch	Rayfield	Mercedes	Michelinn	Monogram	Bosch
36	Mercedes	Wishart	5¼	7.06	590.0	Bosch	Rayfield	Hartford	Michelinn	Monogram	Bosch
39	Mercedes	Clark	5¼	7.06	590.0	Bosch	Rayfield	Hartford	Michelinn	Mobiloil	Red Head
40	Benz	Bergdoll	6.2	6.3	670.0	Bosch	Benz	...	Fisk	Olizum	Bosch
41	Fiat	Bragg	5¼	7⅞	850.0	Bosch	Rayfield	Mondex	Michelinn	Monogram	Bosch
42	Benz	Horan	...	...	...	Bosch	Rayfield	...	Michelinn	Monogram	Bosch
43	Stutz	Anderson	4⅜	5½	389.0	Splitdorf	Schebler	Hartford	Goodyear	Monogram	Bosch
44	Fiat	Oldfield	5⅞	7⅞	850.0	Bosch	Rayfield	Mondex	Firestone	Olizum	Bosch

WISCONSIN MOTOR CHALLENGE TROPHY

2	Mason Special	Snyder	3⅞	5	235.8	Splitdorf	Schebler	Hartford	Michelinn	Olizum	...
3	Mason Special	Mason	3⅞	5	235.8	Splitdorf	Schebler	Hartford	Goodyear	Mobiloil	...
5	Mason Special	Endicott	3⅞	5	235.8	Splitdorf	Schebler	Mondex	Michelinn	Texaco	...

PABST BLUE RIBBON TROPHY

11	Case	Nikrent	4 23-64	5	447.8	Splitdorf	Rayfield	Mondex	Michelinn	Texaco	...
12	Bergdoll	Rooney	4	5½	401.5	Bosch	Rayfield	Hartford	Firestone	Texaco	Bosch
14	Mercer	Wishart	4.39	5	309.0	Bosch	Rayfield	Hartford	Firestone	Monogram	Bosch
15	Fal	Hastings	4⅛	5¼	280.6	Splitdorf	Schebler	Hartford	Michelinn	Polarine	...
16	Mason Special	Roberts	3⅞	5	235.8	Splitdorf	Schebler	Hartford	Michelinn	Olizum	Bosch
17	Mercer	Pullen	4⅜	5	300.7	Bosch	Rayfield	Hartford	Firestone	Monogram	...
18	Fal Special	Chandler	4⅛	5¼	280.6	Splitdorf	Rayfield	Hartford	Michelinn	Polarine	...
19	Mercer	Hughes	4.39	5	309.0	Bosch	Rayfield	Hartford	Firestone	Monogram	Bosch

The Mercers and the Stutz used wire wheels, the former Rudge-Whitworth and the latter McCue

Pit Work During the Grand Prix

ANDERSON WITH THE STUTZ AND DE PALMA WITH THE MERCEDES WERE EARLY ARRIVALS AT THE PITS

By Darwin S. Hatch

ANNUAL grand prix races are unique from the standpoint of the observer of the work at the pits as they are international events while the others are national events. They are run, therefore, under the rules of the Automobile Club of America instead of under the A. A. A. rules which govern the national contests. The A. C. A. rules do not permit the pit men to render any assistance on the track to the contestants. That is, the driver and his mechanic must do all the work that becomes necessary about the car during the race. They must make all tire changes, and fill oil, water and fuel tanks as well as perform the actual mechanical adjustments. In the national races, pit attendants are permitted to change tires and replenish the supplies so the driver and mechanic are left free to do the mechanical work at the pits.

Special Pit Rules

The fact that the drivers and their mechanics were forced to do all the work about the car resulted in the stops at the pits requiring more time than is usual and probably cut down the average speed of the race quite materially. On the whole, however, the cars got away from the pits in shorter time than was to be expected under the circumstances, for the contestants worked like demons to cut down the time of the enforced stops. The grandstands had a chance to see the acme of team work of driver and mechanic.

When it was necessary to take on another spare tire to replace one that had been used at some other point on the course, the cars would come in to the pits with the drivers slackening speed, while the mechanic was stretched over the tanks behind the seat unbuckling the straps that held on the spare tires and would have them loosened up ready to slap on the new spares before the car came to an abrupt stop. Several times cars came pounding down the stretch to the pits for water with the mechanic stretched full length over the hood, retaining his precarious position with one hand on the hood strap, while with the other removed the radiator cap.

Fast Work at Pits

The necessity for quick work at the pits resulted in several interesting arrangements for filling the fuel tanks. Bragg had the gasoline stored at his pit under pressure with a hose from the storage tank which was slipped into the fuel tank of his Fiat. Some of the others had small gasoline cans which could be up-ended into the tank without requiring a funnel. Two of the cars, the Stutz and Hughes' Mercer, were equipped with wire wheels in the hope of cutting down the number of tire changes and the time required to make them. Nor was any time lost in stopping and getting under way again, for the mechanic usually had leaped to the track before the car had come to a stop and nearly always had to make a flying leap to regain his seat after the driver had started.

There were in all thirty-eight stops at the pits, three of which were permanent. Of the thirty-five temporary halts, only six were for tire replacements alone, although in twenty of them advantage of the enforced stop for other causes was taken to replace worn tires or spares, or other things were done when tire changes became necessary. As may be expected, the majority of the tire changes were on the right rear wheel which has the hardest service.

Stutz Makes Long Non-Stop Run

Anderson with his Stutz holds the palm for the longest non-stop run of the day. He made only two stops during the entire 410 miles of the race and ran the first 215 miles without a halt. He had no mechanical trouble, and he changed but one tire throughout the race, replacing the demountable wheel on the left rear in the twenty-seventh lap. At the same time, he took on gasoline and oil. His only other stop was on the next to the last lap when he refilled his gasoline tank.

Like Anderson, Bragg made only two stops, the first one being after he had run 166 miles, when he changed both rear tires and took on gasoline and oil. His other stop was at the end of the thirty-seventh lap when he refilled his supply tanks and changed the left rear tire. Bergdoll made but four stops; the first one to take on gasoline and replace a spare tire which had been changed on the back stretch, getting away in 46 seconds. When the race was half over he lost 3 minutes and 40 seconds at the pits in changing tires, renewing his supplies and tightening up shock absorbers. After running 30 miles more he stopped 45 seconds to put a strap around the fuel tank which was beginning to work loose. He stopped again for gasoline and a spare tire in the thirty-eighth lap and in the forty-third to put on two rear tires.

Barney Oldfield started the ball rolling at the pits, when, after his first circuit of the track, he replaced a rear tire. He had

not gotten away when Burman pulled up after completing 15 miles and adjusted the valves of his engine. He had not had time to properly tune up the engine before the race, in fact the start had been delayed 10 minutes to give him a chance to get it in order. Hughes stopped in his third lap to change spark plugs and again in the fourth for the same purpose. Then there was a lull at the pits till Oldfield drew up for another tire change.

Horan's Mechanic Is Excited

Tetzlaff stopped twice for tires and fuel after running 80 miles. Before he got away, Horan pulled up to replace a spare and take on gasoline, but waited to change a right rear tire. He had started out when the shouts from his pit told him that the jack had been left in the track in the excitement, and the mechanic did a record-breaking sprint back to pick it up. Even at that, Horan was away in less than 2 minutes. When the race was two-thirds over Horan lost 6 valuable minutes, for Burman, who relieved him, by running in on the rim from the back stretch where he had blown a tire. This damaged the wheel so that it had to be replaced by one from Burman's Benz.

De Palma holds the record for rapid tire change, when at his first stop in the twenty-fifth lap he replaced a tire in 37 seconds. At the end of his next circuit of the course the Italian stopped again, this time to put oil on the rocker arms. After another 15 miles he halted again and worked at his motor for nearly 4 minutes, adjusting the valves and removed a magneto wire that had caught on the carbureter lever. His last stop was made in the thirty-seventh lap for tire and water.

The record of Clark's Mercedes is nearly as good as that of the Stutz. Clark made but two stops, the first one being after running 190 miles, when he took on gasoline and oil. His second and last stop occurred in the thirty-fifth circuit of the course when he lost over 10 minutes in repairing a leak in the water-cooling system. Clark was the most fortunate so far as tire troubles were concerned, as he did not change a tire throughout the race.

Of the cars finishing in Thursday's races the Falcar was the only one to finish without trouble of any kind. Not a stop was made at the pits by Hastings, even to fill his tanks. Wishart in the Mercer ran 110 miles without a stop till he went out for good. Robert's Mason special, the winner of the larger class, made one stop on account of a broken gas lead. This was repaired by putting in a piece of hose. When he started out again, the car stopped after a few yards because he had forgotten to turn on the gasoline again.

Endicott, the winner of the small-car race, made two stops, the first one after one circuit of the course when a spark plug was changed. The other stop was in the seventeenth lap for gasoline. Mason, driving the Mason No. 3, an old stripped touring car, held the record of the day for stops, making five during the 173 miles of the Wisconsin trophy contest.

There were eight stops at the pits in the Pabst trophy race, only two of them for tire troubles. There were only two cases of mechanical trouble to the cars that finished. The other stops being for fuel, water and oil. Of the eight stops in the small-car race, only two were made on account of tire trouble.

In general, Wednesday's race was remarkable for the lack of tire trouble encountered on such a new course and speaks well for the condition of the track. Although the early part of the race witnessed considerable tire trouble, the drivers settled down to a saner pace and their tires gave them more mileage during the latter portion of the contest. Of the thirty stops around the course, twenty-five of these were made at the pits and approximately half of them were caused by the necessity for tire replacement. What mechanical trouble developed was in nearly every case so serious as to put the contestant out of the race for good and all. These troubles are given in detail in last week's story of the event. Hughes was the first to make a stop, and this was when he changed a wheel at the pit. Mulford was held up on the back stretch on account of ignition trouble in the second lap. This caused another stop in the fifth lap ending in his withdrawal.

Pit Work Generally Good

The pit work as a whole, was very good, but was not to be compared for efficiency with that of the grand prix, considering the fact that in the latter, the drivers and mechanics had to do all of their own work. Much less time was lost at the pits than in the small car races of the day following. This was due to the better preparations and training of the pit men, and also to the fact that the drivers stopped their cars close to the pits, while the lighter cars on Thursday ran by their pit spaces, in a great many instances, and consumed much time in backing up to their proper position.

PIT SCENE BEFORE START OF GRAND PRIX, SHOWING BRAGG'S AND TETZLAFF'S FIATS

1

2

The Vanderbilt Cup

3

* * *

IN the issue of October 3 Motor Age told in detail of the running of the Vanderbilt cup race at Milwaukee October 2, story and tables being received by telegraph. Now Motor Age reproduces herewith interesting pictures of the struggle which returned as winner Ralph de Palma in the same Mercedes which he drove to victory at Elgin, winning the Chicago Automobile Club's Elgin trophy race and free-for-all. Illustrations on page 14 show **the following:**

1—Ralph de Palma, winner of the Vanderbilt

2—Starter Wagner giving de Palma the checkered flag, denoting the finish of the race

3—De Palma in Mercedes straightening up after **having made a turn**

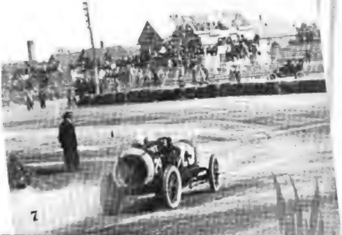
4—Cars lined up for the start of the Vanderbilt. No. 22 is de Palma's Mercedes and No. 23 Hughes Mercer

* * *

4

6

Told



7

Roberts in Mason Wins Pabst Trophy

Falcar Second and Third in 231-300 Displacement Class at Milwaukee

By L. V. Spencer

MORTIMER ROBERTS, WINNER OF PABST CUP

MILWAUKEE, WIS., Oct. 4—The small-car races which were run off today, were a sort of anticlimax to the big Vanderbilt cup classic of Wednesday. These races were the Pabst Blue Ribbon trophy race for twenty-eight laps or 220 miles, 3,704 feet, and the Wisconsin Motor Challenge trophy event, which is for a shorter distance of twenty-two laps, or 173 miles, 2,156 feet.

Mortimer Roberts, driving a Mason special, romped away with the longer run, while the Wisconsin Challenge went to Harry Endicott, also driving a Mason car. Only two cars finished the Pabst race, these being Robert's Mason and Hastings' Falcar, the latter having averaged 52 miles an hour for the entire distance, while Roberts averaged 58.8 miles an hour.

Three Survive in Pabst

Although there were four prizes offered for the Pabst race, only three awards were made, the third place being given to Chandler, also driving a Falcar, after he had completed twenty-three of the twenty-eight laps. There was no other car running to which the fourth award could have been accorded. It was nearly dusk when Hastings crossed the tape for the twenty-eighth time, and it would have been impossible for Chandler, still 56 miles behind, to have driven the remaining 5 laps, owing to the growing darkness. Consequently, Starter Wagner gave him the checkered flag at about the same time that he signaled the other Falcar on its final lap.

The Wisconsin race had five entries, but at the appointed time, only the three Mason cars lined up for the twenty-two-lap run. Two of them finished the race, Endicott's No. 5, which came in first in the time of 186 minutes, 44.79 seconds, and Mason's No. 3, which required 222 minutes, 40.35 seconds to cover the distance of nearly 174 miles. After going for three laps, Snyder's Mason developed clutch trouble, which put it out of the race. In this race, too, an award went begging. The start of these races was delayed 1 hour 30 minutes by rain, but the mud rapidly disappeared. After three or four laps the cars were kicking up dust.

PABST CUP WON BY DRIVER OF MASON

Eight cars lined up for the start of the Pabst event, which was run simul-

ROBERTS IN PABST CUP-WINNING MASON SWINGING INTO BACKSTRETCH AT CITY LIMITS TURN

Endicott Lands the Wisconsin Trophy

Masons Run First and Second in 161-230 Class Event at Milwaukee

WISCONSIN TROPHY WON BY MASON CAR

taneously with the Wisconsin race. Nikrent, driving a Case was the first to be sent off; following him, Rooney in a Bergdoll shot into motion. Then came Spencer Wishart, driving the first of the three Mercers entered in the event. After him Hastings in a Falcar was sent off, while Roberts, in Mason No. 16, was the fifth to feel Starter Wagner's pat on the shoulder, which was the signal to start. Pullen, piloting the second Mercer was next away, then Chandler in Falcar No. 18 got the word. Chandler, it will be remembered, was mechanician for Mulford at the Elgin races this year, driving the last lap of the free-for-all race for the noted pilot after Mulford had been overcome by the intense heat and carried from his car. It was Chandler's first race as a driver, and while he had considerable hard luck with his car, nevertheless, he drove a good race. Hughie Hughes, veteran of several races, and winner of the Aurora trophy race at Elgin this year, was the last to get away in the third Mercer, and the crowd was with him.

Hughes drove the same car which he used on Wednesday in the Vanderbilt but in order to do this, he was obliged to change motors. The Vanderbilt cup race is limited to cars having piston displacements between 301 and 600 cubic inches, while the Pabst trophy race required that the piston displacements should not be over 300 cubic inches. The motor which a bore .017 inch greater than that of the engine used for the Pabst race. The former has a displacement which is just within the limits for the Vanderbilt, while the latter is slightly below 300 cubic inches.

Running of Pabst Race

On the first lap, Roberts took the lead, making the distance of nearly 8 miles in 7 minutes and 35 seconds. Hughes negotiated the premier lap just 10 seconds behind Roberts, while Pullen was third in 7 minutes and 59 seconds. Nikrent in the Case was next, while Rooney, Chandler, Hastings and Wishart brought up the rear in the order named.

In the following circuit of the course, the leaders retained their same positions, and the only change in the eight cars' places was Wishart's nosing of Hastings out of the seventh position. This second lap was Rooney's fastest, he making the distance in 8 minutes and 1 second.

HARRY ENDICOTT, WINNER OF WISCONSIN TROPHY

HARRY ENDICOTT IN MASON, FINISHING IN WISCONSIN TROPHY RACE

CARS LINED UP FOR START OF SMALL-CAR RACES AT MILWAUKEE THURSDAY

Roberts made this lap in 7 minutes and 14 seconds, 9 seconds faster than did Hughes who was in second place. The third lap, which proved to be Nikrent's fastest, saw no change in the relative positions of the speeding cars. Nikrent made the lap in 7:26, which was 8 seconds better than his first circuit.

In the fourth lap, Hughes slipped from second place to fourth, owing to his being forced to stop at the pit for water. One of the water connections of his Mercer had been jarred loose, letting all the cooling water run out, and heating up his motor. Pullen who had made the lap in 7:32, now assumed second place, while Nikrent was a close third, being only 19 seconds behind. Wishart in this lap nosed Chandler out of sixth position, while Hastings was bringing up the rear.

Two Cars Out

Hughes was off again at a lively clip, cutting down his rivals' lead at every turn. In the fifth lap he snatched the third place from Nikrent, who was having trouble, while Chandler came into fourth place. The fifth lap was the undoing of

TIMES OF ALL CONTESTANTS IN THE PABST BLUE RIBBON

No.	Car	Driver		1 7 miles 1658 feet	2 15 miles 4036 feet	3 23 miles 3414 feet	4 31 miles 2792 feet	5 39 miles 2170 feet	6 47 miles 1548 feet	7 55 miles 926 feet	8 63 miles 304 feet	9 70 miles 4962 feet	10 78 miles 1340 feet	11 [illegible]
16	Mason—Special	Roberts	Elapsed time	7:35	14:49	22:12	29:28	36:48	44:05	51:21	58:34	65:43	72:49	[illegible]
			Lap time	7:35	7:14	7:23	7:16	7:20	7:17	7:16	7:13	7:09	7:06	[illegible]
15	F. A. L.—Special	Hastings	Elapsed time	10:06	19:49	32:45	42:26	51:29	60:16	69:12	77:50	86:34	95:46	[illegible]
			Lap time	10:06	9:43	12:56	9:41	9:03	8:47	8:56	8:38	8:44	9:12	[illegible]
18	F. A. L.—Special	Chandler	Elapsed time	9:32	18:25	27:13	35:58	44:16	53:32	62:20	71:07	79:52	88:31	[illegible]
			Lap time	9:32	8:53	8:48	8:45	8:18	9:16	8:48	8:47	8:45	8:39	[illegible]
17	Mercer	Pullen	Elapsed time	7:59	15:32	23:02	30:34	38:06	45:29	52:58	60:21	67:55	75:53	[illegible]
			Lap time	7:59	7:33	7:30	7:32	7:32	7:23	7:29	7:23	7:34	7:58	[illegible]
19	Mercer	Hughes	Elapsed time	7:45	15:08	22:29	33:03	40:37	47:50	54:59	62:09	69:11	76:15	[illegible]
			Lap time	7:45	7:23	7:21	10:34	7:34	7:13	7:09	7:10	7:02	7:04	[illegible]
14	Mercer	Wishart	Elapsed time	11:50	19:47	27:39	35:24	43:07	50:45	58:22	66:00	73:41	81:30	[illegible]
			Lap time	11:50	7:57	7:52	7:45	7:43	7:38	7:37	7:38	7:41	7:49	
11	Case	Nikrent	Elapsed time	8:09	15:43	23:09	30:53	44:43	Out with broken crankcase					
			Lap time	8:09	7:34	7:26	7:44	13:50						
12	Bergdoll	Rooney	Elapsed time	8:16	16:17	25:26	34:57	43:06	Out with broken connecting rod					
			Lap time	8:16	8:01	9:09	9:31	8:09						

RESULTS OF THE WISCONSIN MOTOR TROPHY RACE

No.	Car	Driver		1 7 miles 1658 feet	2 15 miles 4036 feet	3 23 miles 3414 feet	4 31 miles 2792 feet	5 39 miles 2170 feet	6 47 miles 1548 feet	7 55 miles 926 feet	8 [illegible]
5	Mason—Special	Endicott	Elapsed time	12:15	20:11	27:59	35:38	43:07	50:51	59:04	[illegible]
			Lap time	12:15	7:56	7:48	7:38	7:29	7:44	8:13	[illegible]
3	Mason—Special	Mason	Elapsed time	13:04	26:35	36:11	46:17	55:18	65:13	74:32	[illegible]
			Lap time	13:04	13:31	9:36	10:06	9:31	9:25	9:19	[illegible]
2	Mason—Special	Snyder	Elapsed time	10:57	21:10	29:11	Out with clutch trouble				
			Lap time	10:57	10:13	8:01					

both Nikrent and Rooney, both of whom were forced to give up the struggle after completing about 40 miles. Nikrent's car was disabled by a cracked crankcase, while Rooney's Bergdoll snapped a connecting rod.

By this change of fortune, Wishart came into fourth standing, while Hastings became sixth, Chandler fifth, Hughes remained third, Pullen stayed second and Roberts was still first.

Pabst Cars in Trouble

For the sixth, seventh, eighth and ninth laps there was no change in the places of the contestants. Roberts was still leading. Hughes made the ninth in 7:02, which helped to put him in second place when Roberts was forced to stop on the back stretch to repair a break in the gasoline supply pipe of his Mason. He fixed it temporarily on the back stretch and ran in to the pit slowly, losing about 5 minutes, and thereby losing first place, which he had held from the start. Pullen succeeded to the premier position. For the next ten laps the race was a duel between Hughes and Pullen, both driving Mercers.

Forgets to Turn on Gasoline

Roberts got away, but just below the grandstand he stopped again. He had forgotten to turn on his gasoline, having shut it off when making the repair to the pipe at the pit. This was his last stop, except for a few seconds in the thirteenth lap on the back stretch.

Meanwhile, Hughes and Pullen were fighting it out to a finish, although the former was gaining rapidly on his teammates, and on the twelfth circuit he had passed his rival and was 4 seconds ahead. Hughes' average speed for eleven laps, or nearly 87 miles, was 62.12 miles an hour, while Pullen covered the same distance slightly faster—62.6 miles an hour.

It was in the fifteenth lap that Wishart's Mercer gave out. From the eleventh lap up through the fourteenth he had been in third place about 6 minutes behind Pullen and Hughes and was making these rounds in good time, well over a mile a minute. But on the fifteenth round he was obliged to give up the struggle, for the crankshaft of his motor broke.

Wishart Out of the Race

At the end of the fifteenth lap the order was Hughes, Pullen, Roberts, Chandler and Hastings. The leader was tearing off a few seconds at each round, making the fifteenth the fastest he had done so far in the race. His time for this lap was 6 minutes 58 seconds, or at an average speed of 67.9 miles an hour. The sixteenth lap Hughes negotiated in 6:53, which was the record for the day, at the rate of 68.7 miles an hour.

At the end of the sixteenth Pullen was less than a minute behind Hughes and was pushing the leader to the limit. But in the next round Hughes blew a tire, which put Pullen in the lead again by 15 seconds. Hughie did not stop to replace


NIKRENT IN CASE GETS THE WORD FROM STARTER WAGNER

TROPHY RACE FOR EACH LAP OF THE WAUWATOSA COURSE

12 94 miles 3096 feet	13 102 miles 2474 feet	14 110 miles 1852 feet	15 118 miles 1230 feet	16 126 miles 608 feet	17 133 miles 5266 feet	18 141 miles 4644 feet	19 149 miles 4022 feet	20 157 miles 3400 feet	21 165 miles 2778 feet	22 173 miles 2156 feet	23 181 miles 1534 feet	24 189 miles 912 feet	25 197 miles 290 feet	26 204 miles 4948 feet	27 212 miles 4326 feet	28 220 miles 3704 feet	Position at finish	Miles per hour
00:20	110:16	117:27	124:34	131:44	138:50	145:58	153:05	160:10	167:10	174:18	181:29	189:08	197:38	207:08	216:32	225:08.71	1	58.8
7:15	9:56	7:11	7:07	7:10	7:06	7:08	7:07	7:05	7:00	7:18	7:11	7:39	8:30	9:30	9:24	8:36.71		
12:13	120:36	128:59	137:25	145:44	154:10	162:29	170:48	179:09	127:23	195:47	204:16	212:57	222:27	233:25	245:07	255:05	2	52.0
8:34	8:23	8:23	8:26	8:19	8:26	8:19	8:19	8:21	8:16	8:24	8:19	8:41	10:30	9:58	11:42	9:58.1		
05:49	114:26	123:11	131:54	140:42	150:27	173:45	199:10	211:41	223:12	235:25	248:08	Stopped and given third place owing to darkness						
8:38	8:37	8:45	8:43	8:48	9:45	23:18	25:25	12:31	11:31	12:13	12:43							
90:22	97:53	106:18	112:42	120:08	127:53	135:31	144:07	151:43	159:09	166:42	Out with broken gearset							
7:30	7:31	7:25	7:24	7:26	7:45	7:38	8:36	7:36	7:26	7:33								
90:18	98:27	105:38	112:36	119:29	128:08	135:05	142:00	149:02	156:24	Out with broken universal joint								
7:02	8:09	7:11	6:58	6:53	8:39	6:57	6:55	7:02	7:22									
96:57	104:43	112:32	Out with broken crankshaft															
7:42	7:46	7:49																

AT MILWAUKEE, WIS., WON BY ENDICOTT IN A MASON

70 miles 4962 feet	10 78 miles 4340 feet	11 86 miles 3718 feet	12 94 miles 3096 feet	13 102 miles 2474 feet	14 110 miles 1852 feet	15 118 miles 1230 feet	16 126 miles 608 feet	17 133 miles 5266 feet	18 141 miles 4644 feet	19 149 miles 4022 feet	20 157 miles 3400 feet	21 165 miles 2778 feet	22 173 miles 2156 feet	Position at finish	Miles per hour
01	85:17	93:30	101:58	110:12	118:38	127:03	135:30	145:06	154:21	162:29	170:39	178:52	186:44.79	1	55.6
21	8:16	8:13	8:28	8:14	8:26	8:25	8:27	9:36	9:15	8:08	8:10	8:13	7:52.79		
29	102:35	112:18	121:38	133:35	142:48	152:19	162:29	172:16	181:54	193:03	202:28	213:11	222:40.35	2	46.7
24	9:26	9:23	9:20	11:57	9:13	9:31	10:10	9:47	9:38	11:09	9:25	10:43	9:29.35		

the damaged tire on the back stretch but drove on the rim to the pit. But Hughes was quickly up to speed again, making the eighteenth lap in 6:57. This put him again in the lead, Pullen's holding of the premier position being momentary only. Hughes was now 26 seconds ahead.

Hughie Hughes Goes Out

The Englishman lasted for three more laps, which he made in fast time. The nineteenth was made in 6:55, and it put Hughes a little over 2 minutes ahead of Pullen. Barring accident, it looked as if Hughes would repeat his Elgin victory. But in the twenty-second lap, he had to give way to the other Mercer driver, as his No. 19 Mercer had broken a universal joint, a damage which presaged immediate repair. With only seven laps to go and with a widening breach between himself and his nearest competitor, Pullen, Hughie was obliged to become a spectator.

But Pullen, who was now an easy leader, being 8 minutes ahead of Roberts, who was second, did not fare much better than did Hughes, for after going only one more lap, something went wrong with his transmission, and the trouble was of large enough proportions to prevent his finishing.

Mortimer Roberts, who had previously been running third, came into the limelight. When Pullen went out of the struggle Roberts was nearly 8 minutes behind, but nevertheless, he was so far ahead of the two Fals, which were the only other contenders, that there was never any doubt of the winner from the twenty-third lap on.

Chandler Returns to Race

In the twenty-third lap, the three cars running were the two Fals and the Mason, Hastings' Fal running a poor second to Roberts. Chandler was far in the rear. In the eighteenth lap, he had limped to his pit from somewhere on the backstretch where a torsion rod had snapped. After standing at the pit for about 26 minutes while the break was repaired, and after giving up all thought of reentering the struggle, Starter Wagner sent Chandler off again, for he was sure of third money if he kept going. So he jogged along at his own pace.

Roberts finished the race in 225 minutes, 8.71 seconds, averaging 58.8 miles an hour for the 220 miles, while Hastings finished in 255 minutes, 5.1 seconds, averaging 52 miles an hour. When Hastings finished, it was getting dark, and the judges decided to flag Chandler and to give him third place without waiting for him to finish.

Much credit is due the little Mason car of Roberts' for its consistent going, and the Fals, though not exceedingly fast, should also be given credit for holding out. It seemed to be a day of breakdowns, and was a record which may perhaps never be equaled—out of eight entries only two finishing. The other cars should not be judged by their performance Thursday. All of them have brilliant records, and it merely was coincidence which caused them to all lay down as they did. There is no car which will last forever, or which will not have breaks, but it was too bad that these numerous misfortunes should all come at the same time.

Little interest centered in the Wisconsin trophy race, which was all Harry Endicott. At the same time, he drove a heady race, and made good time with his little Mason. Mason, also driving a Mason car, was the only other car to finish the race, coming in far behind Endicott. Although there were five entries for the event, Kulick who was to have driven a Ford Special withdrew as did Heber whose entry was an E-M-F.

At the start, only the three Mason Specials were in evidence, Snyder in Mason No. 2 being the first to be sent off. Then Mason was started, while Endicott, in No. 5 was off last. Snyder's running was better than that of his two teammates for the first lap, but Endicott did not take long to head him off, and at the end of the second lap, he was way ahead of the other two. Mason was third, and the second place would undoubtedly have gone to Snyder, whose car is much faster than Mason's which is a remodelled touring car, had the former not developed clutch trouble in the fourth lap, which trouble proved to be so serious that Snyder had to withdraw in favor of the other two Masons.

Fast Time by Endicott

Endicott's fastest lap was his fifth, which was run in 7:29, and which is good going for a small machine. He made only two stops during the entire run of 173 miles, the first being on his first lap, when a spark plug was replaced. The other stop did not take place until the seventeenth round, when gasoline was taken on. No tire trouble developed for Endicott during the entire run.

Mason No. 3 stopped at the pit on its third lap for a tire change, losing time by skidding by the pit and having to back up. More tire trouble developed in Mason's fourth lap, but he was not obliged to slow down again at the pit until the thirteenth lap, when water, oil and fuel were taken on.

On his nineteenth lap, Mason again stopped for water, and at the same time oil was put into the crankcase. This car, which is cooled by the thermo-syphon system, proved that such a system is not adequate for racing conditions. The other Masons were provided with positive pump circulation and they were not troubled by excessive heating.

More oil and water were taken on by Mason in the twentieth lap, the radiator cap having been lost in this round, allowing much of the water to spill out. But Mason completed the last two laps without stop. Endicott's time for the run was 186 minutes 44.79 seconds, which was an average speed of 55.6 miles.

EACH DRIVER'S FASTEST LAP

No.	Car	Driver	Lap Time	Lap No.	Speed In M. P. H.
		Wisconsin Motor Challenge Trophy			
5	Mason	Endicott	7:29	5	63.2
3	Mason	Mason	9:13	14	51.3
2	Mason	Snyder	8:01	3	59.0
		Pabst Trophy			
16	Mason	Roberts	7:00	21	57.6
15	F. A. L.	Hastings	8:16	21	57.3
18	F. A. L.	Chandler	8:18	5	57.0
17	Mercer	Pullen	7:23	5-6	60.0
19	Mercer	Hughes	6:53	16	63.7
14	Mercer	Wishart	7:37	7	62.1
11	Case	Nikrent	7:26	3	63.7
12	Bergdoll	Rooney	8:01	2	59.0
		Vanderbilt Cup			
22	Mercedes	De Palma	6:31	17-25	72.6
23	Mercer	Hughes	6:33	5	72.3
26	Mercedes	Wishart	6:24	5	73.9
27	Stutz	Anderson	6:27	16	71.5
28	Mercedes	Clark	6:34	21	72.0
25	Lozier	Nelson	6:17	15	75.4
29	Fiat	Tetzlaff	6:15	2-4	75.7
24	Knox	Mulford	6:31	1	72.5
		Grand Prix			
41	Fiat	Bragg	6:10	4-25	76.7
40	Benz	Bergdoll	6:20	4	74.8
43	Stutz	Anderson	6:10	19	76.7
44	Fiat	Oldfield	6:18	14	75.1
39	Mercedes	Clark	7:05	3	66.8
42	Benz	Horan	6:33	13	72.2
35	Mercedes	De Palma	6:25	34	73.8
33	Fiat	Tetzlaff	6:27	14	77.3
32	Lozier	Fountain	6:48	18	69.6
34	Mercer	Hughes	6:38	11	71.5
36	Mercedes	Wishart	6:20	2	74.8
31	Benz	Burman	6:42	2	70.6

Show Row Threatens in East

Electric Display to be Held in Grand Central Palace, New York, Likely to Bring About Clash with Automobile Board of Trade Because of Apparent Conflict

NEW YORK, Oct. 7—The makings of a fine little row have developed over the forthcoming electric show which opens at Grand Central palace October 9. The title of the affair contains the words "automobile show" and it is the purpose of the exhibition company to display about forty types of commercial and pleasure cars using electricity as motive power.

This has proved interesting to the National Association of Automobile Manufacturers, which has the right to sanction or refuse sanction to national motor car shows. In case a manufacturer exhibits at an unsanctioned show he is automatically barred from participation in the regularly sanctioned affairs, under rules of the N. A. A. M.

According to announcement made on Friday, the N. A. A. M. has addressed notice to the management of the Grand Central palace, calling attention to the fact that the Automobile Board of Trade

New York Show Allotments

Automobile Board of Trade Announces There will be Eighty-Seven Different Makes of Pleasure Cars in Madison Square Garden and Grand Central Palace

holds a lease giving it the exclusive right to conduct motor car shows in the building during a term of years and notifying the management that the electric show comes within the scope of the lease.

The Electric Vehicle Association comes out flatly and announces that it does not care what action is taken with regard to sanction or otherwise on the part of the N. A. A. M. George F. Parker, manager of the show and vice-president of the association declares that it is a matter of small moment to the association or its members as they have always been dissatisfied with conditions at the national shows.

As far as pleasure cars are concerned the electric show will not be particularly affected by the ruling. Only two companies apparently are touched. These are the Buffalo electric and Hupp-Yeats. The former drew for space at the Automobile Board of Trade show and will also exhibit according to present plans, at the electrical show. The Hupp-Yeats is made by the manufacturers of the R. C. H., which will be displayed under the auspices of the A. B. of T. and while there is a question as to the possibility of getting cars to New York in time for the electrical affair, the intention of the company to display its models at the palace is enthusiastically admitted by the New York branch. The status of Studebaker also is attracting attention, as its gasoline lines certainly will be shown at the national shows and it is entered to participate in the electrical exposition.

But when it comes to the commercial vehicles, there is a different story to tell. The list of exhibitors at the Board of Trade show has not been announced and will not be formulated until next week. The Chicago show allotments have been made. In the list are Buffalo electric, Studebaker, Waverly, M and P. electric, General Vehicle and others. In the prospective list of exhibitors at the commercial show of the Board of Trade, most of the foregoing and a number of others are expected to take allotments.

Of course there will be some sort of a settlement reached, but in the meantime the situation is full of possibilities.

NEW MEMBERS OF N. A. A. M.

New York, Oct. 7—The following companies have been elected to membership in the National Association of Automobile Manufacturers: Borland & Grannis Co., Flanders Electric Co., Speedwell Motor Car Co., Michigan Buggy Co., McFarlan Carriage Co., Argo Mfg. Co., and the Broc Mfg. Co.

NEW YORK, Oct. 5—Allotments of space for the show which will be held at Madison Square garden and Grand Central palace under the auspices of the Automobile Board of Trade during the week commencing January 11 were made Thursday. The members of the Automobile Board of Trade will be housed at the garden and the other manufacturers will be represented at the palace. There will be eighty-seven different makes of pleasure cars shown, including forty-six at the garden and forty-one at the palace. Those who drew space at the garden for the coming show are as follows:

Olds, Lozier, Stoddard-Dayton, Oakland, Flanders, Franklin, Stearns, Pope, Stevens-Duryea, Peerless, Locomobile, Mitchell, Winton, Cadillac, Buick, Packard, Hudson, Maxwell, Overland, Pierce-Arrow, Chalmers, Reo, White, Cartercar, Warren, Marmon, Garford, Columbia, Moline, Thomas, Premier, Pullman, Alco, Jackson, Mercer, Auburn, Haynes, S. G. V., Cunningham, Knox, Moon, Matheson, Selden, National, Abbott-Detroit and Velie.

It will be noted in the list above that the Alco, Auburn and Abbott are listed as members of the Automobile Board of Trade as they were elected to membership recently and have qualified. A number of additional applications for membership have been made and acted upon, but no announcement has yet been made as to who are included in the new list. The companies that will show at the palace are as follows:

Imperial, Cole, Inter-State, Case, Herreshoff, Krit, Cutting, Kissel, Paige-Detroit, Speedwell, Pathfinder, Austin, Regal, Buffalo Electric, Flanders Electric, Columbus, Metz, Studebaker, Fiat, Hupmobile, Kline, Henderson, Michigan, Benz, R. C. H., Bergdol, Stutz, American, Rambler, Ohio, Crow, Edwards, Atlas, Lenox, Davis, Paterson, Marathon, Havers, Westcott, Only Car and Marion.

The show spaces at the garden will be of the same size as last year, and all are taken. The plan of allotment among the members of the Board of Trade is based upon the amount of product turned out in the previous season, the largest producer getting first choice of space in the garden.

Among the exhibitors at the palace, division into two classes was made, the members of the N. A. A. M. constituting one and all others being classed together in the other.

Chicago show allotments made by the N. A. A. M. last week forecast the largest show ever held in the Windy City. While the total number of companies supplied with space on first allotment was slightly less than the total exhibit of last year, the overcrowding in some parts of the show building will be corrected by enlarging the spaces, thus accounting for the difference. At that, there are a dozen applicants waiting for space. The number of pleasure vehicle companies is about equal to last year, the decrease so far being noted in the commercial vehicle section of the show. All the standard companies are represented, the absentees being mostly defunct.

ST. LOUIS SHOW OPENS

St. Louis, Mo., Oct. 8—The sixth annual St. Louis show opened last night. It is one of the largest shows ever held in this city, having eighty-three displays of pleasure and commercial cars and accessories. There are more than 350 1913 models on display, each exhibitor showing from one to eight cars. Over sixty-five different makes of cars are being shown. This includes all models of the gasoline and electric propelled vehicle. One of the local summer gardens is the scene of the show, and weather conditions which were ideal for the opening should attract one of the largest crowds that has ever before visited the shows which have been held here.

GROWTH OF THE S. A. E.

New York, Oct. 8—The fiscal year of the Society of Automobile Engineers ended October 1 and a preliminary statement of the membership growth of the organization shows that 505 members were added during the past season. On October 11, 1911, the S. A. E. had 900 members of all grades. On October 7, 1912, the roll had been increased to 1,405 and there is a list of applicants numbering fifty-five persons which will be acted upon at the forthcoming meeting of council.

MORGAN OUT OF INDUSTRY

New York, Oct. 7—Under the recent plan of reorganization adopted by the Morgan Motor Truck Co. of Worcester, Mass., Ralph L. Morgan, one of the pioneer engineers of the industry retires from the company. Mr. Morgan has issued no statement as to his future intentions and plans. The company will continue to make and market the commercial vehicle that has been its trade feature for a number of years.

WRIGHT QUITS KNOX COMPANY

Springfield, Mass., Oct. 5—W. E. Wright, vice-president and general manager of the Knox Automobile Co., has resigned as one of the results of the financial embarrassment of the company and the new management. Mr. Wright has been a prominent figure in the automobile world for a number of years. His plans for the future have not been announced.

STEARNS TO SELL KNIGHT MOTORS

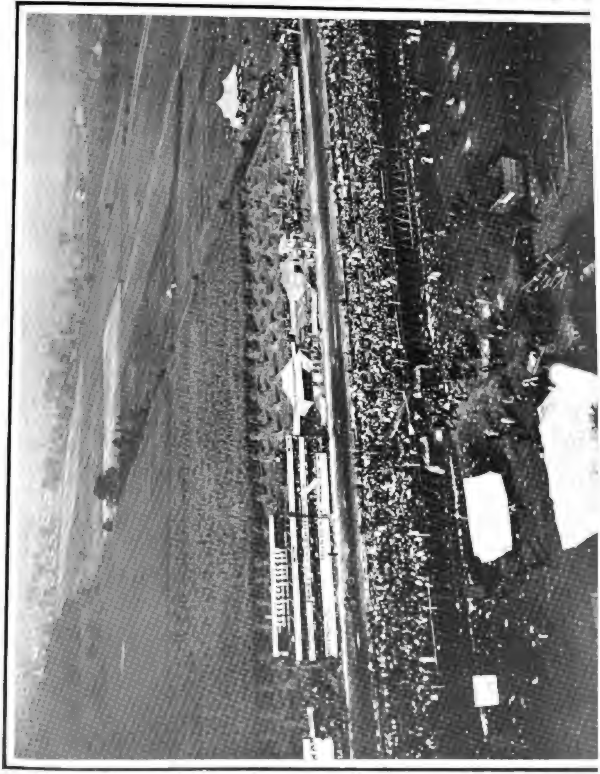
Cleveland, O., Oct. 8—Formal announcement was made today by the F. B. Stearns Co. that it is prepared to manufacture Silent Knight motors for the trade, which right is given it under the agreement with Knight & Kilbourne. The Stearns company has been making its plans to do this for the last 6 months by adding to the capacity of its plant. It is said negotiations with several concerns are now on.

Editorial

Spring Fever

Spring fever is a disease which has been known to attack students in all ages and in all parts of the world. It is a disease which has been known to cause students to neglect their studies, to neglect their duties, to neglect everything except the one thing which they have contracted the disease for

Road Race as Seen from an Aeropla



A most remarkable feature of the Milwaukee meet was that moving pictures of the grand prix were taken from an aeroplane handled by
num Fish. Fred Wagner, of Chicago, was the photographer, and one of his pictures is reproduced herewith, showing the stand and course,
first time, it is believed, a photograph of a road race ever has been taken from an aeroplane

Conflicting Stories About 1913 Races

MILWAUKEE, Wis., Oct. 8—The Vanderbilt cup, grand prix, Pabst and Wisconsin Challenge trophy races will be run on the Wauwatosa course in Milwaukee county next year, and the dates of the second running of the international road racing classics probably will be the last week of August or the first week of September. While the Milwaukee Automobile Dealers' Association, promoter of the 1912 classics, will be a principal in the management of Milwaukee's second speed carnival, the burden of responsibility probably will be borne by a stock corporation, composed of the principal commercial, business, civic and social organizations of Milwaukee.

This much is said to have been decided upon already. No definite announcement of the plans for the next year's races will be made until the M. A. D. A. has completed its work of closing up the business of the cup racing enterprise of October 2, 3 and 5—and that will take a couple of weeks at least.

Dealers Lose $25,000

An executive session of the M. A. D. A. was held at its offices in the Sentinel building last night, and it was announced that the international road races positively would be held in Milwaukee next year, despite the heavy deficit which the M. A. D. A. faces as the result of conducting the events last week. There are no figures available tonight which give any idea of the amount of the deficit, because not all bills have been scheduled, and checking of receipts from all sources has not been completed. However, it is believed that the dealers stand to lose not less than $25,000 on the venture. The $25,000 represents approximately the cost of the postponements made necessary, in the first instance, by the failure to complete the course on time, and in the second instance, by a spell of rainfall of 5 days' duration, which not only made racing impossible but ruined the course so it had to be almost entirely rebuilt.

The financial requisition for 1913 appears to consist principally of enough money to improve the course, guarantee a prize list which will outshine even the $20,500 handed out last week, and take care of the incidental expenses of management. It developed only during the coroner's inquest over Bruce-Brown's death that approximately $40,000 was expended in all in building the Wauwatosa course, which today is the equal of most road racing courses, but needs finishing touches that should not exceed $10,000 in cost. The recommendations of the coroner that the road be widened, the edges made correct, and the crown hard, smooth and even, seem to sum up any of the needs of the course at this time. It is safe to say that the promoter of the next road races in Milwaukee will be obliged to meet the coroner's requirement that the course be complete and ready for racing at least 6 months before races are actually held. It is ready for racing now, but if work is started at once and carried on through the winter, as weather permits, and the bulk done early in the spring, the Wauwatosa course will be the best in the world and the fastest.

There are many explanations extant as concerns the cause of the accident to Ralph de Palma on his final lap in the grand prix. Caleb Bragg, who is most directly concerned, claims that de Palma burst a tire, which caused his big Mercedes to swerve and get beyond his control. This explanation is generally accepted. Until the Italian driver is well enough to be consulted, his version will not be known. He is resting easily and while not out of danger, his physicians are confident of his recovery. De Palma's most serious injury is a puncture of the abdomen. It was at first believed that his hip was broken, but this developed into a cut about 10 inches long, down to the hip bone, probably resulting from being thrown against the wire fence with tremendous force. He sustained deep cuts in his chin and about the body. Tom Alley, his mechanician, left the hospital Sunday afternoon with his left arm in a sling. His shoulder was badly wrenched and his collarbone was fractured.

Bragg's Version of Accident

Bragg states that de Palma must have known that the No. 41 Fiat had a lead of better than 2½ minutes on him and that there was hardly a chance of winning. The Italian was driving as one possessed, and there is a possibility that he mistook his pit signals and gave the car all it could take to make sure of second place. However that may be, witnesses declare that de Palma rounded the hairpin turn at greater speed than was his custom, and shot down South Fond du Lac road at a rate that sliced off a few feet of Bragg's lead every second. Bragg took the knoll midway between hairpin and graveyard turns at his usual cautious speed, and as de Palma reached it a few seconds later, his car took a leap off the ground such as no car in the race had made. Three hundred feet beyond there is a culvert with a 3-foot iron railing, and at a point 60 feet behind this de Palma caught Bragg. There was a thud and the gray Mercedes slewed around, its long nose in the grassy bank, the body of the car athwart the road.

Bragg believes de Palma burst a tire when he landed on the ground after taking the knoll and lost control of the big car, which plunged down the road and hit the Fiat in the rear. De Palma's knowledge of the course, which at this point is rather narrow, leads Bragg to believe that he could not have intended to pass him there, with a culvert ahead.

Neither the officials nor the public lays a whit of the blame for the mishap to the grand prix winner.

Coroner Renders Verdict

That the American Automobile Association be compelled to formulate laws governing road construction for racing purposes; that such course must be at least 6 months old; that the edges of same shall be surveyed; that the physical composition of such course shall consist of the proper percentage of crushed stone, sand, cement and oil; that the crown be smooth and hard and even, and that the minimum width of such course at any given point shall be no less than 25 feet wide, which can be entirely used for driving purposes, and that curves shall be at a safe angle, are the recommendations of Coroner H. L. Nahin, of Milwaukee county, in his verdict on the death of David L. Bruce-Brown, of New York, racing driver, who died as the result of injuries sustained in an accident during practice on the Wauwatosa course on October 1.

Coroner Nahin lays no blame on anyone for the fatal accident, but states in his verdict that had the course been constructed on a more solid foundation, the crown smoother and harder, and the course wider and the edges more even, the catastrophe might have been avoided.

To carry out his recommendations that the governing body of motor racing formulate rules for construction of courses, the coroner suggests that a committee consisting of competent drivers and road constructors be appointed by the American Automobile Association to examine a given course, as well as the conditions of the racing machines before any racing is permitted on such course.

The coroner's verdict says that from the testimony adduced it appears that the course was newly built, that the foundation in some places was spongy, that the course was entirely too narrow for two machines to pass, and that the surface was rough and soft.

Milwaukee Expects to Repeat; Vanderbilt Says No Deal Has Been Made

VANDERBILT DENIES MILWAUKEE DEAL

New York, Oct. 9—Despite announcements made in the press that a contract has been made between the Milwaukee Automobile Dealers' Association and the Motor Cups Holding Co., which controls the Vanderbilt cup and the grand prize gold cup, providing for the holding of the classics at Milwaukee for a term of years, the report is flatly denied by William K. Vanderbilt, Jr., of the Holding company, donor of the Vanderbilt cup, and the American Automobile Association, under whose auspices the Vanderbilt cup races are run. He likewise denies any knowledge of the alleged contract.

Car Salesmen Listen to Sage Advice

A careful review of the testimony shows that it was the almost unanimous opinion of the drivers who were summoned as witnesses that the course was in good condition, and that the cause of the accident was a tire blowout.

The death on Tuesday of Antonio Scudalari, mechanician for Bruce-Brown, probably will require only a formal inquest, the verdict of which will be the same as that on the ill-fated driver. Scudalari was 27 years of age and had been Bruce-Brown's mechanician for 4 years, helping him win the grand prix races of 1910 and 1911.

WORKING ON INSURANCE PROBLEM

New York, Oct. 9—Special telegram—In an effort to bring order out of the present chaos pertaining to motor car insurance and to inject an element of competition that will work for more reasonable rates, the National Motor Indemnity Co. and the National Motor Insurance Co. have been chartered at Albany. The former concern will insure against motor car collisions, property damage and liability, and the latter will cover fire, explosion and marine hazards. The managements will be identical and the policies issued will be contained in one document if convenient and losses will be handled through one adjustment department. A number of prominent men in the industry are named among the incorporators of the companies, among whom are the following: William E. Metzger, A. G. Batchelder, Hugh Chalmers, Thomas Henderson, Albert C. Pope, Alfred Reeves, S. A. Miles, Winfred J. Foss, Edwin B. Jackson, A. F. Maltbie, George W. Hipple and Chester I. Campbell. William B. Joyce, president of the National Surety Co., will be chairman of the executive committee.

The companies will be affiliated with the Motor Union Insurance Co. of Great Britain, which has an intimate connection with the Motor Union, the big organization of car owners of Britain that corresponds with the American Automobile Association in the United States.

OWNERS IN RELIABILITY RUN

St. Louis, Mo., Oct. 5—Twenty-seven cars competed in the fifth annual owners' reliability tour conducted by the Automobile Club of St. Louis, today. All the cars but one finished the distance of 110.2 miles.

In class A, H. Ahrens, driving a Franklin touring car, finished with a score of 993, winning the Barnard trophy. S. S. Pingree was second with his Amplex, having a score of 991.

In class B, E. A. Limberg, driving a Locomobile, was first with a score of 998. James Hagerman, Jr., driving a Marmon, was second with a score of 993. Limberg won the Pingree trophy.

Convention at Indianapolis Attracts 400 Members of Motor Industry

INDIANAPOLIS, Ind., Oct. 8—Special telegram—Four hundred car dealers, members of the selling organizations of the motor car concerns of the country, and advertising agents, gathered in the auditorium of the Claypool hotel, this city, at the opening session this afternoon of the first general sales convention of motor car dealers, following a luncheon tendered to the visitors by the Mahin Advertising Co. of Chicago. Many prominent dealers, manufacturers and advertising men are here for the 2-day meeting.

Believing that the future of the motor car industry hinges upon the sales education of the dealer and thereby on the ability of both the selling organizations and advertising departments to intensify retail sales, men in this field of the industry responded eagerly to the suggestion of J. J. Cole, of the Cole Motor Car Co., that a convention of this nature be launched in Indianapolis, second only to Detroit in the motor field.

Everyone Enthusiastic

"Intensity" is the slogan of the gathering. Naturally, everything rests with the dealer, for if he fails, all fail; and so the main objects of the convention are to teach the dealer how best to increase his sales and to impress upon him the need for absolute co-operation with the factory whose car he sells. Almost all American cars of today are good ones and will stand rigid investigations, and it only remains to get them before the people in a business-like way. An enormous growth of the motor car industry should result from the present concerted movement for a combined effort to sell cars to the people.

W. D. Nesbit, of the Mahin company, presided at the session, during which six speeches were heard, the first of which was an address of welcome by J. J. Cole in behalf of the city of Indianapolis. The idea of helping the dealer in all his problems is worthy of all the efforts the car manufacturer can give, he said. H. O. Smith, president of the Premier Motor Car Mfg. Co., was the next to talk. The selling problem is the big one, not only with the motor car but with every branch of business, he said. A good dealer can hold up a poor car a good while, but a poor dealer cannot uphold a good car very long. Mr. Smith stated emphatically that there is nothing today which even promises to rival the motor car as a solver of the transportation problem. To increase sales, educate the salesmen, he said, it is most important of the dealer to select the best selling line for his particular territory. Further, he must have confidence in his line else he cannot hope to enthuse his prospects over what he has to sell.

C. F. Kettering, of Dayton, O., spoke on some of the human interest sides of salesmanship. Motor cars have become so common, he said, that we have slipped somewhat away from calling to the attention of those who do not know about such things what wonderful pieces of mechanism they are. Thousands still look upon them as experiments and to sell to such it is necessary to get them interested in the motor car's development. Relate in a human interest way the story of the manufacture of a tire, of a gear or of any other part of the car's makeup and you have the man interested. Do not say that he must lubricate a certain part, but show him the result of not doing so. Get the novice to understand the mechanical reasons for doing his or that and you not only have a satisfied customer but he will return to you when in the market again.

Leroy Pelletier, advertising director of the Flanders interests, gave a most entertaining talk on the co-ordination of advertising and sales. He is strongly in favor of conventions such as this, he stated, and said further that the main idea of the gathering is for every man to learn to boost for the product in the sales in which he is interested. The competitor who gives him the greatest run is the one he admires.

Mr. Pelletier believes that when we get a perfect co-ordination between the advertising and sales ends of a concern there is nothing which that concern cannot do. It is hard for the dealer to realize that the national advertising campaign is for his benefit, but this is the case, although it is a selfish interest which the car maker has in him, for dealers' sales mean factory sales. It is important for the dealer to know just what has been said in the advertising, otherwise he cannot talk intelligently to those who come in response to such advertising. There is not a large percentage of good salesmanship in the motor car business according to Pellitier. The adding machine and the cash register salesmen are much better at it, for the only reason which the factories recognize that not to secure an order from a prospective customer is death of the customer. The repair man should be a consummate salesman, and not a knocker, as it is too often the case.

Pelletier Makes a Prediction

Speaking further of the convention, he said that the ideal cannot fail because it is a good one. Next year the attendance will be much greater.

Charles A. Bookwalter, former mayor of the city was the next to speak. He traced the evolution of the motor car from the ancient means of transportation down to the present almost perfect car.

GREGOIRE CARAVAN AND HISPANO-SUIZA, WINNERS IN SAN SEBASTIAN RALLY

Gregoire Wins European Motor Rally

Unique Competition to San Sebastian Brings Out Many Starters

SAN SEBASTIAN, Sept. 27—Out of the 100 competitors, a Gregoire caravan won first place in the European rally ending at San Sebastian. The Gregoire people were wise enough to see that in order to win this competition they must carry the greatest possible number of passengers, travel the greatest distance and have the smallest possible motor. They therefore selected one of their semi-racing types of chassis, having a high-efficiency grand prix type motor and sent it to Posen, in Poland, to make a run of 1,470 miles, ending at the Spanish holiday resort.

The chassis was specially trussed with a view to carrying eleven persons, representing with their baggage, accessories, and bodywork, a load of about 3 tons. With a keen eye to business the Gregoire company equipped this chassis with a caravan body bought for a few dollars from a band of wandering gipsies. With all the accessories, such as chimney, flower pots, bird cage, sweeping brushes, bundles of rags, etc., the combination was so strange that the police were required to keep the spectators back in nearly every town passed through. The crew, consisting of Driver Porporato, the Gregoire agent in Berlin, his wife and relatives, entered into the spirit of the movement, transforming themselves into wandering gipsies, and on arrival at San Sebastian driving through the town with banjoists seated on the roof of their caravan.

The rally regulations provided that a start should be made from various European cities on given dates, the competitors uniting at Bordeaux, then proceeding in a group to San Sebastian. They had to maintain a commercial average of 19 miles an hour and about 240 miles a day. For every 100 kilometers they received 4 points; for every passenger, 5 points; for every 100 kilogrammes in weight, 1 point; for a closed body, 8 points; and for an open body, 3 points. To equalize chances, deductions were made as follows: For every liter cylinder area, 10 points; for every kilometer less than average imposed, 2 points.

To get advantage of the mileage points nearly all the competitors sought to start as far away from San Sebastian as possible. Results showed that the rules were such that the short-distance tourists had little chance of being well placed. The necessity of running out to a distant starting point necessarily increased the mileage, many of the cars covering 1,000 miles before officially beginning the run. There were exceptionally few failures to meet the minimum requirements, for over sixty cars made the trip from such points as St. Petersburg, Warsaw, Berlin, Amsterdam, Vienna, Milan, Brussels, etc., without a loss of points, and their final position could only be determined after careful weighing and calculation. The Gregoire, heading the list with 144.9 points, was followed by a Hispano-Suiza with 116.6 points, a Berliet with 108.7, a Laurent-Klement with 104.5, an Apollo with 101.1, and 60 others in decreasing value.

The feature of the tour was the small size of the motors in view of the big load carried and the long distance covered. Intended primarily as an advertising scheme for the town of San Sebastian, the rally had the valuable quality of showing up the regularity of cars under long-distance touring conditions and of revealing what can be dône with motors of really very small dimensions. The accompanying table, giving the particulars of the first ten cars only, shows the distance covered and the approximate load carried. The exact weights have not been published.

In addition to these, fifty-two others were classed, among them being a Ford car, the only American competitor in the rally. A few days before the start of the event some changes were made in the rules; as notification of these could not reach Russia before the departure of competitors from St. Petersburg, a separate list of awards was made for all those having started the run from Russian territory. Under this heading the winner was a Metallurgique car of 3.5 by 5.5 inches bore and stroke, covering a distance of 2,225 miles in its run from St. Petersburg, and securing 163 points, the highest number given to any competitor. The car had a torpedo touring body with five persons aboard. The second under the heading was a Russo-Baltique, of 4 by 5.1 inches bore and stroke, driven by M. Nagel, with six other persons aboard, also coming from St. Petersburg, and winning 152 points. The third was a similar car with only two passengers, also from St. Petersburg, and winning 96 points.

On the arrival at San Sebastian, an elegance competition was held, when the inside-steering Delage, having won eighth

ORDER OF AWARDS MADE IN SAN SEBASTIAN MOTOR RALLY

Car	Bore & Stroke	Starting Point	Miles	Body	Passengers	Points
Gregoire	3.1x5.9	Poland	1470	Caravan	11	144.9
Hispano	3.1x7	Warsaw	1640	Torpedo	4	116.6
Berliet	2.7x3.9	Berlin	1204	Berlin	4	108.7
Laurin	2.7x4.3	Vienna	1320	Torpedo	4	104.5
Apollo	3 x4.6	Koenigsberg	1660	Touring	6	101.1
Berliet	3.9x5.5	Vienna	1320	Limousine	4	98.1
Simplicia	2.7x3.9	Berlin	1304	Touring	4	97.1
Delage	2.9x4.7	Amsterdam	1052	Berlin	4	88.5
Sava	3.1x5.5	Brussels	907	Torpedo	6	77.58
Metallurgique	4 x5.9	Brussels	907	Coupé	5	77.55

place on the general list, was awarded the first prize for elegant appearance, being followed by the Metallurgique coupé hailing from Brussels, a similar car from Berlin, a Scap, a Gregoire inside-steering, and a Scar. In the open car section the first prize winner was M. Aschoff's Metallurgique torpedo.

A hill-climbing competition also was open to all the rally competitors, divided into three classes, two of them being for open cars, two for closed cars, and one for cars without any limitation. In the small section of the open cars the fastest was Porporato's Gregoire, which with its caravan body had carried eleven persons across Europe. It covered the 3 kilometers of winding gradient averaging 10 per cent, and having a number of difficult turns, in 4 minutes 31⅘ seconds.

In the big touring car class the first prize winner was a Rolls-Royce in 4:33⅘, second being a Delaunay-Belleville, followed by a Turcat Mercy, and a Scap.

BELGIUM HOLDS ROAD RACE

Spa, Belgium, Sept. 27—Speed, regularity, and endurance were the determining factors in the 269-mile race in the Belgian Ardennes. Unable to obtain the exclusive use of the set of roads, the route was divided into twelve sections, of which eight had to be covered on a regularity basis according to cylinder area, and four at speed; of these four there were three straight sections and a difficult climb.

Some very high speeds were maintained by the small racing and touring cars, and under the formula the small motors had an advantage over the big ones, for although these latter were the fastest they did not succeed in winning high places on the list of awards.

In the racing section highest points were won by Wery's Nagent, a four-cylinder of 2.7 by 4.8 inches bore and stroke, whose time for the four speed sections of respectively 7, 9, 4 and 8 mile stretches was 63.1, 64.1, 63.3 and 52.1 miles an hour. This last time represents the hill-climb. Second place went to a Mathis of 2.7 by 4.7 inches bore and stroke, third to an Alfa-Legia of 2.5 by 3.9, and fourth to Christiaens six-cylinder grand prix Excelsior. This car was the fastest in the meeting, its highest average being 93 miles an hour, but it was at a disadvantage on the regularity sections, where an unusually high average speed had to be maintained on roads open to all kinds of traffic.

In the touring classes Germany had all the glory, Joerns in an Opel winning first place, followed by Erle in a Benz, De Crawhez in a Mercedes, and Wilford in a Benz. Belgian cars, Sava, Fab, Hermes and Imperia made a good showing; French cars were not very well represented and two Flanders were classed respectively twenty-first and twenty-sixth.

In the hill-climb the awards were made on the total of three attempts, the distance of each climb being 3.1 miles and the average gradient 6 per cent. The fastest work was done by Christiaens in the six-cylinder Excelsior; total time, 9 minutes 4-15 seconds. The winners in the respective racing classes were Wery, Nagent, 13:07⅗, and Elskamp, Mercedes, 11:15⅘. Among the tourists Wilford in the Benz put up the finest performance, his totalized time being 11:34⅗, easily defeating Erle's Benz in this class. The other class winners were de Crawhez, Mercedes, 11:58⅗; Kryn, Sava, 17:00⅕; Joerns, Opel, 14:40⅕.

UNITED MOTORS' ANNOUNCEMENT

New York, Oct. 9—Special telegram—According to authoritative information, the plan of reorganization of the United States Motor Co. has been settled. The merchandise creditors, represented by an active committee, have labored steadily for weeks to reach an equitable basis that would prove acceptable to all classes of claim holders and under the plan formulated it is understood that the following main facts will be covered:

All the existing securities of the company, amounting to about $11,500,000 of preferred, $12,200,000 common and $6,000,000 debentures will be wiped out and new securities will be issued in their places; in addition $130,000 of the preferred stock of the Columbia Motor Car Co. and $118,000 of the common will be subjected to the same treatment. The basis of the new issue will be an assessment of $24 a share on the common and preferred stocks of the United States Motor Co. and the Columbia Co. as outlined.

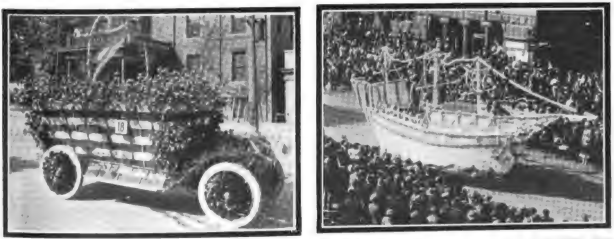
The total capitalization will be scaled down as follows: For and in consideration of the $24 a share the new company will issue in exchange for the preferred certificates 24 per cent of new first preferred 25 per cent of second preferred and 30 per cent of common. For the common certificates outstanding on payment of all assessment of $24 a share the new company will issue 24 per cent of first preferred, 17½ per cent of second preferred and 30 per cent of common. This assessment means that the new company will start out with a clear capital for working operations of about $2,000,000. It is proposed to raise by this method the sum of $5,720,000. The remainder will be used for funding the matured obligations. At this time there is still remaining in the treasury of the company the sum of $1,000,000. The disposition of this fund was one of the chief matters in contention in the long, painstaking deliberations of the merchandise creditors.

At first it was proposed that the creditors of the various companies that had supplied parts, materials, etc., should receive any cash allotment. Then the proportion offered was raised to 10 per cent. Neither of these early proposals was considered as equitable by the creditors and a counter demand was made for 30 per cent.

This was refused by the general creditors as including the banking claimholders, and a compromise was reached by which the merchandise creditors will receive 25 per cent of their claims in cash, 25 per cent in first preferred, 25 per cent in second preferred and 15 per cent in common, thus making a settlement of approximately 90 cents on the dollar. While the agreement will not be announced until next week as to the details, the main facts are assuredly contained as above.

OMAHA HOLDS BIG PARADE

Omaha, Neb., Oct. 5—There were forty pleasure cars and motor trucks entered in the floral parade, which was one feature of the Ak-Sar-Ben festivities in Omaha last week. In the class for most beautiful cars, that of Mrs. Emma B. Manchester, decorated with pink roses and maiden hair fern on a field of white, took first prize; second, Thomas McShane, car decorated with oak leaves, hollyhocks and asparagus fern; third, Omaha Taxi Co., built in shape of throne, with two little tots driving with crimson reins; fourth, M. C. Peters, a debutante's car, covered with white and decorated with apple blossoms



OMAHA PRIZE WINNERS—MRS. F. J. HARRINGTON'S CAR, DECLARED TO BE OF MOST UNIQUE DESIGN, AND COLUMBUS' SHIP THAT WON TRUCK HONORS

Erle Climbs Hill at 101.5 Miles Per Hour

Benz Breaks Record in Gaillon Contest in France by 1 Second

PARIS, Oct. 6—This year's Gaillon hill-climb,, which has just been run brought great satisfaction to the spectators, due to the splendid performance of the winning Benz, driven by Fritz Erle, who finished in 22 seconds, breaking his own record of 23 seconds, which has stood since 1910, when he broke the 1906 record of Leo Guinness, which had been 25 seconds.

Erle's performance, which means a speed of 101.5 miles an hour on a 9 per cent grade of 1 kilometer length, was far ahead of the time made by rivals. Chavez, who drove Wagner's grand prix Fiat, made second best time in 26.2 seconds. The other performers were:

Car	Driver	Time
	Crespelle	:36
Anasatti	Guyot	:37
Hispano-Suiza	Bara	:37.3
*Bedelia	Bonville	:39.3
Alcyon	Barriaux	:41
Bugatti	Pouget	:45.3
Bugatti		:53.2

Touring cars which climbed the hill and their drivers were:

Car	Driver	Time
Hispano-Suiza	Derny	:80
Benz	Erle	:43.3
Scap	Mollet	:47
Sunbeam	Rigal	:47.4
Scap	Charles	:48
Motobloc	Delpierre	:50.4
Barre	Ravaud	:52
Scap	Launais	:55.1
Bugatti	Tonello	:58
Panhard-Knight	Artault	:58

*Renault aviation motor

FIFTEEN IN CHICAGO RELIABILITY

Chicago, Oct. 8—Fifteen entries are already in for the Chicago Motor Club's sensational reliability run around Lake Michigan, which is scheduled to start October 21, and it is believed that at least half a dozen more will be rounded up. But even the fifteen make a larger field than any other reliability of the year has had outside of sociabilities or club events.

Already in are a Velie, two Stutzes, a Falcar, Detroiter, Case, Chalmers six, two Stavers, two Coey Flyers, two Bergdolls and two Molines, while there are excellent hopes of getting two R. C. H. cars, Marion, Cino, Ohio, Cutting, another Velie, Henderson, the two military Cadillacs, Mason Paige-Detroit and cars equipped with Rayfield and Stromberg carbureters.

PROGRESS OF WHITE PATHFINDER

Leadville, Colo., Oct. 8—Special telegram—The White six pathfinding car which is blazing a route from Denver to Salt Lake City left Denver at 9 o'clock yesterday morning with James A. Harris, of the White company; N. Lazarnick, a New York photographer; Walter Rheinick, the driver, and John P. Dods, of the Automobile Blue Book, who is logging the route. The party reached Jefferson, Colo., in the evening and found the roads remarkably good. The roads compare favorably with any of the mountain roads in the east, and the tourists found it the most wonderful they had ever seen. Most of the roads are fine dirt or gravel with very few rough spots. Some of the grades are as high as 18 per cent, but all the new work that is going in reduces the grades to not more than 5 per cent.

The magnificence of the scenery is beyond description. It begins at Morrison in the Red Rocks park and continues all the way up the rough Bear Creek canyon, with constant climbing a good deal of the way to Conifer, 8,150 feet above sea level, then down to Bailey's and up the South Platte canyon across Kenosha pass at an altitude of 9,980 feet. A good deal of snow was encountered in the road, but there was no trouble in coming down the pass into the wonderful South Park. This is a broad flat valley actually on top of the world and completely surrounded by snow-capped peaks. The night was spent at Jefferson. It was very cold there and everything was frozen in the morning, but it was bright and clear. The party was on the road early and found fine grade practically all the way into Leadville, the night stop. Even with the ground wet with the melting snow chains were not needed. The ride down South Park pass offered constantly changing views of the high snow peaks. Trout Creek pass at an altitude of 9,470 feet and 114 miles from Denver and from there to Buena Vista is almost all down grade through Trout Creek canyon past Castle rocks, with the first real views of the continental divide. The afternoon trip from Buena Vista up the Arkansas valley offered some thrills where the new road has been cut out along the hillside 600 feet above the river. There are miles of this with good surface but narrow road. At Granite the Twin Lakes road was followed. Twin lakes nestle right at the foot of the highest peaks, mount Elbert on the right, 14,421 feet high, and Twin peaks on the left, nearly as high—a remarkable setting for the beautiful lakes. A snowstorm on the peaks above was seen when the party was in sunshine.

The pathfinder arrived at Leadville, the highest city in North America, at 6 o'clock in the evening and expects to make Tennessee pass and Glenwood Springs without trouble tomorrow.

HILL-CLIMB AT ASHEVILLE

Asheville, N. C., Oct. 3—Under ideal weather conditions, the first sanctioned A. A. A. hill-climb ever held in Asheville was contested today. A crowd of about 4,000 people turned out to see the racers climb the steep French Broad avenue hill, which has a grade of 12 per cent for nearly ½ mile. In spite of the fact that the officials and drivers were to some extent handicapped by inexperience, the climb was a good one and some good time was made. Owing to withdrawal of entries, only five of the eight scheduled events were run. The climb today is only an experiment leading up to a great hill-climb which it is proposed to hold here next year. The winners in the various classes today were as follows:

Under 161 cubic inches piston displacement:

Car	Driver	Time
Flanders 20	Frank Mears	:55[illegible]
Flanders 20	Frank Mears	1:10[illegible]

161-230 cubic inches piston displacement:

Car	Driver	Time
Ford	W. R. Bolter	:52[illegible]
E. M. F. 30	Frank Mears	54[illegible]

301-450 cubic inches piston displacement:

Car	Driver	Time
Buick	Neil Plemmons	49[illegible]
Nyberg	A. G. Dale	56[illegible]

Free-for-all.

Car	Driver	Time
Nyberg	A. G. Dale	:53[illegible]
Ford	W. R. Bolter	54[illegible]

Cars $1,600 and under:

Car	Driver	Time
Flanders 20	Frank Mears	56[illegible]
Chalmers	G. E. Henderson	64[illegible]

ALCO TRANSCONTINENTAL TRUCK AND ESCORT ENTERING PETALUMA, CAL.

Knox Reports Outlook Encouraging

Enough Orders for Cars on Hand to Operate Factory 4 Months or More

SPRINGFIELD, Mass., Oct. 5—The outlook for the Knox Automobile Co., of this city, which made an assignment to Edward O. Sutton and Harry G. Fisk last week for the benefit of its creditors, looks much more hopeful now than it did a few days ago. Edward O. Sutton today made a emphatic denial of the rumor that 130 men had been discharged and that the payroll had been cut down one-half. He stated that the company had started along the lines of intrenchment, and so it had been necessary to lay off eighty-five employes.

According to Mr. Sutton, who is the superintendent and general manager, and therefore knows the real facts, the number laid off represented but 20 per cent of the force instead of 50 as alleged. He was not prepared to say what further reductions might be made, for it all depends upon business conditions.

Mr. Sutton stated that the prospects are more encouraging than could have been expected for the continuation of the business. He pointed out that at the time of the assignment there were orders on the books for seventy-one vehicles, and since that time eight more were received, two of which reached the company yesterday. To fill these orders it will be necessary to operate the factory for at least 4 months, and as the indications are that the business will be coming in as usual no necessity for a shutdown is expected.

Plans for the reorganization of the company have not been completed yet, but they are under way. It is the wish of the officials to continue operation until capital can be interested. The support of the board of trade will be solicited to aid in the reëstablishment of the company on a sound basis, and this will be of much help. Mr. Sutton stated that by figuring in the real estate owned by the company the assets would amount to more than the liabilities and that this would be of much value in bringing about a plan for continued operation. He added, however, that the officials would be willing to sell outright if a fair price could be secured.

SAN FRANCISCO POLICE ESCORT COAST TO COAST ALCO INTO CITY

POPE HAS GOOD YEAR

Hartford, Conn., Oct. 5—The annual report of the Pope Mfg. Co. for the year ending July 31 has been issued to the stockholders. It shows that the company has enjoyed net earnings during the past year amounting to $251,290 on a gross business of $3,734,112. According to President Pope's report the assets of the company consist of the following items:

Real estate, patents, good will, etc.	$5,781,293
Construction	36,276
Additions, adjustments and installation	243,681
Cash items prepaid	534,177
Inventories	1,477,312
Good accounts	396,608
Cash and cash items	253,829
Total	$8,723,176
Less deductions for reserves, replacements, etc.	440,998
	$8,282,178

The liabilities are as follows:

Capital stock issued	$5,980,000
Two-year 6 per cent gold bonds	1,000,000
Accounts payable, payrolls, deposits, etc.	260,098
Contingent liability	20,159
Surplus, 1911	936,430
Net earnings, 1912	251,293
Total	$8,457,070
Less dividends	174,892
	$8,282,178

The surplus of the company stands over $1,000,000 after writing off $440,000 for reserves and for future replacements, scrapping of machinery and deterioration. No doubtful accounts are included in the statement. The company paid 6 per cent on its preferred stock and made one payment of 1 per cent on the common.

President Pope says that the plants have been kept in the most efficient condition and the cost of up-keep charged to operations. The inventory was made at actual cost and the item of accounts payable covers invoices that had not matured on July 31. All bills have been discounted.

Speaking of the new medium-priced model he says that the augmentation of the line of product has made additional factory space necessary. The new building, which will have 70,000 square feet of floor space, was nearing completion at Hartford at the time of the report. The truck has met with success, according to the report, and a 5-ton model will be added to the present output of 3-ton wagons. The motor cycle business has been good.

When the report was mailed October 1 the company reported all the orders for pleasure cars that can be manufactured during the coming year and substantial orders for trucks.

ALCO CREW GIVEN BANQUET

New York, Oct. 8—Members of the crew which piloted the transcontinental Alco truck from Philadelphia to Petaluma, Cal., were honored at a dinner given last night by the American Locomotive Co. After a speech of welcome by Harry S. Houpt, general sales manager, and a brief address by Charles W. Young, head of the concern that owns the truck, there were talks by E. L. Ferguson, the veteran pilot, who was captain of the expedition, Frank Morin and Walter Dick, drivers, and John Cambon, assistant.

Predictions were made that interurban motor truck deliveries will be more common than ever before, and that the trip of the truck over bad roads and weak bridges will have the effect of stirring associations toward making improvements in all sections of the country. It was announced that the truck made its 4,145-mile journey in 409 hours of actual running time, which, reduced to operation without stops, amounts to 34 days of 12 hours each.

ANOTHER ATLAS ATTACHMENT

Springfield, Mass., Oct. 5—The Atlas Motor Car Co., of Springfield, Mass., which was forced to suspend operations some weeks ago because of the failure of the Atlas Motor Car Co. in the west, preventing the former company from securing motors, has been attached again. Three suits were filed against the company during the week. The Hampden Brass Co., of Springfield, Mass., filed an action for $1,500; the R. E. Dietz Co., of New York, one for $200, and the Firestone Tire and Rubber Co., Akron, O., one for $200 also.

Uncle Sam's Grip on Europe

By W. F. Bradley

PARIS, Oct. 1—Paris may be considered both the headquarters and the stronghold of continental Europe's motor industry. It is the birthplace of the motor car; the greatest manufacturing center in the old world; it has the protection of national pride and of customs duties. With such a combination of factors in its favor, it is hardly to be expected that the American car will figure prominently in the French capital. As a general rule French manufacturers are only beginning to realize that the American product is a vital factor by the reports and complaints coming to them from the British representatives. At home they are not alarmed at, or seriously interested in, an American invasion.

Early Cars Ridiculed

Yet, with their natural tenacity, American manufacturers have been endeavoring to secure a footing on the French market for the last 7 or 8 years. With rare exceptions they were laughed out of the field; among those exceptions was the little Oldsmobile, which had a brief period of success and still has a few of its tiller-steering models doing service in districts where fashion does not hold sway. In addition to a natural prejudice against any foreign-built car, the American machine had to suffer for the sins of the American bicycle and had to bear down a lot of criticism against its high-clearance and ungainly lines. They are what is known as the stock objections, and the very mention of an American car will even now bring them forth, before the car is introduced. They are high clearance, unsuitable lines, ungraceful bodies, poor workmanship, and lack of finish. Although American methods have altered considerably during the last half dozen years, the objections remain and with them the bad impression of the methods of some of the earlier dumpers.

America's Hold on Market

But America has now got a hold on the French market and has its recognized place in Paris motor row. In the car section of the business Ford has secured the premier position, and indeed to the average Frenchman Ford personifies the American industry. Ford made his first serious attempt to secure a position on the European market in 1908, the cars being shown at the Paris salon of that year and an energetic business campaign opened. The cars had been sold on the European market, however, before that date. Ford had to take the full brunt of the stock objections, rendered the more serious because those on appearance and clearance were unanswerable.

Ford's European Business

The reply to them was effective, if not direct—low price; and when, after demonstration on demonstration, it was proved that the low price included reasonably good wearing qualities, the car made headway. As an indication of the important position secured by Ford on the European market, the following list is of interest. The figures show the number of cars sold in the various European countries for the 12 months ending September 30, 1912. England, although the best customer, is not included, the conditions there being entirely different from those on the continent. Although given out by the Ford company, the figures appear to be accurate; indeed, those for France, which the

PARIS BRANCHES OF FORD, PACKARD AND PIERCE-ARROW

American Cars Growing in Popularity

writer has had opportunities of verifying, may be taken as entirely correct.

France	462	Holland	28
Russia	294	Switzerland	27
Germany	207	Denmark	22
Spain	126	Norway	16
Belgium	79	Turkey	15
Italy	69	Portugal	9
Austria-Hungary	54	Egypt	5
Sweden	66	Servia	4
Bulgaria	41		
Roumania	42	Total	1,566

Up to the present the Ford business has been conducted through a general selling agent for the whole of France and a central office in Paris for the control and development of the business in the various European countries. England has always had its own organization. At an early date, however, the European business will be a branch of the American concern, the general selling agent being abolished. Whether an agency is established or a European branch formed, it has been amply proved that anything approaching dumping is doomed to failure in Europe.

Service a Necessity

French motorists practically live at the doors of the home factory and have acquired the habit of letting the factory know at once if the car is not giving good service or they are not being satisfactorily treated. Americans must at least equal the home firms in this respect, maintaining a necessary stock of spares ready for shipment at any moment and expert mechanics capable of removing the real or imaginary defects in the running of the cars.

To place any American car on the French market the selling price necessarily must be increased 22 to 25 per cent. This represents freight charges and duty at the rate of $22.50 per 100 kilos. But in order to induce agents to handle an unknown foreign car it often is necessary to offer much higher commissions than for any European car, with the result that some American cars are offered for sale in Paris at an increase of more than 50 per cent over the retail New York or factory price.

One American car sold in New York at $725 is listed in Paris at $1,100; another listed at home at $950 is sold here at $1,500; a third costs $1,150 in America and $1,850 in France; a fourth $1,750 at home and $2,400 abroad. Naturally the percentage of increase may vary considerably, for the manufacturer may make sacrifices to meet the foreign market; but the freight charges and customs charges are invariable and must of necessity add to the cost from 22 to 25 per cent.

After Ford, Mitchell undoubtedly is the oldest established of the American firms in Paris. The firm is the European branch of the Mitchell-Lewis Motor company, and not merely an agency. In this case a direct bid is made for the medium class of trade, the class which is most highly developed by the European factories, and in which competition is naturally keenest. Even in this class the American car has a slight advantage in the matter of price, obtained very largely by the economics made in body building and general equipment.

One American Advantaga

The difference in price between the American chassis and the completely equipped American car is so slight that no European body maker could produce a body at the figure. It is in this particular feature that the American has one of his most important advantages over the European. Car makers have devoted themselves to chassis production so exclusively that, to take but one example, the

PARIS BRANCHES OF STUDEBAKER, REO AND MITCHELL.

REPRESENTATIVE MOTOR CAR SALESROOMS IN LONDON

Renault works, the largest in Europe, does not produce a score of completely equipped cars a year. Individual owners have asked for their own peculiarities to be worked into the body, and manufacturers have given way to them to the detriment of standardization. During the past year several of the American manufacturers of medium-priced cars have come on the French market. These are Reo, Buick, Hupmobile, Studebaker and Overland. In all cases the business is managed by agents who have not been established a sufficient length of time to allow an estimate to be formed on their ultimate degree of success.

Packard Touring Bureau

American high-grade cars are represented in Paris in quite a different manner. Nearly half a dozen years ago the Packard Motor Car Co. opened a touring depot in Paris for the convenience of its clients touring Europe. The object was to supply spares and give all possible touring information and assistance to Packard owners. The office, which is now in charge of R. N. Goode, has grown enormously in importance. It is declared that 400 Packard owners have personally reported to the Paris office, or have been reported by the home dealers, during the past 12 months.

Despite every endeavor to keep in touch with all Packard tourists in Europe, a certain number must come in and return home without either the Paris office or the home agent being aware of their visit to the old world; thus the record on the company's books is necessarily slightly below the total number of cars having entered Europe. The Packard depot comprises a touring bureau, supplying free all information on routes, customs, etc.; a spare parts department with such an assortment that any required part can be shipped within an hour of the receipt of a telegram; and a well-equipped repair shop.

During the present year the scope of the depot has been extended by the opening of a rental department. This undoubtedly has been a very wise move on the part of the company. Not only are the cars kept in constant service—for the touring season is no longer confined to the months of July, August and September—making the venture a financial success, but their presence in Europe makes it possible to get into touch with prospective clients most difficult to reach at home. After an ideal tour of several thousand miles through Europe the impression of the hirer is such that it should not be difficult for the home salesman to do business. A small number of sales have been effected in France, but these have been limited more by the inability of the factory to make deliveries than by the failure of the Paris manager to find business.

After Packard, the Pierce-Arrow Motor Car Co. opened a Paris depot with headquarters in the Avenue de la Grande-Armée. Manager Goodsill reports 175 Pierce cars on his books for the year ending September, 1912, this necessarily being below the total number in Europe, owing to the failure of many owners to report to the depot. The office supplies touring information, spares, undertakes repairs and generally looks after the interests of Pierce owners touring Europe. In view of the large number of applications for Pierce cars to hire for long or short distance touring in France, it is the intention to establish a rental department early next year. The only other firm maintaining a Paris depot is the Peerless company, which, while not running its own branch, has an agreement with the New York garage, in the Rue du Mont Thabor, to maintain a full stock of parts for Peerless owners.

Checking Tourists

Taking the figures given by the Packard and Pierce companies, adding to them 125 cars of all other makes, the total is 700 American high-grade cars touring in Europe during the present year. Four thousand dollars probably is a low average value for these cars, for in nearly every case they are the latest models with elaborate fittings. Even on this basis the total value of the cars is $2,800,000.

The French method of checking imports and exports is to give in the returns the value of all cars, whether brought into the country for permanent or temporary use, and to include those cars with the French exports when they leave the country. This makes the French returns, so far as America is concerned, of very little value. It is necessary only to compare the French exports with Switzerland's, which has a very low native purchasing power, with those to some other countries having no attraction for the tourist, to realize the misleading nature of these returns. The American export returns do not appear to be any more satisfactory, for in the $449,737 worth of cars sent into France during the last financial year must be included the value of that portion of the 700 tourists having disembarked their cars at a French port. English returns are much better in this respect, for they differentiate between permanent imports and cars brought into the country for re-exportation.

American Accessories Sell

The interest of the American accessory trade in the French market is mostly indirect. All the leading machine tool makers maintain their own establishment; the tire business has been represented for several years by the Goodrich company, which now has its own factory in the suburbs of Paris and controls a big slice of the French business; but the ordinary accessory manufacturer is represented by French agents. The only exceptions appears to be the Rushmore Lamp Co. and the Edison Battery Co., which have branch houses.

All American accessories adaptable to the needs of the European market find a ready sale in France, despite the duty imposed on them. American tools, in particular, have met with success. There appear to be possibilities of considerably increased business in American accessories on the French market; agents willing to take up the sale of these articles generally complain of the difficulties they have of getting in touch with the manufacturers.

An examination of the European situation shows that it is not worth while for any American manufacturer to confine himself to any one European country. England is distinctive, forming a market which can be treated independently of all others. A central office should be established—and France is well situated for this purpose—for the control of the whole of the business in continental Europe. Such

an office should be a branch of the home concern, appointing and controling its agents in just the same way as the factory controls its business in the various states of North America. The apparently simpler method of appointing an agent and leaving him to work out his own and the car's salvation or damnation has more often resulted in the latter than the former. There is an advantage in dealing with the countries of continental Europe as so many united states which is not obtained at home. Bad business in any one European country does not necessarily affect the others. Bad crops in Russia, for instance, do not entail poor motor car business in Germany. The present war between Turkey and Italy does not interfere with the business in Roumania. Even the combination of a slump, no show, and no races, in France—as occurred a few years ago, had no serious influence on the amount of business in other European countries.

FRENCH FIGURE CAR DEPRECIATION

Paris, Sept. 18—Motor car depreciation has been discussed by the members of the technical committee of the Automobile Club of France and five different methods of determining this depreciation have been classified. They are as follows:

French taxicab companies' method of writing off the complete value of the chassis in a period of 10 years.

The minister of war, in dealing with cars called up for army service, allows a depreciation of 33 per cent on the total value for the second, third and fourth years of service, and of 66 per cent for the following up to the tenth year of service.

M. Max Richard, of the technical committee, writes off the value in 7 years, as follows: 25, 20, 15, 10, 10, 10, 10 per cent.

M. Perissé, vice-president of the technical committee, writes off 20 per cent as soon as the car is put into service; 10 per cent of the reduced figure at the end of the first year; then 25 per cent of the non-depreciated value at the end of the 3 following years.

M. Leroux, another member of the committee, favors the following method: 20 per cent as soon as the car goes into service; 15 per cent at the end of the second year; 10 per cent for 4 years; 5 per cent during the 4 following years; the final value of the chassis is about 5 per cent of the cost price.

Bodywork is depreciated one-third as soon as put into service; at the end of the second and the 3 following years one-sixth and is considered of no commercial value after 5 years' service.

GERMANY'S CAR COUNT

Berlin, Sept. 29—According to official returns, the total number of motor vehicles of all kinds in use in Germany on January 1, 1912, was 70,006. These comprised 43,162 pleasure cars, 6,687 motor trucks, 20,000 motor bicycles, and 157 motor-driven tricars for business purposes. The figures show an increase of about 21 per cent in the number of motor-cars and a substantial decrease in the number of motor cycles. In the official returns it is stated that 37 per cent of the total number of vehicles are used entirely for pleasure purposes; 36.3 per cent are commercial vehicle; 11.2 per cent belong to doctors or other professional persons; and 15.2 per cent are motor buses or vehicles employed in the hiring business. The returns for the last 6 years to January 1 each year are as follows:

Date.	Motor-cycles.	Motor cars.	Tri-cars.	Motor trucks.	Total.
1907	15,700	10,115	254	957	27,026
1908	19,573	14,671	235	1,543	36,022
1909	20,928	18,547	248	2,004	41,727
1910	22,283	24,639	196	2,823	49,941
1911	20,584	32,894	121	4,206	57,805
1912	20,000	43,162	157	6,687	70,006

FRENCH HOLD BRAKE TESTS

Paris, Sept. 18—Official brake tests have been carried out by the technical committee of the Automobile Club of France, with a view to determining the distance and length of time necessary to stop a car traveling at a given speed. A straight stretch of road was marked with a number of posts placed at intervals of 100 meters, and carrying, respectively, the figures 1, 2, 3, 4, 5. The cars were given a run of 150 to 200 meters from the first post, an observer on board taking the time for this run.

As soon as the speed of the car had been determined, the observer gave the signal to stop by means of a bell, and at the same time allowed a bag of sand to drop to the ground. When the car was stopped, its distance from the bag of sand was measured, and the time of stoppage also was taken. The tests were carried out with two cars, one weighing 2,292 pounds empty and the other 3,086 pounds. The road surface was good macadam, slightly damp at the time of the trials. The results were as follows:

Type of car	No. of passengers	Total weight, pounds	Miles per hour at moment of braking	Length of time brakes applied seconds.	Distance covered under test, feet
Car A, 1 steel non-skid at rear	4	2,843	13.15	5⅖	75
"	4	2,843	22.1	8⅘	73.1
Car B, smooth tires on all wheels	4	3,637	20.9	5⅗	68.8
"	3	3,527	21.6	3⅘	76.4
"	3	3,527	21.7	3⅗	61.3
.....	3	3,527	27.6	4⅗	125.9

It is intended to continue the tests at a later date, making use of a large number of cars of very varied types.

SOUTH AMERICA IMPORTS TAXIS

New Orleans, La., Sept. 9—Taxicabs form a large percentage of the motor cars which are exported to Latin America through this port. With the increasing amount of smooth-surfaced streets in that section of the world, taxicabs are taking the place of the time-honored coach. In all Latin American cities the public coach service is an institution that was inaugurated shortly after the coming of the Spaniards and has flourished despite the advent of street cars and motor cars.

Coach fares are very cheap, being regulated by the municipal governments. The best coaches, really elegant equipages, are hired for 50 cents per hour, but the medium class, which is more generally used can be had for 37 cents an hour. This low rate has made it necessary to quote almost as low rates for taxicabs and as there is little variation in the coach rates throughout Latin America, it will be found that taxicabs usually may be had at a slightly higher rate than is charged for the first class coaches.

TYPICAL RETAIL SALESROOMS SUCH AS ARE FOUND IN EUROPE

Routes and

Motorists at Door of Yosemite Valley

By Paul Gyllstrom

SANTA BARBARA, Cal.—Editor Motor Age—After having been excluded for several years, the motor car is at the portals to the wonderful Yosemite valley, and the prospects are considered excellent that the demand for admittance will be granted. It will not come immediately but it is evident to any one who has studied the situation that it is only a matter of time when regulations will be so altered as to bring about a radical change in the Yosemite.

All interested in the present horse-drawn stages are opposed to the plan of admitting motor cars and the most radical are the picturesque stage drivers. But it is believed in certain quarters that the persons interested in the staging as an investment realize the trend of things, and in all probability they will prepare to meet any changes.

When the change comes it will be a radical one. Not only will the motor car be admitted to the valley, but because of the very nature of things the horse will have to be withdrawn and staging into the valley from Wawona, El Portal and Chinese camp will have to be by motor. The two can not be permitted to traverse these roads at the same time. It would be too dangerous. It must be remembered there are several hundred horses engaged in various work, including staging, that never have seen a motor car. In a city horses may be gradually broken to the car, but that can hardly be done on a stage road, where one frightened animal would cause a tragedy. There are very few sections of the roads leading into the valley that do not skirt dangerous places. The present antipathy to the car on the part of the stage drivers is so great that one probably would not hesitate to shoot down the driver of a car that dared pass the border line. And in view of the great danger to passengers, at present he would be warranted in taking drastic action, some think.

The sensible system in opening the doors to the motor car would appear to be to set a certain date when they would be admitted. That day should be so far ahead that the staging companies could have sufficient time in which to dispose of their stock and provide for staging by motor. Having barns at terminals the companies consequently have good locations for garages.

Also, before motor cars can be admitted, the government will have to expend a considerable sum on the improvement of the approaches to the valley. In many places they will have to be widened and provisions made for passing places. That probably would not be a serious situation under present conditions, as there are many mountain passes in the west traversed by motor cars that are in poorer condition than the roads leading to the Yosemite. But the rush into the valley during the summer months would be so great that it would seem wise to take every precaution against accidents.

Motor cars were allowed into the valley while the park was under the jurisdiction of the state of California. But the state turned the park over to the government when motoring still was in its infancy and the staging traffic had not grown to its present proportions. But the government immediately barred the car.

Outside of the staging interests the car is favored. Persons who have concessions in the valley realize business will be increased. Tourists, who have made the trip in one would be glad to know that on a second trip they could be rushed from the edge of the

THIS ROAD LOOKING TOWARDS CATHEDRAL ROCKS HAS BEEN PARTLY IMPROVED BY THE GOVERNMENT

Touring Information

Growing Demand for Car Admission

park to this extraordinary playground expeditiously and without the present dust annoyance.

From El Portal to Camp Curry, at the eastern end of the floor of the valley, is a climb of nearly 2,000 feet in a distance of 16 miles. The stages cover the distance nearly to the minute on the established schedule of 4 hours. The first stage leaves El Portal at 7 o'clock in the morning. The government sprinkles the road, but the workmen do not come out with the peep of dawn and very few stations have been wetted down when this stage passes over the road. The result is that the horses kick up such a dust that the passengers are enwrapped in it pretty much, according to the whims of the breeze. It is true dusters are provided, but that only helps some.

A large passenger-carrying motor car could easily cover this distance in safety in an hour and a half. In fact most of the 8-mile stretch within the valley, which is 4,000 feet above sea level, could be whisked over very rapidly, but as cars would be very common it would be wise to establish low speed regulations.

El Portal road would be the easiest for the motor to travel, and this point is now reached from the outside without stopping the car. Cars also run to Wawona and Chinese camp, each about 30 miles from the valley. But both roads are simply widened trails that have to make the descent into the valley. That from Wawona is by way of Inspiration point, which is 1,500 feet above the floor, thence 3 miles to the floor.

The advent of the motor would not mean the withdrawal of all horses from the valley. Pack horses and mules would continue to be a necessity for trail work. The climbs from the floor to the edge of the valley is so great that only the hardier attempt them by foot.

Glacier Point is one of the vantage view points at the rim of the valley. This is a sheer rise just above Camp Curry. But it can best be reached by an 11-mile trail that leads by Vernal and Nevada Falls and other scenic spots. The admittance of the motor car probably would create a greater demand for trail animals because of the increase in business, a fact which does not appear to be appreciated by the staging interest that oppose the car. There is now a close relationship between the different concerns engaged in this business.

There are now about 400 animals engaged on the traffic that concerns the Yosemite valley. About 200 are used on the stages, while the others are used for rigs to take visitors about on the floor; and on the trails. The number used on the trails are, however, greatly in the minority at present, burros being largely used.

One reason the tourist will favor the motor car, will be because of the reduced cost. The rate varies from $2 to $7.50 each way. The company charges $15 from the valley to Wawona and then back to El Portal, a total distance of about 50 miles.

There are about 20 miles of roads on the floor of the valley, which is as level as a prairie. There is a road leading down on each side of the valley, a total of 16 miles. The valley is about a mile wide and there are a few cross roads and laterals. The roads at the entrances to the valley, past Bridal Veil Falls on the south and El Capitan and Yosemite Falls on the north, are in fair condition up to the village which is in about the center of the valley. Beyond the village the roads are very dusty and never sprinkled.

Although the sprinkling is in charge of the government, it appears a bit odd that this

YOSEMITE PARK SHOWING THE NORTH DOME, WHICH IS 3,725 FEET ABOVE THE VALLEY

is not more general. A start has been made by the government to improve the roads and the foundation was laid for a mile stretch when something went wrong with the stone crusher and the work has lagged several months.

The best kind of road material is right at hand, as the entire formation is granite. Some is of the disintegrating sort, but there are vast quantities of rock hard as flint.

One of the earnest advocates of opening the valley to motor car is Samuel Hill, of Seattle. Mr. Hill, who is a son-in-law of James J. Hill, the railway magnate, recently visited the valley. He ran his car to Chinese camp and from there took the stage. Upon returning to San Francisco, he commented upon the wonders of the valley and at the same time deplored the fact that motor cars were excluded. But he also observed that the government would soon have to heed the general demand.

It was officially stated that about 10,000 persons visited the Yosemite valley last year, with the prospects of the number being a little smaller this year. Last year was probably the banner one in the history of the valley, having gradually increased the last 10 years. Using these figures as a basis it is safe to say that since the advent of the white man to the region not more than one quarter of a million persons have been in the Yosemite valley.

VIEW FROM ARTIST'S POINT, WITH EL CAPITAN TO THE LEFT

Road Directions for Motor Age Readers

MOTORING TO ALABAMA

BROOKVILLE, PA.—Editor Motor Age—Kindly inform me of the best route from here to Birmingham, Ala., by way of Cincinnati, O. How much mileage should a 30-horsepower E-M-F roadster get on 1 gallon of gasoline?—Fred Knapp.

First go to Reynoldsville, Rathmel and Luthersburg, 15 miles, then to Pittsburgh 103 miles through hilly country and over some rough roads, but still the best. The towns are Big Run, Punxsutawney, Trade City, Smicksburg, Rural Valley, Kittanning, Sintelick, Freeport, Tarentum, Springdale, Red Raven, Aspinwall, and Pittsburgh.

It is 190 miles to Columbus, O., through Carnegie, Bridgeville, Canonsburg, Washington, Pa., and the National highway passing Claysville, Elm Grove, Wheeling, Bridgeport, St. Clairsville, Loydsville, Morristown, Hendricksburg, Fairview, Elizabethtown, Washington, Cambridge, New Concord, Norwich, Zanesville, Mt. Sterling, Gratiot, Linnville, Jacktown, Kirksville, Etna, and Reynoldsville.

There is a good road through Chadville, Bloomfield, Circleville, Williamsport, Washington Court House, Sabina, Wilmington, Clarksville, Morrow, Foster's crossing, Montgomery, Silverton, and Cincinnati. This is a distance of 124 miles.

It is an enjoyable 119 miles to Cincinnati through Hawthorne, New Palestine, Fountaintown, Gwynneville, Arlington, Rushville, Connersville, Evarton, Blooming Grove, Brookville, Cedar Grove, New Trenton, Harrison, Miamitown, Cheviot, Westwood and Cincinnati. Another beautiful stretch, particularly so in the fall, is to Louisville, 135 miles, by way of Cleves, Elizabethtown, Lawrenceburg, Aurora, Rising Sun, Oberdeen, Markland, Vevay, Carrollton, New Castle, Shelbyville, Simpsonville, Middletown, St. Mathews, and Louisville.

The answer to the Saginaw, Mich., inquiry will serve you to Columbia, Tenn., from which point you route directly south to Birmingham, Ala., 177 miles, through Pulaski, Elkmont, Blowing Springs Hollow, Athens, ferry to Decatur, thence on to New Decatur, Flint, Hartsells, Falkville, Lacon, Cullman, Hanceville, Garden City, Bangor, Blount Springs, Warrior, Kimbery, Morris, Gardendale, Louisburg, Artesia Springs and Birmingham.

By following out the itinerary given to an inquirer from Milwaukee, Wis., last week, you will have the balance of your routing to Birmingham.

One gallon of gasoline is supposed to give something like 18 miles.

SAGINAW, MICH.-NEW ORLEANS.

Saginaw, Mich.—Editor Motor Age—What is the best route to New Orleans, La., also condition of roads in general.—R. M. McAvoy.

Saginaw to Detroit is 93 miles and a good road of macadam or gravel through Bridgeport, Pine Run, Mt. Morris, Flint, Waterford, Pontiac, and Birmingham. The itinerary for the National tour this year can be followed out for the most part, although for better roads a few changes are advisable. The objectionable piece of road is in Kentucky and although only a short distance from Buffalo to Nashville, Tenn., it is terrible with continuous change from deep sand to large boulders and cobblestones between Magnolia and Green river. There is another road that can be taken through Kentucky and is reached through Paducah, Ky., and is all natural dirt roads, some fording has to be done and ferries resorted to. In wet weather it is all slippery clay soil and quite impossible going in several places.

About the best thing to do is to send the car by rail from Cave City to Nashville, Tenn., and not risk the price of a new set of tires or a spoiled disposition.

To finish the first day's run you will travel through Dearborn, Wayne, Ypsilanti, Saline, Clinton, Tecumseh, Adrian, Madison, Jasper Lyons, Winameg, Wauseon, Archbold, Stryker and Bryan, making the mileage 215 miles. This would necessitate an early start and no time allowed for sight-seeing in Detroit.

Next in order is Hicksville, Maysville, Fort Wayne, Bluffton, Petroleum, Penville, Redkey, Fairview, Albany, Muncie, Anderson, Pendleton, Greenfield, Indianapolis, and this leg is 185 miles.

Who Have Asked Route Information

Traveling over the best roads, Louisville is reached through Southport, Greenwood, Franklin, Amity, Taylorville, Columbus, Walesboro, Waynesville, Jonesboro, Seymour, Brownstown, Vallonia, Kossuth, Salem, Pekin, Borden, Bennettsville, Smith, New Albany, and long toll bridge over the Ohio river in Louisville. This stretch is only 134 miles and can be taken leisurely, with plenty of time to stop for beauty spots.

The Blue Book car has just returned from a trip through this country with up-to-date road reports, and Buffalo, Ky., can be easily made through Mount Washington, Bardstown, and New Haven, 69 miles.

Nashville, Tenn., to Tuscumbia, Ala., is 122 miles and the towns are Brentwood, Spring Hill, Neapolis, Columbia, Ridley, Mt. Pleasant, Sandy Hook, Williamsville, Crestview, Summertown, Lawrenceburg, Dunn, Pleasant Point, Loretto, Green Hill, Ala., St. Florian, Florence, and Sheffield, with something like 10 tolls to pay.

WHERE THE COULTERVILLE MEETS EL PORTAL ROAD AT YOSEMITE

Going west to Memphis, 160 miles, the routing to Barton, Cherokee, Iuka, Miss., Burnsville, Corinth, Essary Springs, Tenn., Saulsbury, Grand Junction, La Grange, Moscow, Piperton, Collierville, Germantown, and Memphis.

It is 120 miles to Sumner, Miss., through Lynchburg, Glover, Lake Cormorant, Clacks, Robinsonville, Hollywood, Tunica, Clayton, Dundee, Rich, Coahoma, Cloverhill, Clarksdale, Tutwiler, Sumner; then 165 miles to Jackson through Whitehead, Glendora, Schlater, Greenwood, Lexington, Franklin, Goodman, Pickens, Canton, Madison, Ridgeland; Jackson to Baton Rouge, La., is 179 miles, and the towns between Terry, Crystal Springs, Hazlehurst, Beauregard, Brookhaven, Johnston, Magnolia, Osyka, Kentwood, Greensburg, and Baton Rouge. Following along the Mississippi river 119 miles is the last stretch, the routing being Darrow, La Place and Kenner.

After you leave the Indiana state line you will not find many stretches of fast road for any great distance. There will be a stretch of poor dirt, then very good, and so on, but the scenery always attractive.

EASTERN ROAD REPORTS

The Blue Book Car for the Touring Club of America has been surveying the roads in Western Maryland, to Baltimore, Washington and in Virginia, and their latest reports indicate that there will be no difficulty in traveling to Washington this fall over the routes as shown in the Blue Book.

Some changes were made necessary by road improvement and several new routes were charted to connect up with the trunk lines, lessening the mileage between New York and Baltimore.

The road from New York to Trenton is in good condition. At the Jersey State capital tourists should take Blue Book Route 164 to La Trappe following the new route to Hatboro, Ambler, Norristown and Coatesville. From this point there is a good dirt and macadam road leading southwest from Coatesville to Conowingo, a distance of 38.4 miles.

From Conowingo the route goes through Belair and Lochraven on Blue Book Route 274, a distance of 45.2 miles, making the total mileage from New York to Baltimore 196⅓ miles, as compared with the old route through Philadelphia and Newark, which is longer and vastly inferior in quality.

Philadelphia motorists can use the Coatesville route, as there are no places on this stretch as bad as on the road by the way of Chester and Wilmington, although it is fifteen miles longer.

This route will be recommended to motorists en route from New York, south through to Baltimore and Washington, as it will afford the best roads to the national capital for another year.

Between Baltimore and Annapolis the scouts advise that the best exit from Baltimore is through Wilkes avenue, out Charles street; after crossing the Light street bridge there is a good macadam road all the way to Annapolis. At this point a boat may be taken for Clayborn and the eastern shore, where is a popular rendezvous for local motorists on account of the good accommodations there.

A new route was laid out between Lancaster and Conowingo, which makes a connecting link for tourists en route to Baltimore and Washington from the north via Harrisburg or Reading. This is a good dirt road, with stretches of macadam covering a distance of about thirty-one miles. This route is recommended in preference to the York-Baltimore pike, which is reported in poor condition.

GOING NORTH FROM MEMPHIS

Martinsville, Ill.—Editor Motor Age—Please outline the best route and give mileage for a motor car trip from Memphis, Tenn., to Martinsville.—L. Wells.

About the best road offered you is into Arkansas to Forest City, 49 miles through Mound City, Marion and Madison, over very poor sand and dirt roads, then 70 miles north to Jonesboro over clay and gravel roads through Colt, Wynne, Whitehall, Harrisburg and Greenfield. Cape Girardeau, Mo., is a distance of 154 miles over gravel and dirt roads through Brookland, Paragould, Marmaduke, Rector, Piggott, St Francis, Campbell, Dexter, Bloomfield, Aquilla, Allenville and Dutchtown. Go through Jackson, Fruitland, Appleton, Uniontown, Longtown, Perryville, Lithium and Clary 52 miles to the Mississippi river, crossing to Chester, Ill., and routing through Centralia, Salem, Omega, Farina, Laclede, Edgewood, Mason, Watson, Effingham, Teutopolis, Woodbury, Jewett, Vevay, Casey, Oakleaf and Martinsville. From Chester to Martinsville the roads are natural dirt and the distance is in the neighborhood of 164 miles.

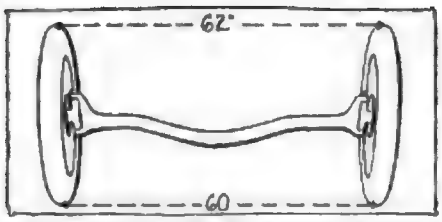


FIG. 1—FRONT VIEW OF SPREAD WHEELS

The Readers

How Increase of Camber and Loss of Gather Affects Wear of Tires—Term Stock Cars Is Strict, Stock Chassis More Flexible—Carpenter Is Questioned

Lining Up Front Wheels

Georgian's Tires Grind and Wear Off Tread Because of Misalignment of Wheels

MADISON, Ga.—Editor Motor Age—Will Motor Age please tell me what is meant by the front wheels of a motor car being in line or alignment? My car, a Buick 1912, model 35, dropped in a ditch 10 inches deep and bent the steering rods under the car. Then the rubber on the treads of the wheels wore away soon. Now they say the front wheels are out of line. I put in a new steering arm as I though it was bent, but I see no difference. Now all rods are straight, what am I to do? This is the position of the wheels—See Figs. 1 and 2.

Now when I draw in the rear rims of the front wheels to 60 inches, it throws the front rims of the front wheels about 1 inch wider than the rear portions, making the wheels 60 inches apart behind, and 62 inches apart in the front of the wheels.

It seems to me that I read somewhere that the front wheels should be at least 3 inches wider angle than the rear wheels, am I right? It seems impossible in my car to place the front wheels 60 inches apart for both the front and rear of the wheels, i. e.—I can't make them both the same, if they should be the same. What is my trouble? The axle does not seem to be bent. It is a tubular axle. I can change the position of the front wheels by shortening or lengthening the connecting rod under the car. Should the rear and the front wheels be the same distance apart, or not?—A Subscriber.

To properly understand the following explanation, an understanding of the principle of camber and gather is first of all essential, and to this end, Motor Age would advise that you read the answer to J. W. on page 26, first column of the issue of September 26. According to your diagrams, your wheels are spraddling out, which results in a grinding of the tread. This is because your front wheels are cambered, i. e.—their lowermost portions are closer together than their uppermost portions. This gives them a tendency to run away from each other, or in other words, their true tracks diverge, if set parallel. To correct this tendency, they should be set at a gather, viz.—their front portions set closer together than their rear portions, this brings their tracks parallel. The result is that while

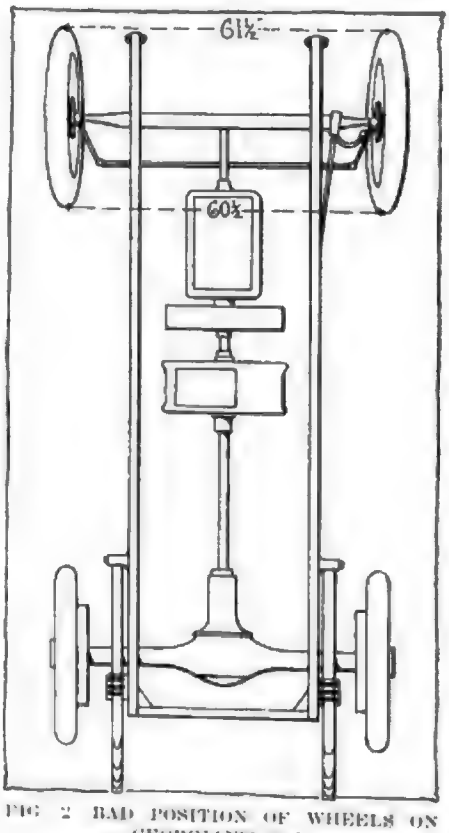


FIG. 2 BAD POSITION OF WHEELS ON GEORGIAN'S CAR

the wheels themselves are parallel in no particular, their paths of rolling are, and the result is that they travel naturally in a straight line, with a true rolling contact with the road, and do not grind the tires. If on the other hand they are set with a spraddle, the effect will be to aggravate the grinding tendency that is present when they are set straight. The rear wheels, you have noticed, are set parallel as in Fig. 4. This is right, as they turn on a common axis, without camber, so that they run in a straight line when set parallel. Referring to Fig. 3, it will be seen that the front wheels are actually wider apart at their centers than the rear wheels, and that their spread is greater. Owing to their camber, and the disposition of the steering knuckles, they nevertheless travel in the same track as the rear wheels. The gather of the front wheels brings their rear portions wider apart, so that while the fronts of the wheels are 60 inches apart, the rear portions of the tires are 62 inches apart. This is the ideal setting for front wheels, viz.—the gather equal to the tread of the wheels, so that the wheel leads in lines parallel to the track. This disposition is shown in Figs. 3 and 5.

To correct your fault, first see that the track of the front wheels is 60 inches. Next, with the aid of a carpenter's large square or a plumb line, see that the wheels are of equal camber. To do this the car must be on a level floor, and both tires applied and fully inflated. It being determined that the axle itself is true, the next step is to turn the wheels to a position, as near as can be judged, dead ahead. Then adjust the length of the drag link, or tie rod so that the wheels are 60 inches apart in front and 62 inches apart in the rear. To determine whether or not the wheels are gathered equally, with a rod or tape measure see that the front portions of the tires are at equal distances from the tread point of the opposite tire. If not, this adjustment may be made by adjusting the length of the longitudinal steering rod.

This adjustment will give you a perfectly true running pair of wheels, which will steer freely, and run with a true road contact, although such a setting will be rather more radical than was intended on your car. The correct angle for the Buick 35 is with only ⅝ inch difference in width between centers of the tire at the top and bottom, and the front and rear, respectively, or in other words, between the wheel track and the wheel spread. Your trouble is that your spindles have become bent downwardly thus increasing your camber, and throwing the gather out of adjustment. This may be corrected by bending the axle back to its original shape with the top portions of the wheels ⅜ inch wider apart than the tread portions, or by the above process, readjusting for the increased camber. In any event, the wheel must lead in a true plane, or in other words, the center of the front of the wheels must be equidistant with the centers of the tread portions, as shown in the diagram, Fig. 6.

DEFINITION OF STOCK CARS

Garwin, Ia. Editor Motor Age—Are the materials used in the motors, transmissions, axles, wheels, frames, etc., of the stock cars in road races of the same material as used in the cars purchased by the public? Also, are the magnetos and carbureters specially built?

Clearing House

Benzine a Good Fuel—Cheap and Effective Tappet Adjustment on Ford—Duryea the Genesis of Sixes—How Minnesotan Fixes Tire Pump

2—Could a young man, if he proved competent, secure a position as tester in a factory without having to work up to that position?—A Subscriber.

1—The term stock has a definite meaning that is generally understood. Under the A. A. A. rules, a stock car is allowed no changes whatever from standard practice. Stock chassis, however, are not restricted so severely. The definition of a stock chassis under the A. A. A. rules, which is adhered to in all contests sanctioned by that body, admits of changes in the weight and thickness of springs, but restricts their length and breadth to standard; of piston diameter; of the angle of the steering post; length and angle of control levers; change of gear ratio, wheel diameters excepted; tire and rim equipment; length of pedals; body, fuel tanks; exhaust piping; the use of shock absorbers; winding of springs; hoods may be cut away; mud guards and radiator fenders; and changes in lubrication. Magnetos and carbureters are not exempt.

2—In the first place, no man is competent to act as a tester of motor cars without considerable experience in driving, and a great deal in the manufacturing of the particular machine which he is to test. So intimately connected are the duties of the assembler and the tester, that in many factories, even those whose employes number into the hundreds, prefer to have the assemblers test the cars personally, instead of trusting them to a disinterested tester.

BENZINE FOR THE CAR

Sylvania, Ga.—Editor Motor Age—What is the gear ratio of the White gasoline, 1910 model, in third and fourth speeds?

2—If the White car is able to do 50 miles per hour as a stock car, what should it do stripped?

3—What is the horsepower of the White car?

4—Can I successfully use benzine as a fuel? Is it more dangerous than gasoline?

5—What changes do I have to make?

6—Give names of several concerns from which I may obtain small bucket seats and round gasoline tank.—Geo. H. Hilton.

1—The 1910 White gasoline car was geared at 4.25 to 1 on third speed or direct drive, and 3.45 on fourth speed.

2—The highest recorded speed of a stock White chassis, stripped for racing is 55 miles per hour, which was done by a 30 in 1910.

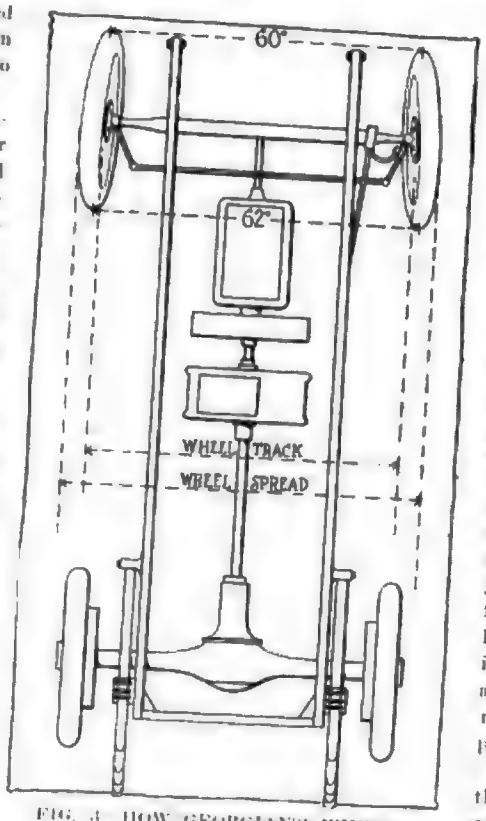


FIG. 3—HOW GEORGIAN'S WHEELS SHOULD BE LINED UP

3—At 1,000 revolutions per minute, the 30 develops 25 brake horsepower; the 40, shows 35; and the 60, 32 horsepower.

4—Benzine may be successfully used, under proper conditions, for a motor fuel. It is less dangerous than gasoline, as it is a heavier and less volatile distillate of petroleum.

5—The only changes necessary are adjustments, to adapt the carbureter to the difference in viscosity of the new fuel, and its slightly lower fuel intensity. Only the most advanced types of water jacketed carbureters are adapted, however, to satisfactory service with this fuel.

6—The Times Square Automobile Co., Chicago; the Chicago Coach and Carriage Co., Chicago.

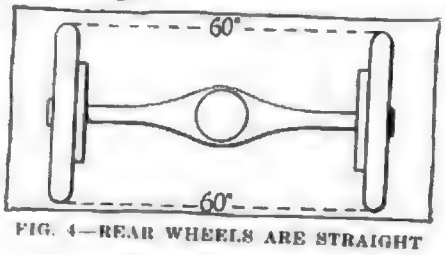


FIG. 4—REAR WHEELS ARE STRAIGHT

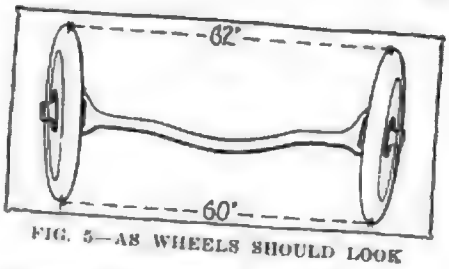


FIG. 5—AS WHEELS SHOULD LOOK

Repairing a Tire Pump

Sauk Center Sage Finds the Tire Pump Is Easy To Fix After Analytical Diagnosis

SAUK CENTER, Minn.—Editor Motor Age—Did you ever undertake to repair a tire pump when it would put only about 1 pound of air into a tire with about fifteen strokes to get the pound? Well, I guess not! The other day my tire got a little below pressure mark, and I tried to pump it up to standard. I used all the tricks known to me in the pump line and I could not get that pump to pump. I nearly broke my back, and finally gave in. I decided to take the pump to a garage and either trade it off or get it repaired so it would put air in a tire. I took it to the repair man and meekly asked if he knew anything about a compound pump. He briskly informed me that he was on his job in this respect. He took the pump from my hand and with an air of supreme knowledge said: "I think there is nothing wrong with this pump, unless it needs a new leather. However, I will trade this new one, compound, for $3 and your pump."

This struck me as fair ,and I called for the new pump, but on looking it over I concluded it was not as good make as the one I now owned, and which cost new just $5 and had done good work until of late. So I concluded I would have him repair my pump. After working about 2 hours to fix it up he, with the air of a commanding general, said: "It will do business now, you bet." He handed me the pump and I, being a trifle suspicious of the medicine he had given the compound, asked him to try it on a car standing by with the tire partly down. He promptly complied with my request with results surprising to himself.

Before connecting the pump he tested the tire with a gauge and found it had 45 pounds of air in it. Then he connected the pump and gave it about fifty strokes, disconnected and tested, and found he had 45 pounds of air in the tire! He looked at the pump a moment and said: "You had better throw this thing away and buy a new pump. I won't bother with it longer." I meekly asked how much I owed him, and he informed me that the munificent sum of 25 cents would settle the bill, inasmuch as he had not done the pump much good.

I paid the sum asked and taking the pump home with me concluded: "What

man had done, man could do," if someone had invented this pump and made it work I could do the same thing. I took it apart and found: One steel ball with brass spring to hold it in place; one steel washer; one big leather washer and plunger; one steel washer; one cap nut, brass, to hold the ball and brass spring in place; one telescope brass tube, threaded on both ends to screw into the foot; one thick leather washer for cushion on inside of foot; one cone of brass, with male and female threads, with four ⅛-inch holes drilled in it, with a slit across the top to turn out the male bushing which held a thin leather washer in place.

I carefully made a note of the power required to force the air into the rubber hose and from there to the tire and noted that the down pressure of the plunger tube to which the handle was attached forced the air admitted at the top, into and up to the ball-valve, which was held by a check spring. I then looked over the center washer held between the male and female bushings and found my trouble.

This thin leather washer was worn so badly that as the up stroke of the pump was made it did not sufficiently close the four holes in the bottom part of the female bushing to permit the air gathered on the down stroke to be forced into the inside brass tube and from there into the tire. I had quite a time to get this bushing apart, but succeeded at last, and I put in place of the worn old washer a good new one, replaced all parts as they were and going to my tire found I could get 1 pound of air into it with just two strokes. A pump is a small thing, indeed, nevertheless it should be perfectly understood, as there is something wrong inside when it won't work.—A. D. Carpenter.

SPARK PLUG CEMENT

Parkston, S. D.—Editor Motor Age—Kindly publish a formula for a cement for pipe connections and spark plugs that will withstand heat and compression will dry without heating.—E. G. Meisenhoelder.

The following formula was published in Motor Age August 29, 1912: "A fireproof cement that becomes very hard when heated is prepared by mixing 180 parts of iron fillings, forty-five parts of lime, and eight parts of common salt, working the ingredients into a paste with strong vinegar. The cement should be perfectly air-dried before heating."

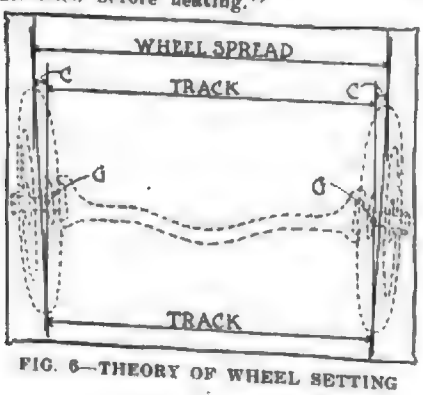


FIG. 6—THEORY OF WHEEL SETTING

Reader Discusses Editorial

Doctor Finds that Comments of Motor Age on Reform of Service to Users of Cars Are Timely

MOLINE, Ill.—Editor Motor Age—Just to reinforce the editorials in the last two issues of Motor Age of September 12 and 19 on "Service Reform Needed" and "Tribulationes De Minutiis," I would like to submit a few more very pertinent illustrations. Service reform is needed. After running a new car for 2 months an owner found that the carbureter leaked badly and continually. An examination showed that the cork float had been poorly shellacked and had no longer enough buoyancy to shut off the flow of gasoline. An order for a new float took 11 days to fill. An order for two new fenders took 2 weeks to fill. An order for a new brake rod took 9 days to fill. An order for a new spring took 7 days to fill.

All these were simple parts requiring no complicated machining or adjusting; they were all ordered by telegraph from a Chicago branch house that supposedly carries a full stock of spare parts.

And the "tribulationes de minutiis!" Having bought a new car in the spring, the owner, a few days before it was delivered to him, sprained his wrist badly in a fall and consequently was unable to drive for awhile. Not being by any means a novice, he made use of this enforced idleness to inspect the new car thoroughly. Here is what he found to bear out the contention of Motor Age that "at the final testing department of the factory, with the customary American rush, the car equipment is marshaled into place with the speed of a military maneuver:"

1—The lock nut and washer on one of the torsion rods were fully ½ inch from where they belonged, and were stuck fast in the paint:

2—The cross pieces on both the rear fender supports were cracked:

3—When stepping on the running board a sharp squeak in the hangers of one front and one rear spring was noticed.

4—The tire irons were large enough to hold a flat tire, but too narrow to hold an inflated one.

5—A leaky joint was found in the hot water connection of the carbureter.

6—The floor of the tool box under one of the seats was littered with tags, cushion hair, wood shavings and dried paint.

The first few days he was able to take the car out he ran down the following troubles:

1—The foot brake on both rear wheels was dragging.

2—A very distinct and disagreeable buzzing was heard in the timing gears.

3—The same noise was found in the rear axle.

4—The cover in the filler cap of the gasoline tank was leaking, due to a defective screw thread.

5—The clutch pedal made a sharp grinding noise caused by its rubbing against one side of the too narrow slot.

Comment seems superfluous, except for the remark that a factory inspector with ordinary alertness and business judgment could and should avoid these defects. They create unnecessary trouble and dissatisfaction for an experienced driver and with a novice at the wheel some of these defects would surely have gone undetected until they have led to serious consequences.—Doctor.

ABSENCE OF SPARK KNOCK

Greenfield, Tenn.—Editor Motor Age—I recently drove a model Y Stevens-Duryea car some 6,000 miles over all kinds of roads without ever hearing a knock or pound in the motor, although frequently the car was slowed down on heavy grades or in deep sand to a very slow speed. There was no spark or preignition knock at any time even though the spark lever was carried well up toward the top of the quadrant at all times. A model M Chalmers 30, driven over the same roads pounds quickly unless the spark and throttle are carefully manipulated. The spark must be retarded on ascending slight grades and whenever the grade taxes the power of the motor the knocking continues even with the spark fully retarded. In both motors the timing and valve setting was done at the factory. Can Motor Age explain the difference in action of these motors?

2—When a motor pulling a moderate grade gives a preignition or spark knock with spark lever fully retarded, a knock that disappears when the throttle is closed a little, is it not an evidence that the compression carried is too high to get the highest torque at low speeds?

3—Instruction books generally speak of a knock that occurs when the motor is overtaxed, as in ascending a heavy grade. Is this knock due to preignition induced by high compression? —Harry C. Ward.

1—In comparing the behavior of two motors in this respect, it must first be remembered that the position of the spark lever is no indication of the actual position of the timing. The timing of your Stevens-Duryea may be a trifle late, and that of the Chalmers a trifle early in similar spark-lever positions. Your gear may be lower than that of the other car, and the fact that your motor is higher powered, and is a six, probably has an influence in the difference in performance.

If the spark is properly timed, and cylinders free of carbon, the Chalmers motor should prove more flexible than your report seems to indicate. A spark knock on a fully retarded spark indicates one of two things, all other engine parts functioning normally, either that the timing is excessively early, or that there is a considerable carbon deposit. High com-

pression might produce preignition, but it is to be doubted that any motor car motor could reach such a degree of compression, certainly not a standard motor such as the Chalmers. If the gear ratio on the Chalmers is too high for the weight of the body and load, it is possible that the overtaxing of the motor in this way would produce preignition under load, but with a fully retarded spark, this is doubtful.

2—The phenomenon of spark knocks with a late spark and open throttle is to be traced to the combination of early spark timing, and the natural suppression of the motor due to undue throttle openings at low speeds. With the spark retarded, it is evident that the motor would be running slowly. A wide-open throttle at such a speed would choke off the motor. This choking would further reduce the speed, so that the abnormally early spark on full retard would cause ignition to take place before dead center.

Of course late exhaust valves would have the same effect, but it is not likely that these would be set wrong at the factory, and unless changed subsequently, they could not get out of time unless as a result of excessive cam wear. The effect of the high compression for low speeds that results from excessive throttle openings, is to increase the speed of the motor, rather than retard it.

3—No. It is due to decreased speed which renders the spark, normally right, too early. With a properly timed engine, however, this knock could not occur with the spark retarded, except on the dying revolutions of the engine, except through carbon deposit or overheat. Compression sufficient to ignite a charge of gas would have to reach a degree in excess of 400 pounds to the square inch. Compression in a motor car motor rarely exceeds 80.

FORD PUSHROD TAKE-UP

Grinnell, Iowa—Editor Motor Age—Kindly explain how to adjust Ford pushrods.

2. I have an Apple charging dynamo which refuses to work; at times it starts and charges for a second then stops as suddenly as it began. What is the trouble?

3. Give me some rules for charging storage batteries.—J. A. Hamor.

1. The Ford pushrods have no adjustment. To take up play the Ford Company has provided a means to this end consisting of little steel caps to be fitted over their ends. These will be furnished to Ford owners at the Chicago branch, gratis, on application.

2. The Apple Electric Co. advize that you correspond with them in regard to your difficulty. Their address is Dayton, Ohio.

3. Complete instructions for the charging of storage batteries was published in these columns, Aug. 15, 1912, under the title, "Charging with Exciter." These instructions were general in their scope, and will serve for any current source.

Likes Irreversible Gear

Pennsylvania Motorist Attacks Position of Gopher Expert Regarding Steering Gear Types

DU BOIS, Pa.—Editor Motor Age—I was very much surprised to see in Motor Age, September 26, an article by A. D. Carpenter in which he claims the superiority of the reversible type steering gear over the irreversible. I had thought Mr. Carpenter with his 8 years experience would be better able to judge the different types than it now seems.

I am presuming that in buying his first car it was medium in both price and weight. After selling this car, with which he learned and had some experience, a small car was bought. Better service is being returned from this car due to the excellent care it is receiving. Probably if this light car had been bought first the story would be entirely different, but it is needless to say that Mr. Carpenter never has recovered from that first car and judges all others by it.

The advantages of the irreversible steering gear are so apparent that it is hardly worth while enumerating them, but fearing that some motorists may not be familiar with the different types, I am going to answer this article.

The irreversible steering gear is used by more manufacturers than any other type, only the cheap cars using the reversible due to its cheapness in manufacturing. The competition in the cheap-car field is so great that it is a question of cost and not of which contains the most advantages.

Irreversible steering gears are constructed with adjustments for taking up lost motion and wear, it never being necessary to have lost motion in the steering wheel. This most likely was overlooked in Mr. Carpenter's first car or the steering gear was of such an antiquated type that its comparison with the ones we now have is useless.

The reversible type is a little the quicker if we wish to figure in the one thousandth part of a second, but there is such a thing as being too quick in regards to tire and machine wear. The irreversible type is sufficiently quick-acting for any one and never has been blamed for accidents caused by slowness to work. A well-lubricated gear will work with very little more effort and the difference in muscular energy required is so slight it is not worth speaking of.

In the high-priced cars we have combinations of the best types known to manufacturers. Why if the reversible type is the best do we not see just one high-priced car equipped with it? High-priced cars are equipped exclusively with irreversible steering gear. To say that this type of gear is complicated, awkward and heavy is only stating one's unfamiliarity with it, for to the contrary it is very simple, compact and the difference in weight is really a joke.

Mr. Carpenter says that running in ruts and car tracks can only successfully be accomplished with his favorite type. Running in ruts never should be done as it works great injuries to tires. If the roads are so rough one is unable to straddle the ruts, then they are entirely too rough for motor use. Never should one drive in the car tracks, as the small steel shavings from the rails ruin tires the quickest of any abuse. Considering this, I hardly would call it an advantage in favor of this type.

The lubrication of steering gears is neglected more than any other part of the car, and I am sure any faults found with them are due directly to this neglect.

The great feature of the irreversible steering gear is that none of the road shocks are transmitted to the driver's arms. Mr. Carpenter likens his type to a bicycle which one may ride on a smooth road without touching the handlebars, but he fails to state that the first inequality in the road will land the rider in the ditch. Each shock given to a wheel with a reversible steering gear is felt in the driver's arms and is the reason for drivers becoming tired much quicker with this type than the other. In striking an obstruction in the road with an irreversible steering gear there is no danger of the wheel being jerked from one's hands, which is not true of the reversible, hence the superior safety of the former.

I have driven cars of all models and types since 1902 and my preference at all times is an irreversible steering gear.—W. J. Marlin.

AMERICA'S PIONEER SIX

Prescott, Iowa.—Editor Motor Age—There has been so much discussion regarding the first motor car company to adopt a six-cylinder motor that I would like to be enlightened on the subject.—W. H. Hackler.

Claim is made, and few dispute it, that the first six-cylinder motor car made in this country is the idea of Hinsdale Smith, of the Springfield Metal Body Co., Springfield, Mass., a concern which originally made metal cornices. Mr. Smith built the engine in 1904, and at that time it is said did not have enough money to buy a body for it. Because of this lack of finances, Smith constructed a metal body for the car which, by the way, is said to have been the origin of the metal body business in this country. Frank Duryea, of the Stevens-Duryea company, saw Smith's car in operation on the road, and through his endeavors the Stevens-Duryea company brought out this first six-cylinder in the fall of 1905. Hardly had the new Stevens been out than Henry Ford took a liking to the six and the six-cylinder Ford was introduced to the market in 1906, being followed a few months later by the National six and Pierce six.

urer; A. E. Lerche, L. J. Spear, T. B. Gilbert, C. A. L. Wright, G. F. Reed, H. L. Sprague, E. F. Stearns, W. J. Hyland, H. Cave, F. W. S. King, H. E. Corey, F. W. Gumble and E. F. Davis, board of directors.

New Use for Car—L. L. Harmon, a stockman of the Camp Wood country, Arizona, has found a new use for his car. He is using the machine to haul cattle out of bogs. Frequently cattle mire down in the streams of that region and Harmon has saved the lives of a number with his high-powered car.

Columbus Says Universal Lights—The city council of Columbus, O., has adopted an ordinance to compel every vehicle that traverses the streets of the city after nightfall to carry a light. Only one kind of vehicle is excepted and that is a baby carriage. The ordinance becomes effective within 60 days of its passage.

Favors T. C. A. Regulations—The Louisiana Motor Club has memorialized the state legislature advocating the adoption of uniform laws regulating motor cars. It is asked that the regulations drawn by the Touring Club of America, already adopted by a number of states, be embodied in the statutes of the state.

Duluth Starts After Roads—The Duluth Automobile Club has started a roads campaign. It is laying out a new Twin City Duluth road, which is to reach from Sandstone, Minn., the half way point, through Superior, instead of direct to Duluth. The club has seventy-five members and plans to double the list before November 1. The Minnesota State Automobile Association has reached the 3,000 mark and is growing. The additional membership in the Duluth club will be the first increase for the fall.

Hoosiers Pick Directors—Directors of the Hoosier Motor Club, Indianapolis, were elected on October 1 and within a few days will elect officers for the ensuing year. There was a lively pre-election campaign between the progressive and regular tickets, the progressives electing seven out of nine directors. The new directors are: One year, C. F. Zwick, Fred E. Wilson and J. M. Ward, Jr.; 2 years, William Esterly, Dr. A. C. Kimberlin and Joseph Raub; and 3 years, J. L. Gavin, George A. Weidley and Fred I. Willis.

Race with Bull Moose—Miss Rose Smith, of Amherst, N. S., is able to tell of an exciting race between her father's car and a big bull moose a few evenings ago. The car was on the way to Halifax and was near Bass river when the moose was approached leisurely trotting along the highway. As soon as the moose saw the motor car he flung back his great spread of antlers and, giving a loud snort of defiance, sprang into the race straight along the road. Although the moose was running fast, the car steadily gained upon him, and for over 4 miles the race was kept up. Finally, the moose jumped to one side of the highway and in doing so gave a farewell by kicking the glass out of one lamp and bending the mud guard.

Ohio Road Progress—The Ohio state highway commission has made a report showing the progress made in the improvement of the highways of the state up to date. During the year road construction has been accomplished to the extent of $1,122,060.97. The total length is 658,046.4 lineal feet. There were five kinds of construction used, viz.: brick, concrete, bituminous macadam, water-bound macadam and gravel. The state paid half of the cost of construction on these roads.

Motorphobia Apparent—With the extension of good roads into rural districts of Louisiana where motor cars never have been seen before there is some opposition to them being manifested by the ignorant classes. Obstructions have been placed on the roads and glass scattered. This is particularly true of the Marion road in Union parish. This road is in splendid condition and there has been much motoring over it since it was completed. The loss of a few chickens and a dog is said to have been the cause for the hostility of the natives to motor cars.

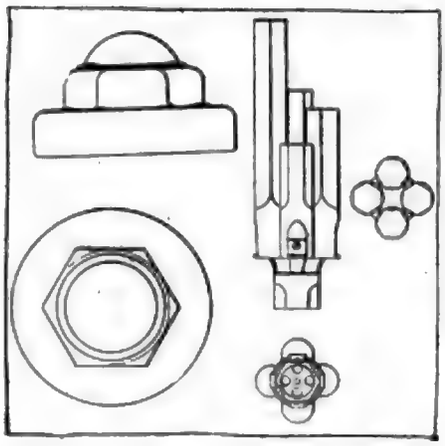
Makes It Easier for Cops—In the French quarter in New Orleans, laid out nearly 200 years ago, there has been great difficulty in handling the traffic, owing to the narrowness of the streets. In the last report of the chief of police, he states that, due to the increased number of motor vehicles, it is now possible to reduce the traffic squad materially in the old part of the city. When horses were used altogether, the lives of pedestrians often were endangered by the animals becoming unruly in the jam at street intersections. Motor vehicles have so changed conditions that less than half the number of policemen formerly used on the traffic squad in this section now are employed.

As the Railroads See It—Reference to the motor cars and the way it cuts into the earnings of railways is contained in the statement by President Howard Elliott of St. Paul, president of the Northern Pacific Railway Co., in the company's annual report issued last week. Says Mr. Elliott: "There is little doubt also but that the growing use of the motor car has had its effect on the volume of the passenger business. The latest figures for registration of motor cars shows that there are, not counting commercial vehicles, 827,824 in the United States, or about one for every 115 people, and in the states served by your company, one motor car for about every ninety people. This results in considerable decrease in the short travel on the railroad, and also has had the effect of reducing the volume of pleasure travel, temporarily at least, because people of moderate means cannot own cars and also make trips to the mountains, parks and lakes. The same causes that affected passenger earnings caused reductions in express and other sources of revenue classified in the income account under 'Other revenue from transportation' and 'Outside operation.'"

Car Stretches Wire—Elmer Sherman, district superintendent of construction of the Coast Counties Gas and Electric Co., found a new way of using his Regal car, in the capacity of wire-stretcher. The wire was fastened to the rear axle of his car and the work was accomplished in 2 hours, that would have taken 2 days to finish by any other means.

Real Estate Men Complain—Real estate men in Montgomery, Ala., are blaming the motor cars for the alarming decrease in the sales of city property. They say that young men who a few years ago invested their surplus money in properties now are buying cars. The homestead companies are suffering severely for this reason, it is claimed. It also is claimed that men of means who formerly made many investments in real estate now are spending all their spare time touring and there no longer is any inclination to spend the time it takes to keep familiar with the local real estate market.

Curious Situation in the East—The next session of the Maine legislature will be called upon to act upon two motor problems that represent the two extremes, and it will be interesting to watch the outcome. Some of the residents of Bar Harbor, having become tired of the loss of business due to the absence of tourists who are not allowed to motor on the island, plan to put in a petition to revoke the law passed especially to exclude motor cars from that place. On the other hand some of the inhabitants of Dark Harbor and Islesboro, another island on the coast within a few miles of Bar Harbor, have instructed their selectmen to get busy and put in a petition for a special law that will give them the privilege of excluding motor cars from their domains as a result of a few motors trespassing upon their little kingdom. At both places there are many summer homes owned by wealthy residents from other states, many of whom own cars, and some of them would like to use their machines at their homes there. Another curious situation exists at Nantucket, a little island off the Massachusetts coast which is protected from motor invasion by a specially enacted state law from motor cars being used there. The selectmen have purchased a motor fire engine and some of the residents favoring motor cars have threatened to have the law enforced if the firemen use the machine, for there is no exemption in the statute for any kind of a vehicle. Meanwhile the fire wagon must remain idle until the legislature meets next year and passes an exemption clause unless the firemen take a chance and rely upon the judge of the court to give them immunity.



THOMAS HUB-CUP DESIGN AND AERMORE HORN

Current Motor Patents

COMBINED Flywheel and Planetary Gearset—To Charles M. Leech, Lima, O. Filed August 25, 1911, dated October 1, 1912. Condensed into proportions little greater than the usual flywheel and clutch unit, this changgear and flywheel consists of a planetary gearset, the friction members of which are in the form of clutches instead of the usual band brakes. The assembly consists of a driving cup and a main clutch cone, adapted to engage therewith, the driving cone being internally toothed on its greatest inside diameter, these teeth meshing with the teeth of a planetary gear train, comprising a set of gear pinions secured on stub shafts to a revolving casing, and having a corresponding train of long pinions of smaller diameter than themselves secured integral to them.

Those long pinions engage a toothed portion of the main clutch cone. This member is integral with the driven shaft, which is slidably mounted at its forward end in the hub of the driving cup. Meshing with the large diameter or primary gear train, on its interior portion is a gear pinion, the toothed portion of which is secured to its hub through a ratchet. An extension of the hub is formed into a bevel cup, adapted to receive a corresponding clutch cone. This cone is keyed or splined to a stationary bearing, in which the driven shaft turns. Integral with it is a disk clutch member adapted to engage a faced disk clutch member which forms the rear portion of the revolving case, upon which the annular gears are mounted. The clutch members are fitted with springs to hold them in engagement and collars and yokes for control.

Engagement of the main clutch gives direct drive. Engagement of the secondary cone clutch locks the internal spur gear, and the planetary pinions and their cage travels at a reduction, with the driving cup, turning the main clutch cone at a still greater reduction in the same direction. Engagement of the clutch disk at the rear, locks the casing, and the main clutch cone is driven at a reduction in the reverse direction from that of the rotation of the driving cup. The device is dynamically feasible, although some critics doubt whether, if kept dry enough for the proper adhesion of the clutches, the gears would receive sufficient lubrication.

Apple Magnetic Generator Clutch—No. 1,039,685—To Vincent G. Apple, Dayton, O. Filed December 26, 1911, dated October 1, 1912. In connection with a lighting and charging generator, for the purpose of automatically connecting and disconnecting it with the driving means, this clutch consists of two concentric clutch rings, the first secured to the driving means, and the second to the driven armature shaft. These two members are provided with means to produce a magnetic field, appropriate to produce a magnetic drag upon a series of rolling wedges, interposed between the two rings and normally held out of contact with them by springs, but engaging them one to the other in response to the strength of the magnetic flux induced by the relative speed of the driving member. The effect is so adjusted that this moment occurs just as the driving means has attained sufficient speed to cause the dynamo to generate sufficient current to overcome the resistance of the storage battery, and to disengage when the speed falls below this limit of safety.

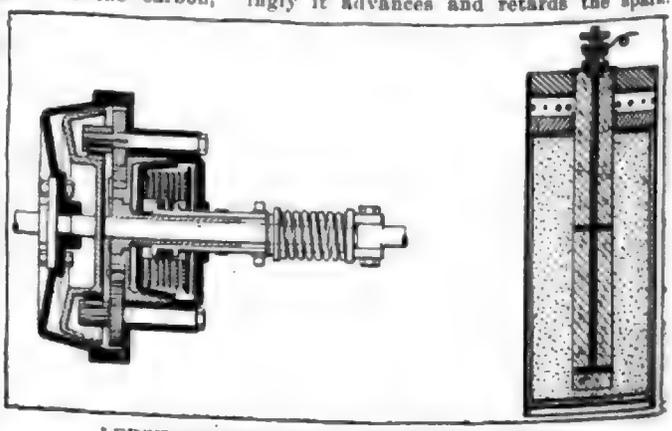
Primary Dry Cell—No. 1,039,949—To Carl and Bertha Jaeger, Los Angeles, Cal. Filed March 6, 1912, dated October 1, 1912. Similar to the usual form of american dry cell, this design differs in that the carbon element is provided with longitudinal passageways, intersected by lateral passageways, which open at the surface of the carbon electrode. The whole is contained in a zinc can and sealed in the usual manner. At the top of the whole, directly under the sealing layer is a chamber which communicates with the passages in the carbon element. The effect of this construction is to increase the area of contact of the electrolyte and the carbon, producing greater amperage, although at the expense of life.

Pneumatic-Cushioned Wheel—No. 1,040,114—To Irwin H. Babcock, De Ruyter, N. Y., assignor of one-half to Lyman H. Coon, De Ruyter, N. Y. Filed September 21, 1911, dated October 1, 1912. This invention seems to overcome the chief objections that have been raised against pneumatic hubs and mechanical tires. This wheel, while the pneumatic element surrounds the hub, is not of the floating hub type, as it is encased between rigid steel side-plates. The tire is mechanical, but is not rigid, absorbing road obstructions instead of bouncing over them. The tire of the wheel is a pliable strip of tread material, held in place by a set of plungers, one for each spoke, which reciprocate within the hollow spokes of the wheel, bearing at their inner ends upon the pneumatic cushion. The action is therefore similar to a pneumatic tire, except that the impressions are transmitted from the tread to the air envelope through the plungers instead of direct, and the air volume is not so great.

Motor Car Body and Seats—No. 1,039,780—To Franklyn J. Morgan, Chicago. Filed June 26, 1911, dated October 1, 1912. This body is of the three-abreast roadster type, but differs from the usual designs of this type in that the center seat is farther back than the other two, thus permitting the outside seats to be closer together than where the seats are truly abreast.

Design of Aermore Horn—No. 43,081—To Gulian V. P. Lansing, Chicago, Ill., assignor to Aermore Mfg. Co., Chicago. Filed July 29, 1912, dated October 1, 1912. This design was occasioned by the fact that horns of this make are usually applied to the rear of the motor car, in a more or less conspicuous position, and is for the purpose of making them more ornamental than when the pipes are round. In this design they are of hexagonal shape.

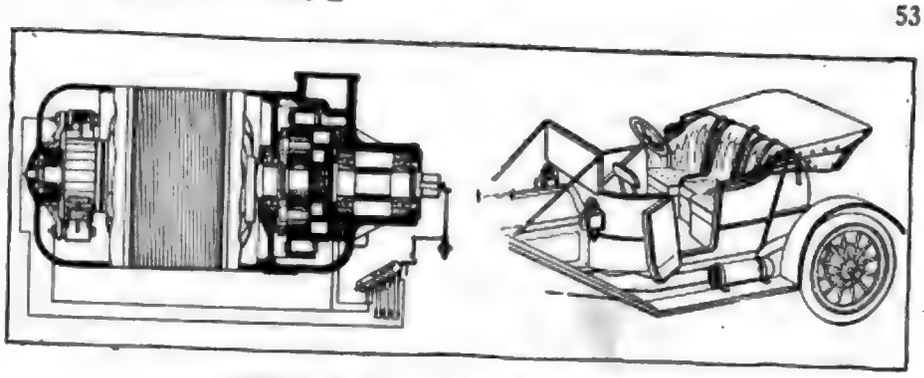
Automatic Speed Control for Motor Vehicles—No. 1, 040,189—To Henry F. Grubb. Lorain, O. Filed August 8, 1910, dated October 3, 1912. To automatically control the spark and throttle of an internal combustion motor car engine, this device consists of a revolving-ball governor, which is controlled from the steering wheel, to open or close the throttle below or above, respectively, a certain speed. Correspondingly it advances and retards the spark.



LEECH GEARSET AND JAEGER DRY BATTERY

As additional control for the purpose of reversing the action of the governor on the spark mechanism in reference to its action on the throttle is provided.

Design for Hub Caps—No. 43,085—To John L. Sugden, Buffalo, N. Y., assignor to E. R. Thomas Motor Car Co., Buffalo, N. Y. Filed August 18, 1911, dated October 1, 1912. The hexagonal faces of this hub cap are for the purpose of giving a wrench a purchase for removal, and are more ornamental than where their use is disguised beneath meaningless and dust-catching decoration.



APPLE DRIVE CLUTCH AND MORGAN BODY

The Motorists' Bookman

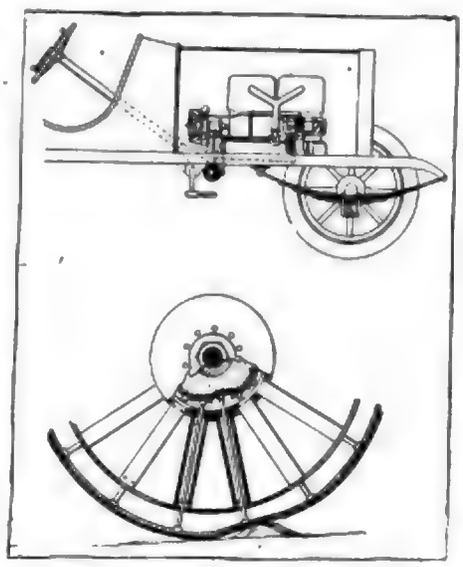
Power and the Plow

A NEW order of things is coming into being in the matter of farm powers Horses have been bred and developed to their utmost, but the farmer is still dissatisfied. Horse-feed is scarce and dear, and farm help more so. Out in Jim Hill's great northwest, farming under modern methods, is being conducted on such a stupendous scale that the finest products of the horse-breeders' art are relegated to the discard in as far as the bulk of the tilling of the toil and harvesting of its products on the great farms of the northwest is concerned.

Farmers demand more efficient machinery. This because farm help is scarce and becoming scarcer. To enable farmers to do their work short-handed, manufacturers of farm appliances have developed plows which cut more furrows at a passage, mowers that cut a wider swath, harvesters that bind more grain per day, and machinery that can cut, pick, and husk the golden harvest of corn at one operation. This enables one man to do the work of many, and in less time; furthermore increases the demands upon the man, raising in consequence the quality of farm labor, enabling the farmer to offer better wages as inducements to employes. But all of this increased the demands upon the horse, to such an extent that the manufacturers were forced to temporarily call a halt on the development of these devices. The size of the improved implements of farm efficiency, had to be limited to the capabilities of the horse, which limit was below the capacity made requisite by the conditions of the farm labor market. Increased land values also contributed their silent protest against the inefficiency of the faithful draught-animal. The power tractor is therefore coming into recognition as the only solution of this difficulty.

L. W. Ellis and Edward A. Rumley, authorities not only on agricultural machinery and tractors, but on scientific agriculture as well, have discussed this great question in a very complete and interesting volume, "Power and the Plow," published by Doubleday, Page & Co., New York. Commencing with an account of the annual Winnipeg plowing contest as an introduction to the field, a real surprise is in store for most readers in the advances already made. The history of the plow and its problems is next discussed, from the first crooked stick to the modern steam and gasoline gang-plow. The measurement of power is next discussed, animal and mechanical power are compared, each type being thoroughly analysed, and the history of power plowing. The different types of gasoline and steam tractors are next discussed, and their uses distinguished, and ways and means of utilizing them to the best advantage are treated.

The book reads like a romance, and in turning the last page one is made to feel that it is indeed a romance that has been enacted in the mechanical development of the natural resources of the great northwest. Also that what can be done on a large scale with crude instruments, will eventually be done on a more moderate one with machines of later development. Excellent illustrations, charts, diagrams, and an appendix containing a list of specifications of the leading makes of gas tractors, and a list of eminent authorities, append the work, and the book is concluded with an inspiring prophecy on the future of the gasoline tractor.



GRUBB CONTROLLER AND RUYTER WHEEL

Pyrometry

Pyrometry, or the measurement of degrees of temperature beyond the boiling point of mercury, is a science that has been very highly developed in recent years, and which has found a wide field in the industries as well as in scientific research, but so much has been done toward its evolution that little attention has been given to the chronicling of the achievements in this field. Charles R. Darling, who is an authority on heat in Great Britain, has undertaken this work supplementary to his former work, "Heat for Engineers."

"Pyrometry" is a treatise on the practical use and application of pyrometers, and is published by Spon & Chamberlain, New York. The discussion is opened with a general exposition of the science, its application, history and the instruments used in it, of which there are no fewer than sixteen forms, with many variations of each form. The measurement of high temperature is a problem involving many difficulties, as there are many temperatures to be measured that exceed the melting point of gold and platinum, and the internal pressures in closed vessels resultant therefrom being greater than the strength of porcelain and glass. Thus the forms wherein closed vessels are used, or where the expansion of solids is relied upon as the registering element, are limited in their scope.

The development of the science of pyrometry was retarded by these apparently insurmountable obstacles, until the thermal properties of electricity were discovered and applied. In the experiments along this line, many wide fields of application for pyrometric apparatus were uncovered, notably in the steel industry, until at the present time, young as this science is, it is one of the most advanced, and has a wide field of uses. The subject is gone into deeply, and yet is treated with a breadth of scope that makes the work comprehensive, intelligible, and interesting. The book contains 196 pages, well illustrated with drawings, tables and diagrams, and sells for $2 net, in cloth, 5 by 7½ inches.

Brief Business Announcements

ALTAMONT, N. Y.—William Whipple has opened a garage in the building used formerly as livery by Homer Frink.

Ticonderago, N. Y.—The Ticonderoga Pulp and Paper Co. is building an immense garage in Main street.

Port Chester, N. Y.—Clifford Flint has purchased interests of John W. Hubbard in the City garage, but Arthur B. Lowden will remain in firm as partner.

Boston, Mass.—Louis Sackett, who recently resigned from the Boston branch of the Oakland, has accepted a position with sales force of the Boston Stutz agency.

Winnipeg, Man.—The local Ford Agency has removed to its new premises, 81-85 Walter street. Its old offices will be occupied in the near future by the Cadillac Motor Sales Co.

Detroit, Mich.—The Federal Motor Truck Co. has added to its staff of executives Garvin Denby. He has been appointed secretary and treasurer with general charge over the sales department.

Phoenix, Ariz.—Arizona has been added to the territory handled from the Los Angeles agency of the Hudson Motor Car Co. A sub-agency has been established in Phoenix. The Hudson formerly was handled locally by W. D. Tremaine.

Kenosha, Wis.—F. D. Oley, chief draftsman for the American Brass Co., of Kenosha, Wis., has resigned to engage in the garage and repair business. Mr. Oley has purchased the business of Thomas B. Whitaker, West Main street, Kenosha.

LaCrosse, Wis.—The Parker-Hirt Co has been organized to deal in motor cars and accessories. The company has been incorporated with an authorized capital of $5,000 and E. W. Parker, Joseph F. Hirt and Harriet E. Parker are the incorporators.

New York—William J. Lasher has severed his connection as branch manager of the Carl H. Paige Co., handling the Chalmers, to join forces with the Abbott Detroit. Mr. Lasher in his new capacity will have charge of the agency business of the Abbott-Detroit Co.

Minneapolis, Minn.—The Bowman & Libby Overland building, one block nearer the center of the city, Twelfth street and Hennepin avenue, has reached the first floor. This is to be 66 by 150 feet, four stories and fireproof. The Goodyear Tire and Rubber Co., will be a tenant. The Colby Motor Co. is erecting a building at Sixteenth street and Hennepin avenue, 50 by 150 feet, to cost $30,000. H. E. Pence, of the Pence Automobile Co., will erect a large building covering one-quarter of a block, at Tenth street and Hennepin avenue, for the Buick and Stearns-Knight cars.

Auburn, N. Y.—Edward A. Ross has opened a thoroughly equipped garage at 20 Water street.

Detroit, Mich.—Harry A. Windsor has been appointed Detroit representative for the Fulton-McCutchan Co., of Chicago, with offices in the Majestic building.

Detroit, Mich.—Guy Vaughan, former engineer for Wyckoff, Church & Partridge, of New York, has joined the engineering staff of the Olds Motor Works, of Lansing.

Antigo, Wis.—G. A. Zwickey and F. J. Zwickey have leased the garage and repair shops at 625 Superior street, recently closed, and have reopened under the style of Service Motor Co.

Albany, N. Y.—Albert Whitney has retired from partnership of the firm of Bishop & Whitney, who conduct a car salesroom here at 224 Baldwin street, but the business will be continued by J. Bruce Bishop.

Detroit, Mich.—Theodore C. Reid of Chicago has joined the sales force of the Grinnell Electric Car Co. and will succeed Homer W. Potter in the local field, Mr. Potter having become traveling representative in the northern territory.

Reedsburg, Wis.—Sorge & Foss have broken ground for a new garage building on Park street. The company is composed of Albert Sorge and Frank Ross, who have secured the agencies for the Rambler and Overland in this territory.

Portland, Me.—George L. Stuart, one of the first motor dealers in Portland, Me., who handled the Cadillac here until recently when he sold out his interest in the agency, has decided to move to Los Angeles, where he will go into business shortly.

Minneapolis, Minn.—The Northwestern Cole Motor Co., 219 Sixth street S., has been formed to handle the northwest distributing business of the Cole Motor Car Co., of Indianapolis. It will occupy the quarters of the Haynes-Knutson company, former distributor. H. P. Wood is president and general manager.

New York—The Stoddard Motor Co., distributor of Stoddard-Dayton cars in the metropolitan territory, has moved from Fifty-seventh street to the building of the United States Motor Co., at Broadway and Sixty-first street. This move is a part of the general plan of concentrating facilities for the sale of products of the United States Motor Co. The show room will be located on the ground floor on the Sixty-first street side of the building, while the entire second floor, running through to Sixty-second street, will be devoted to service requirements.

Hudson, N. Y.—Hester Brothers have purchased the Malley garage but will continue business under the name of the Warren street garage.

Racine, Wis.—The Mitchell Motor Co., of Seattle, Wash., a Racine corporation subsidiary to the Mitchell-Lewis Motor Co., of Racine, has filed articles of dissolution

Detroit, Mich.—A. W. Brown, who for many years has been traveling representative of the Herreshoff Motor Car Co. has resigned and will enter the motor truck field.

St. Paul, Minn.—The Cooperative Auto Co. is a new concern headed by S. W. Wicks, formerly sales manager for the White Bear Auto Co. The garage is at 199 West Fifth street.

Boston, Mass.—Edward L. Vail, for several years manager of the Boston branch of the Splitdorf Magneto Co., has resigned to accept a position as sales manager and traveling representative for the Hoffecker speedometer.

Lydonville, Vt.—William C. Garry, dealer in motor accessories, has filed a petition in bankruptcy in the United States court giving his liabilities as $2,585.93 and his assets as $1,097 of which $400 is claimed to be exempt.

Rochester, N. Y.—Thomas J. Northway, local Ford distributor, has completed plans for the construction of a three-story, steam-heated salesroom to cost $12,000 The building will be erected as an addition to the present garage in Exchange street.

Minneapolis, Minn.—George B. Levy and Louis Andersch, as the Andersch Brothers Motor Car Co., who have taken on the Abbott-Detroit line for the northwest, have bought property at Harmon place and spruce place, where they will erect a four-story building for their business.

Phoenix, Ariz.—The Arizona Motor Co., Inc., has been absorbed by the Transcontinental Motor Co. F. A. Carr, manager of the former concern, is now with the Transcontinental. By this deal the Transcontinental company secures the local agency for the Krit car.

Detroit, Mich.—What is claimed to be the largest truck service station in the United States has just been opened in this city by the General Motors Truck Co The building, which has space to take care of from 150 to 200 trucks, fronts on Fort and Twelfth streets and Lafayette boulevard, and was erected at a cost of about $150,000. There is a total floor space of 50,000 square feet, which is utilized for garage, repair shops, stock room,

as well as for offices and for a smoking room for the convenience of patrons.

Los Angeles, Cal.—Ralph Hamlin, Franklin dealer here, has just broken ground for a new salesroom and repair shop.

Milwaukee, Wis.—Wagner & Johnson, of Racine, Wis., recently appointed state agents for the Regal, have established their principal headquarters at 370-374 Grove street, Milwaukee.

St. Louis, Mo.—F. S. Cropley, for several years connected with the G & J tire, has taken over the old Federal tire agency in St. Louis and has established a factory branch there. This factory branch will be the distributing point for the southwestern states.

Baltimore, Md.—The Philadelphia Motor Tire Co. has opened up an agency at 107 West Mt. Royal avenue.

Windsor, Ont.—Frank Miermicke has opened a garage in the Ferris building, and later will secure several agencies for cars and conduct a livery business.

Philadelphia, Pa.—The Lansden-Webb Co. of Philadelphia has been incorporated at Harrisburg with a capital of $50,000. The local home of the company, which handles the Lansden electric trucks and Webb fire apparatus, is at 616-618 North Broad street, in charge of Edward R. Griel.

Toronto, Ont.—The Bulldog Tire Co., Ltd., has been incorporated with a capitalization of $300,000.

St. Louis, Mo.—The Warren Automobile Co., local agent for the Warren line in St. Louis is erecting a new building on Locust street. It will be used as a show and salesroom.

Louisville, Ky.—The McPherson Automobile Co., with an authorized capital stock of $1,000, has filed articles of incorporation in the county clerk's office. The incorporators are: Franklin McPhor-

Recent Agencies Appointed by Car and Truck Manufacturers

PLEASURE CARS

Town	Agent	Car
Armington, Ill.	R. L. Kampf	Cole
Aurora, Ill.	C. C. Hinckley	Cole
Bath, Me.	Harry Washburn	Cole
Birmingham, Mich.	George C. Hupp	R. C. H.
Binghamton, N. Y.	D. V. Ashley	R. C. H.
Bloomington, Ill.	D. W. Walters	Palmer-Singer
Bloomsburg, Pa.	C. W. McKelvey	Cole
Boston, Mass.	F. E. Proctor	Palmer-Singer
Brockton, Mass.	Loring Motor Car Co.	Krit
Bryan, Tex.	Dr. P. M. Raysor	Palmer-Singer
Buffalo, N. Y.	R. H. Pattison	R. C. H.
Center, Tex.	Howard C. Parker	Overland
Champaign, Ill.	J. L. Wiese & Son	R. C. H.
Chicago	John Hemwall Auto Co.	Cole
Chillicothe, Mo.	H. L. Gilbert	Cole
Columbus, O.	Columbus Auto Inn	R. C. H.
Crescent City, Ill.	Crescent Garage & Supply Co.	Reo
Columbus, O.	D. W. Short	R. C. H.
Columbus, O.	Edward Miller	Metz
Columbus, O.	F. E. Avery	Premier
Columbus, O.	G. E. Thomas Co.	Packard
Columbus, O.	High-Seventh Garage	Studebaker
Columbus, O.	Sitgreaves & Boyd	Michigan
Columbus, O.	Snyder Automobile Co.	R. C. H.
Dallas, Tex.	Tife & Miller	Abbott-Detroit
Decatur, Ill.	Frank L. Winters	Regal
DeKalb, Ill.	G. H. Dean & Co.	Cole
Denver, Colo.	W. W. Barnett	Cole
Danville, Ill.	I. B. Chambers & Son	Palmer-Singer
Richmond, Va.	Charles W. Shields & Co.	Cole
Frankfort, Ind.	Model Machine Works	Palmer-Singer
Fall River, Mass.	F. W. Davis & Sons	Cole
Flora, Ind.	Greider & Hawkins	Cole
Ft. Wayne, Ind.	Ft. Wayne Iron Store Co.	R. C. H.
Gadsden, Ala.	K-E Auto & Electric Co.	Cole
Gladstone, Mich.	Charles Slining	Oakland
Hartford City, Ind.	Kathryn P. Carroll	Palmer-Singer
Holyoke, Colo.	George W. Garland	R. C. H.
Houston, Tex.	Peters Brothers	R. C. H.
Iowa City, Ia.	H. A. Knease & Sons	Palmer-Singer
Jennings, La.	J. E. Parsons	Cole
Kankakee, Ill.	Fleming & Brown	Buick
Kewanee, Ill.	Kewanee Garage	Cole
Kossuth, Pa.	G. E. Kelly	Cole
Lancaster, O.	Mattox Motor Car Co.	R. C. H.
Lancaster, O.	Mattox Motor Car Co.	Empire
La Crosse, Wis.	Elsen & Phillips	Mitchell
Lockport, N. Y.	Niagara Garage	Cole
London Mills, Ill.	Zenette Groom	Ford
Marion, Ia.	J. L. Ingram	Palmer-Singer
Meadville, Pa.	Thomas & Klebort	Palmer-Singer
Middletown, N. Y.	Hotel Brown Garage Co.	Cole
Minneapolis, Minn.	John P. Snyder Automobile Co.	Stevens-Duryea
Momence, Ill.	W. J. Riley	Cole
Montgomery, Ala.	Cole-Montgomery Motor Co.	Cole
Montreal, Can.	E. Major	Palmer-Singer
Montreal, Que.	Royal Automobile Co.	Cole
Mt. Carmel, Ill.	Baumgart & Co.	Palmer-Singer
Mt. Bullion, Cal.	J. J. Youd	R. C. H.
Mulberry, Ind.	Burkhalter Brothers	R. C. H.
Muncie, Ind.	Muncie Garage	R. C. H.
Needham, Ind.	L. M. Megee	Cole
Newark, N. J.	Henry Heinsheimer	Palmer-Singer
New Haven, Conn.	Ray L. Bishop Motors Co.	Marion
New Orleans, La.	Myatt-Dicks Motor Car Co.	Franklin
Olney, Ill.	B. E. Brading & J. M. Swick	Cole
Peoria, Ill.	C. W. Robison & Co.	Cole
Peshtigo, Wis.	Eugene St. Peter	Buick
Philadelphia, Pa.	Liberty Motor Co.	Palmer-Singer
Portage, Wis.	A. R. Slinger	Cole
Portland, Ore.	Becker Automobile Co.	R. C. H.
Providence, R. I.	Pugh Brothers	Palmer-Singer
Pueblo, Colo.	Ideal Motor Car Co.	Palmer-Singer
Ravenna, O.	Dale Dietrich	Cole
Reedsburg, Wis.	Sorge & Foss	Overland
Reedsburg, Wis.	Sorge & Foss	Rambler
San Antonio, Tex.	C. H. Dean	Hupp-Yeats
Sandusky, O.	Welby C. Waterfield	Cole
San Francisco, Cal.	A. D. Perkins	Perfex
Santa Rosa, Cal.	E. M. Dates	R. C. H.
Schenectady, N. Y.	W. E. Berning	Palmer-Singer
Sioux City, Ia.	Cole Motor Co.	Cole
Spokane, Wash.	L. W. Gilmore	R. C. H.
Spokane, Wash.	Spokane Taxicab Co.	Detroiter
Springfield, Ill.	Van Duyn & Mathias	Cole
Springfield, Mass.	Blue Ribbon Garage	Palmer-Singer
St. Louis, Mo.	Lindsay Motor Car Co.	Flat
St. Louis, Mo.	Meyer-Busch Automobile Co.	Speedwell
St. Louis, Mo.	N. W. Bond Automobile Co.	Glide
St. Paul, Minn.	Smith & Heberle	Little
Syracuse, N. Y.	J. T. Mollard	Palmer-Singer
Toronto, Can.	C. A. Finzel	Rambler
Trenton, N. J.	H. E. Stout & Son	Palmer-Singer
Wabash, Ind.	C. M. Story	R. C. H.
Walla Walla, Wash.	J. M. Moor	Overland
Washington, D. C.	Warrington Motor Co.	Palmer-Singer
Wilmington, Del.	Wilmington Michigan Motor Car Co.	Michigan
Wilmington, N. C.	Queen City Cycle Co.	Palmer-Singer
Winnipeg, Can.	Lion's Auto Garage	Marmon
Worcester, Mass.	Harvey Parker	Palmer-Singer

TRUCKS

Town	Agent	Car
Adrian, Mich.	J. Beckenbaugh	Modern
Albany, Ore.	Barrett Brothers	Federal
Anaheim, Cal.	J. J. Weisel & Co.	Federal
Austin, Tex.	Ben M. Barker	Federal
Bakersfield, Cal.	Ben L. Brundage	Federal
Columbus, O.	Avery Truck Co.	Avery
Connellsville, Pa.	Connellsville Garage	Federal
Dallas, Tex.	W. T. Fulton Co.	Wichita
Dallas, Tex.	Alamo Automobile Co.	Federal
Eugene, Ore.	J. S. Airheart	Federal
Fresno, Cal.	C. W. Hobson Co.	Federal
Ft. Wayne, Ind.	Drage-Harris Motor Truck Sales Co.	Modern
Fitchburg, Pa.	Fitchburg Hardware Co.	Federal
Fall River, Mass.	Robert W. Powers	Federal
Hollywood, Cal.	J. E. Carroll	Federal
Hamburg, N. Y.	D. W. Brodbeck	Federal
Houston, Tex.	Alamo Automobile Co.	Federal
Imperial, Cal.	Edgar Brothers	Federal
Long Beach, Cal.	McKenzie & Bellows	Federal
Los Banos, Cal.	W. M. Roberts	Federal
Lawrence, Mass.	Smith Brothers	Federal
Missoula, Mont.	J. J. Deakin	Modern
Marion, O.	C. R. Merchant	Modern
Nashville, Tenn.	Charles W. Caillouette	Modern
New Orleans, La.	Joseph Schwartz Co., Ltd.	Adams
Pomona, Cal.	Whip & Zander	Federal
Pendleton, Ore.	M. K. Long	Federal
Pasadena, Cal.	Munroe Motor Co.	Federal
Reno, Nev.	J. R. Wainwright	Federal
Santa Anna, Cal.	T. W. Neely	Federal
Salem, Ore.	W. J. Pruitt	Federal
Sydney, Australia	H. Halburn Potts	Modern
St. Louis, Mo.	Standard Automobile Co.	Commerce
Stockton, Cal.	Sampson Iron Works	Federal
Salt Lake City, Utah	Cheeseman Auto Co.	Federal
San Diego, Cal.	Hunt Auto Co.	Federal
Springfield, Mass.	W. H. Baxter	Federal
St. Paul, Minn.	Pence Automobile Co.	Federal
Tillamook, Ore.	A. H. Harris	Federal
Taunton, Mass.	Brownell & Burt	Federal
Tacoma, Wash.	Pacific Car Co.	Federal
Toronto, Can.	Canadian General Electric Co.	Knox
Toronto, Can.	Central Garage Co.	Abbott-Detroit
Ventura, Cal.	R. O. Dennison	Federal
Victoria, Tex.	Texas Motor Car & Supply Co.	Federal
Whittier, Cal.	Saunders Brothers	Federal
Washington, D. C.	Peerless Motor Transfer Co.	Modern
Winston-Salem, N. C.	Motor Co.	Modern
Worcester, Mass.	Power Truck Sales Co.	Adams
Watsonville, Cal.	H. G. Brewington Co.	Federal
Waco, Tex.	Percy Willis	Federal

son, Catherine McPherson and Olive McPherson. The new concern will engage in the repair business.

Guelph, Ont.—With a capital of $40,000, the Sterling Rubber Co., Ltd., has commenced business here.

Sherbrooke, Que.—The Canada Tire Filler Co., Ltd., with a capital stock of $150,000, has been incorporated with headquarters here.

Binghamton, N. Y.—William G. Faatz has purchased the interests in Brown's garage of Howard Brown. He will continue to conduct a general sales business.

Philadelphia, Pa.—A direct factory branch of the Federal Rubber Mfg. Co., of Milwaukee, has been established at 707 North Broad street, in charge of Harry D. Benner.

Buffalo, N. Y.—The Willys-Overland Motor Co., Toledo, O., is planning to construct a three-story salesroom and garage at 1075 Main street, land having been purchased for $39,000.

Atlanta, Ga.—The Atlanta Taxicab Co. has surrendered its charter. It has been in the hands of a receiver, Elliott E. Cheatham, for some time. Judge George Bell has just named Mr. Cheatham permanent receiver.

Racine, Wis.—The Wallis Tractor Co. has been organized by H. M. Wallis to engage in the manufacture of a line of farm tractors. The company is incorporated with a capital stock of $300,000 and in addition to Mr. Wallis, W. C. Quarles, of Milwaukee, and Markley Wells, of Racine, are associated in the company.

Indianapolis, Ind.—A number of changes are reported in the trade in Indianapolis and vicinity. Joe Kelly, formerly sporting editor of the Indianapolis Sun, has become advertising manager for the Cadillac Automobile Co. of Indiana. F. O. Lane has become factory manager of the Gates Mfg. Co. of Indianapolis. H. M. Freeman, treasurer and manager of the Finch & Freeman Auto Co., has become general sales manager of the Clark Motor Car Co., Shelbyville. H. W. Martz has been appointed a salesman for the A and M Sales and Service Co. of Indianapolis.

Cohoes, N. Y.—William D. Bowles has been appointed manager of a new garage of the Congress Garage Co., on Lancaster street.

Brooklyn, N. Y.—Isaac Kirkman has purchased a three-story brick building at 33 Grant avenue and will remodel it into a garage and salesroom.

Lexington Co.—The Kentucky Automobile Co. of Louisville will establish a branch at Lexington. Work on the new structure in that city has already been started.

New Orleans, La.—A factory branch of the Oakland Motor Co. has been opened here. W. C. Cray is in charge of the new place, which has secured quarters at 745 Baronne street.

Baltimore, Md.—The Ford Auto Co., of Baltimore, is looking around for about 3,000 feet of additional floor space. The firm finds the present plant at 122 West North avenue inadequate.

Detroit, Mich.—The Century Electric Motor Car Co. has removed its factory to the new building erected by the company at Woodward and Lathrop avenues and has started work with two shifts, night and day.

Menominee, Mich.—The D. F. Peyer Co., manufacturing the Menominee truck, Menominee, Wis., has been organized with $75,000 capital. The new company takes over the interests of W. S. Carpenter. The officers are: President, D. F. Peyer; vice-president, F. J. Trudell; secretary-treasuer, Harry S. Emerson.

New Orleans, La.—Enlarging business has made it necessary for the Hudson agency to occupy more spacious quarters. A completely equipped repair shop has been installed in connection with the new sales rooms at Baronne and Perdido streets. C. M. Hanson, agent for the Cleveland car, has opened improved sales rooms at St. Charles and Julia streets. The Day Automobile Co., handling the local agency for the Paige-Detroit and the Alco companies has moved into new quarters on Rampart street.

Poughkeepsie, N. Y.—William Bonner has completed plans for the construction of a fireproof garage on the site of the Dusenbury garage.

Andover, Mass.—The Tyer Rubber Co. has its new addition nearly completed and in a couple of weeks the company will be manufacturing tires of all kinds for motor vehicles.

St. Louis, Mo.—The St. Louis Lozier Co., organized to take the agency for the Lozier line in that territory, has opened salesrooms in St. Louis. Nelson S. Gottshall will be in charge.

Boston, Mass.—The Boston agency of the Havers six has moved into new quarters at 121 Massachusetts avenue, recently vacated by the Roberts & Sherburne Co., agent for the American.

San Francisco, Cal.—The Frank O. Benstrom Co. has completed a deal with the Regal Motor Car Co. of Detroit, whereby it hereafter will handle the distribution of the entire Regal line of cars in northern California and Nevada.

Chicago—The Buick Motor Co. has moved its retail salesroom from 1452 Michigan avenue to its main building at Twenty-first and Calumet avenue. The move was made for the purpose of concentrating all of the business at the one point.

Philadelphia, Pa.—A direct factory branch of the Republic Rubber Co., of Youngstown, O., has been opened at 328 North Broad street. The territory of the new branch, which is in charge of J. W. Lyman, comprises eastern Pennsylvania, southern New Jersey, District of Columbia, Maryland and Virginia.

Rochester, N. Y.—G. F. Cox has been appointed local manager of the Fordham company, recently organized with capital of $3,000, for the purpose of manufacturing motor vehicles. The new company has secured for its supply and repair establishment the Hollis-Rand garage on Fordham near Berkeley street. Robert

Recent Incorporations

Atlantic City, N. J.—Holland, Donnelly Co., capital stock, $100,000; general motor car business; incorporators, E. J. Holland, E. R. Donnelly, H. L. Giberson.

Benton, Ill.—Benton Motor Car Co., capital stock, $65,000; to manufacture motor cars and accessories; incorporators, H. Stotlar, W. S. Cantrell, A. H. Fraunfelder.

Buffalo, N. Y.—Corporate Sales Co., capital stock, $5,000; to deal in motor cars and accessories; incorporators, C. J. Wolfe, E. H. Blandy, W. Kobe.

Chicago—Guaranty Auto Co., capital stock, $50,000; incorporators, J. T. Shea, E. Cripsl, C. D. Rattenhoefen.

Chicago—National Radiator Co., capital stock, $30,000; motor car supplies; incorporators, G. W. Platt, E. C. Schmitt, R. L. Dollings, A. M. Draddy, M. F. Platt.

Cleveland, O.—Service Garage Co., capital stock, $10,000; to deal in motor cars and accessories; incorporators, Roy J. Ramson, K. W. Volk, F. Desberg, W. McMahon, J. W. Willids.

Columbus, O.—J. C. Sherwood Rubber Co., capital stock, $20,000; to deal in tires; incorporators, J. C. Sherwood, W. S. Sherwood, R. C. Creppen, P. J. Cull, C. L. Crepen.

Daytona, Fla.—Daytona Auto Supply Co., capital stock, $1,000,000; president, A. G. Hunt; secretary, H. C. Thompson.

Detroit, Mich.—Traveler Motor Car Co.; motor cars and accessories; incorporators, J. P. McIntyre, J. P. Lavinge and others.

Elizabeth, N. Y.—Excelsior Automobile Co., capital stock, $50,000; general motor car business; incorporators, P. H. McGann, C. Raimes, P. Kern.

Johnson, Pa.—United States Motor Sales Co., capital stock, $50,000; incorporators, A. C. Smiler, J. L. Smiler, C. H. Raymond.

Newark, N. J.—McDonough Cogan Motor Car Co., capital stock, $25,000; general motor car business; incorporators, E. Donough, F. T. Cogan, G. T. McDonough.

Newark, N. J.—Ka Dix Newark Motor Truck Co., capital stock, $100,000; commercial and fire fighting trucks; incorporator, G. F. Kallberg.

Newark, N. J.—American Piston Ring Co., capital stock, $25,000; incorporators, A. Wenzel, W. S. Schmidt, B. Wenzel.

New York—T. F. Hahn Co., capital stock, $10,000; incorporator, E. Hahn.

New York—Used Car Co., capital stock, $5,000; deal in motor cars; incorporators, A. F. McNamara, G. Galiani, J. J. Kramer.

Nyack, N. Y.—Nyack Garage, capital stock, $15,000; incorporators, A. Leggett, J. J. Laine, P. J. Duboise.

Phoenix, Ariz.—D. & G. Tire Filler Co., capital stock, $100,000; director, J. U. Garver.

Rochester, N. Y.—Electric Car Sales and Service Co., capital stock, $10,000; to deal in electric motor vehicles; incorporators, M. Bernstein, M. L. Buhrer, G. H. Leaty.

St. Louis, Mo.—Heinrich Automobile Co., capital stock, $2,500; to deal in motor cars; incorporators, V. Heinrich, H. Heinrich, C. Leykam.

White Plains, N. Y.—General Rim Co., capital stock, $150,000; to supply motor vehicles and accessories; incorporators, W. Kaul, R. W. Ashley, F. Oberkirsch

Rand will continue as local agent for the Jackson in the Hollis-Rand garage.

Louisville, Ky.—The Clark Motor Car Co., local agent of the Maxwell and Reo, is erecting a new garage on the south side of Broadway, between Brook and Floyd streets.

Detroit, Mich.—The Lewis Spring and Axle Co., of Jackson, has moved its control department to this city with headquarters in the Boydell building. Fifty men will be empoyed.

Detroit, Mich.—W. E. Kenyon, who recently resigned from the sales force of the Poss Motor Truck Co., has accepted a position as sales representative with the Commerce Motor Truck Co.

Minneapolis, Minn.—The Ford Motor Co. opened its Minneapolis branch and its St. Paul sub-branch October 1. W. C. Anderson, formerly St. Louis Ford branch manager, is in charge. Temporary quarters are in the Great Northern Implement building. Construction of the Minneapolis branch building will begin at once.

Pittsburgh, Pa.—Augustus Hartje, the Pittsburgh paper manufacturer, is having plans prepared for a large motor car storage building to be erected at South Twelfth and Sarah streets. The enterprise will be managed by a company which Mr. Hartje has organized. The building will be constructed of concrete and steel, measuring 275 by 275 feet. It will cost $100,000.

Detroit, Mich.—The National Top and Curtain Co., organized to handle Jiffy curtains, has just announced the opening of a store on upper Woodward avenue near Willis.

Columbus, O.—Papers have been filed with the secretary of state increasing the authorized capital stock of the Buckeye Motor and Cycle Co., of Akron, from $5,000 to $15,000.

Philadelphia, Pa.—The Firestone Tire and Rubber Co., now located at 256 North Broad street, will, upon completion of its new quarters some time during October, remove to 304 North Broad street.

Phoenix, Ariz.—John A. McCondra has disposed of his interest in the Transcontinental Motor Co. to F. A. Carr, and that concern will hereafter be known as the Carr Motor Co. It will handle Reo, Krit and Abbott-Detroit. McCondra has formed a partnership with L. E. Hoeye and they have opened a salesroom at First and Monroe streets. They will sell Hupmobiles and Hudsons.

Mishawaka, Ind.—The Star garage has been sold to Robert Harvey, owner of the Harvey Auto Livery, operating in Mishawaka and South Bend. Guy Stutzman, former manager of the garage, has severed his connection with it and will devote his time to the sale of the Oakland, for which he is agent in St. Joseph, Elkhart and Marshall counties.

Springville, N. Y.—The Auto Pump Co. is moving its plant to Buffalo, N. Y. Most of the employes will move to Buffalo and continue in the pump company's employ.

Ottawa, Ont.—Stanley & Morris have been appointed local agents for the Mitchell Motor Sales Co. of Canada, London, Ont., Canadian distributor for Mitchell cars.

Boston, Mass.—M. E. Gamble has been appointed manager of the Boston branch of the Universal Motor Truck Co., succeeding to the position left vacant by the resignation of Charles Addison Malley.

Pulaski, N. Y.—The Pulaski Auto Supply and Garage Co. has leased the Selkirk building for purpose of conducting a general motor car business, of which G. C. Edick, Anselm W. Brown and George H. White are in partnership.

Syracuse, N. Y.—The capital stock of C. Arthur Benjamin, Inc., has been increased from $5,000 to $100,000. The present stockholders are C. A. Benjamin, Ernest F. Fuller and Harold L. Dyer. The object of increasing capitalization is to extend the business and provide for a new building. The company's garage is now at 410 West Onondaga street. A large structure is to be built but the site is not yet selected.

Manufacturers' Communications

SPEED OF THE STUDEBAKERS

DETROIT, Mich.—Editor Motor Age—The writer has been much interested in several letters, which have appeared in Motor Age from time to time, relative to the remarkable speed of the Studebaker—Flanders—20 motor cars. It may be of interest to those who have been discussing the question, as well as thousands of other owners of these cars, to know some of the very definite results achieved by the Studebaker Corporation in its experimental work with this car.

Laboratory tests had shown, early in the history of the car, that it possessed motor speed which, if not unique, was at any rate remarkable. To secure official data on this quality, it was decided to make a public demonstration. An official American Automobile Association sanction was accordingly secured, for a record trial at the Indianapolis speedway. Both before and after the trial, the cars were rigidly examined by F. E. Edwards, chairman of the A. A. A. technical committee, and pronounced strictly in accord with stock car rules.

The trial took place November 13, in rather unfavorable conditions. A freezing temperature prevailed and a wind varying from 20 to 30 miles in velocity faced the cars as they came down the stretch. Despite this, records for the class were established, from one to twenty miles. The trials were, of course, electrically timed. The records still stand in the American Automobile Association's table.

The 5-mile stock car record established by the Studebaker 20 was 4:22.98, an average of 52.6 seconds to the mile, or, 68.44 miles per hour. With a 3 4-7 to 1 gear and 30-inch wheels this required an actual motor speed of 2,700 revolutions per minute, which, however, was greatly exceeded on some parts of the 2½-mile circuit. In the mile where the car faced the wind its speed was greatly retarded. The fastest recorded by the timing apparatus was, in fact, :56.80—63.38 miles per hour—over this stretch. To accumulate a grand average of 68.44 miles per hour it is obvious that the car must have traveled the 1½ miles where the wind was either neutral or favorable, at a rate of about 48 seconds to the mile, or over 74 miles per hour. This clearly implies a motor speed of 3,000 revolutions or over, under load. This fact is particularly interesting in view of the opinion of the California correspondent of Motor Age who insists that no manufacturer ever has dared to claim such a motor speed for his product.

As to gear ratios and their relation to speed, it has been the experience of our experimental department that, on small tracks and average courses, best results can be obtained with the stock ratio of 4 to 1. This is, of course, true on account of the very high motor speeds which the car develops. A very large share of the track successes which these cars have won in contests all over the country, is undoubtedly due to the great motor speed which enables a driver to resume maximum speed quickly, after shutting off for a turn. The Indianapolis cars were, as I have stated, geared 3 4-7 to 1, but there are few Studebaker owners who can command a course like Indianapolis on which to extend their cars.—Studebaker Corporation, Paul Hale Bruske, contest manager.

EXPLAINS RACE MAGNETO TROUBLE

Milwaukee, Wis.—Editor Motor Age—Regarding the necessary withdrawal of Mulford's and Tetzlaff's cars during the Vanderbilt race at Milwaukee, I take this opportunity to advise that Mulford's magneto was taken down and reassembled by himself; in doing so he evidently did not assemble the ball race properly, which must have broken and caused the magneto to seize. Our mechanics were not permitted to overhaul this magneto previous to the contest. The driving shaft which operates the magneto on Tetzlaff's car broke, evidently due to his tremendous speed.—Bosch Magneto Co., A. H. Bartsch, advertising manager.

The Motor Car Repair Shop

Repairing Motor Tires

Part III

NOTE—The first article of this page is the third of a series of tire repair hints from a manual of the Goodrich company.

Splicing Inner Tubes

WHEN the tube has been badly pinched in assembling or blown out from other causes and is in such condition that patching is impossible, it then becomes necessary to put in a new sleeve by means of splicing. To make this splice cut out the ruptured portion of the tube with the scissors. Then use the splicer, an instrument consisting of two tubes, one of which fits inside of the other at one end and through which the ends of the tire tubes are passed and turned over like a cuff. Put one end of the tube through the splicer and turn it back over the end of the splicer about 2½ inches and put the other end of the tube through the center of the other splicer and turn it back about 5 inches. Then turn again toward the same end of the splicer, which will give a double lap, as shown at A, Fig. 1. Taper the edges of the tube with a sharp thin knife, so that the splice will not be rough. The surface to be joined should be roughed with a wire buffer or brush in the same manner as preparing for a patch.

These surfaces are then cemented and allowed to dry from 15 to 20 minutes. The splicer is then adjusted in position to unite, as shown at B. An air tube is then connected on the larger splicer and the curing solution applied on both ends of the tube. The tube from the larger splicer is then blown onto the other end of the tube on the smaller splicer, as indicated at C. To obtain good results the ends of the tube should be spliced immediately after the curing solution has been applied. It is then wrapped tightly with a rubber band or an old bicycle tube and kept under this pressure for 15 minutes. After removing the rubber bands and splicers the tube is ready for service.

Use of Air Bags

Insert the deflated bag into the case, using enough padding in the bottom of the case to fill out snugly. Several plies of fabric or a pad made from the carcass of an old case will answer the purpose. Screw the bead molds down snugly, then apply about 50 pounds air pressure, never more than 60 pounds. When the bag is not in use keep it inflated enough to be well rounded. Any air bag used in a size larger case than intended for it must be properly padded, otherwise it will soon be ruined. It should never be removed from a case by grabbing hold of the tube, as the latter will be torn sooner or later. Take the air bag by its lower end and force it out by putting the hand underneath it.

Marking Piston Rings

The amateur or junior repairman who removes the piston rings from a piston for the first time; either for the purpose of examining the piston-ring slots for sand-holes, or wear, or for cleaning the rings and slots, generally neglects to see that the rings are marked so that they may be replaced in their proper grooves. The result is, that considerable difficulty often is experienced in getting the rings back onto the piston in good order. To avoid this, one foreign manufacturer of motor cars marks the piston rings as indicated in Fig. 2.

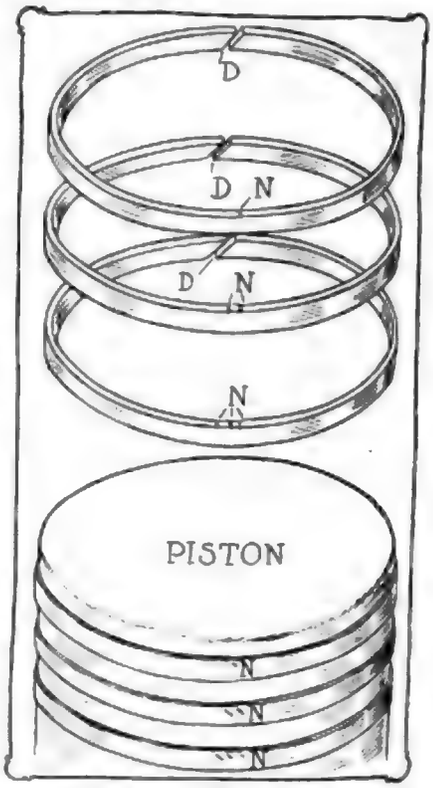


FIG. 2—METHOD OF MARKING PISTON RINGS

The rings in the top groove of a piston has one notch N in the upper, inner edge, opposite the diagonal D, where the ring is thickest. This notch is made with a file and is very small, so as to be visible, but at the same time not deep enough to weaken the ring. In a similar manner, the next ring below the one nearest the piston head is marked with two notches; the third ring from the piston head, with three notches; and if more rings are used a corresponding number of notches is employed to mark them. With rings thus marked there should be no difficulty in getting rings replaced in their proper grooves. Care should be taken, however when the rings from more than one piston be removed at the same time. In fact, it is advisable to remove, clean and replace the rings of one piston, before removing the rings of another piston.

Water in the Garage

Water is one of the cheapest of garage supplies, and in the washing of motor cars it is the most valuable; yet it is surprising how few maintenance garages have adequate washrack facilities. A mild stream of running water through a hose is the safest cleanser for fine coach work.

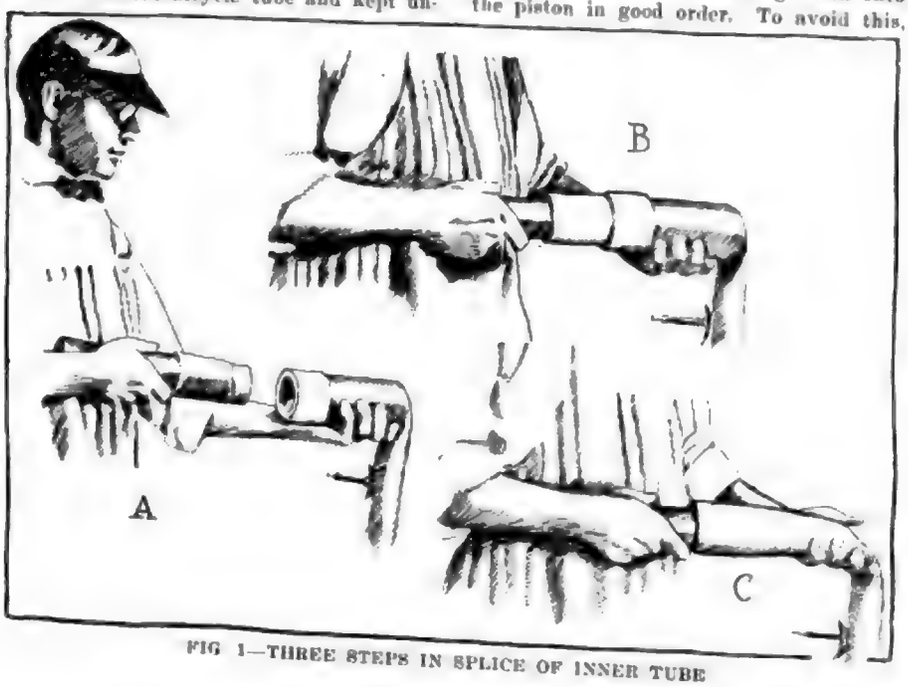


FIG 1—THREE STEPS IN SPLICE OF INNER TUBE

BIG WORK

Big work is hard work.

Big work is long work.

Big work is work that matters.

MOTOR AGE

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Contents

DEPARTMENTS

New Interests Buy Atlas Engine Plant

Lyons Brothers, Boiler Makers of Wisconsin, Secure Control of Indianapolis Concern and Will Build Silent Knight Motors—Deal Involves Million and Half Dollars—Owners of Sleeve-Valve Patents Not Financially Interested

INDIANAPOLIS, Ind., Oct. 15—The property of the Atlas Engine Works has been sold to the Lyons-Atlas Co., incorporated here today with an authorized capitalization of $500,000. The sale was made this afternoon by Fred C. Gardner, receiver for the Atlas company, with the approval of Judge Clarence Weir of the Marion superior court. It represents a $1,500,000 deal, the purchasers paying over $500,000 in cash and assuming all obligations. No stock is for sale, it is announced, neither are Knight & Kilbourne financially interested.

It is the intention of the new company to continue the manufacture of the Silent Knight motor, for which the Atlas company has had the trade rights in the United States and also the Deisel oil engines. The new company will employ from 2,000 to 3,000 men.

None of the people interested in the new company lives in Indianapolis. James W. Lyons is president; William P. Lyons, vice-president, and George W. Lyons, secretary and treasurer. James W. Lyons and William Lyons were identified with the Atlas company about 20 years ago. All of the stockholders in the new company have been engaged in the manufacturing business in Chicago. The Lyons are boiler makers with a big plant at De Pere, Wis.

The property was bought subject to a deed of trust from the Atlas Engine Works to the Indiana Trust Co., as trustee, but all personal property, merchandise, materials, patent rights, trade marks, accounts, bills receivable, etc., are conveyed outright free of liens.

Under the terms of sale the new owner is to pay $441,000 interest on $1,050,000 worth of bonds, secured by a mortgage deed of trust to the Indiana Trust Co. as trustee; also $105,000, an indebtedness incurred by $150,000 worth of bonds; also $48,187.04, a debt secured by $63,000 of accounts and bills receivable, and $80,000 in cash, to meet receivership expenses and debts incurred during the receivership. The new owner also agrees to pay judgments amounting to $6,700 against the Atlas Engine Works. The common stockholders will receive nothing.

The Atlas Engine Works was one of the oldest manufacturing concerns in the city. It conducted a prosperous business for many years, and at one time made a specialty of steam boilers, the manufacture of which it discontinued a few years ago. More recently it manufactured gasoline motors and Deisel oil engines, and a few months ago was granted the right to manufacture Silent Knight motors for the motor car trade in the United States.

Plans have been made to put the plant into commission at once. Since the appointment of the receiver there have been 400 men employed, but it is the intention to increase this force to 1,000 at once. The new concern has not set any high water mark on the production for the coming year. Its only fear is an inability to get aluminum castings, but it is believed this obstacle will be overcome easily. At the present time it has the parts on hand for the two models which the old Atlas company brought out—the four and the six-cylinder motors, each 4½ by 5½ inch bore and stroke, but in the immediate future it is planned to turn out other models, plans for which are now going through.

J. W. Lyon, the president of the new concern, will be the active head of the company and will move to Indianapolis. As to the other officials nothing has been definitely settled outside of the decision to retain F. H. Baker as general superintendent. Mr. Lyon is a gas engine expert and at one time was connected with Allis-Chalmers. He was instrumental in bringing over from Europe the Nuremberg gas engine, and also has been deeply interested in turbines.

WILLYS-GRAMM MATTER SETTLED

Toledo, O., Oct. 14—The suit brought some 2 months ago by John N. Willys, president of the Willys-Overland Co., against A. L. White and W. T. Agerter, former president and treasurer respectively, of the Gramm Motor Truck Co. of Lima, O., has been settled out of court. Mr. Willys alleged in his complaint that the values shown in the statements under which he purchased the stock of the Gramm Motor Truck Co. from White and Agerter, were not correctly represented, and sued for a rescindment of the purchase contract. The matter has been settled by a readjustment of values which, by his consent to a withdrawal of the suit, are apparently satisfactory to Mr. Willys.

REHABILITATING UNITED MOTORS

New York, Oct. 12—Announcement of the reorganization plan to be used in rehabilitating the United States Motor Co. along the lines of the article published in Motor Age last week has been made and progress toward completing the organization will come next. Under the plan adopted by the creditors the matter will be taken out of the hands of the United States district court as soon as the details have been worked out on a satisfactory basis.

The first step to be accomplished will be to formulate and send out to those interested as creditors and stockholders a legal notice of the agreed plan. Then will follow the call for deposits of the stock certificates and the issuance of new certificates under the schedule as announced.

The financial part of the plan will be carried out under a system of underwriting, the details of which have been completed but not announced.

There has been much talk about the personnel of the new company but no decision has been reached as to who will lead. W. E. Strong, who has acted as chairman of the board since the extension of credit last June, has been asked to remain with the new organization, but in exactly what capacity has not been outlined.

SHOCK ABSORBER SUIT ON

New York, Oct. 15—Motion for a preliminary injunction against Walter H. Ellis, doing business as the Ellis Motor Car Co. of Newark, N. J., was argued on behalf of the Hartford Suspension Co. before the United States district court of New Jersey at Trenton on Monday. Decision was reserved. The suit is one of several now pending, that have been started by the Hartford Suspension Co. to protect its rights under the Truffault patents covering the principles embodied in the Truffault-Hartford shock absorber. The alleged infringement, as outlined in the complaint, consisted in the selling by the Ellis company of shock absorbers made by the Connecticut Shock Absorber Co., which are alleged to contravene the rights of the complainant. The case probably will be brought to issue before the end of the year and may be heard before spring.

MIDGLEY CASE CARRIED UP

New York, Oct. 12—Appealing from the decision of United States Circuit Judge Platt, which was adverse to the patent of Calvin T. Adams covering a certain kind of tire tread in which wire was interwoven to give greater life and non-skidding properties, the Metallic Rubber Tire Co. and the Hartford Rubber Works Co. appeared before the United States circuit court of appeals last week.

The appellant is the assignee of Adams as to the patent in suit which is numbered 609,320 and granted August 16, 1898. The only claim contained in the application is as follows: "The combination with a cushioned vehicle tire, of a tread applied to the entire periphery of a tire, and having metallic wire interwoven with itself, parts of said interwoven wire lying substantially flush with the outer surface of the tread and forming cushioned arti-

slip bearings covering the sides and bottom of the tread."

The defendant company manufactures a tire known to the trade as the Midgely tread, which consists of embedding a series of wire coils in the rubber before vulcanization. It was claimed that the Midgely tread infringed the Adams' patent.

Judge Platt in the lower court decided that the defendant did not infringe, and the case went up in due order.

In the present hearing, the complainant's attorneys, Alfred Wilkinson and J. H. Roney, contend that the opinion of the court below was based upon an erroneous view of the prior art, particularly outlining the alleged worthlessness of several old British patents and holding that the terms of the patent were sufficiently broad to cover the Midgely construction.

The defendant's attorneys, F. W. Vaill and Livingston Gifford, argue for an affirmation of Judge Platt on the grounds that there has been no infringement because the wire is embedded in the Midgely tire and the Adams' patent applies only to interwoven wire.

As additional defenses it is alleged that the Adams' patent is completely anticipated by the Phillips' British patent of 1893; that in view of the prior art there is no invention; that the Adams' patent has been abandoned within the purview of the statute and that the claim is inequitable. The case apparently turns on the interpretation of the term interwoven as contained in the claim in suit.

ST. LOUIS SHOW A SUCCESS

St. Louis, Mo., Oct. 12—With a record attendance reaching a grand total of approximately 70,000, the most successful show ever held in this city closed tonight. It was given by the St. Louis Automobile Manufacturers' and Dealers' Association. The million-dollar display of pleasure cars, trucks and commercial vehicles, accessories and tires attracted visitors from all parts of the middle west.

The 1912 show was the largest ever held in St. Louis and had a greater attendance than any previous show. Some 300 1913 models of seventy makes of pleasure cars and more than sixty models of commercial vehicles were displayed.

As a business-getter for the exhibitors the show has been unsurpassed. The public repaid the exhibitors for their expenditure of money, time and effort. It is estimated that 200 cars were sold outright and the names of 3,500 prospects now adorn the pages of the dealers' lists.

Out-of-town manufacturers and factory representatives were in attendance in larger numbers than ever before and all were unanimous in their praise of the show.

AFFAIRS OF THE OHIO COMPANY

Cincinnati, O., Oct. 14—Apparently there is a sharp division among the creditors of the Ohio Motor Car Co., which is now in the court of common pleas under insolvency proceedings. One committee of the creditors has issued a statement recommending that the plant be sold on the block as quickly as possible and urging the creditors to bring pressure to bear to have the whole manufacturing force discharged instanter. This report is signed by J. S. Monroe, E. J. Hess and C. M. Stadelman.

The other report takes a rosier view of the matter. It denies the accuracy and good intent of the other committee and states that a careful appraisement having been made, it was found that the plant is worth about $200,000, not including bills and accounts receivable, good will and stock holdings in other corporations. That figure is over $20,000 greater than the total liabilities, according to the committee.

The appraisement referred to above was made by William J. Peck, August A. Geis and C. C. Evans, all engineers. The committee urges the creditors not to take any action until thoroughly informed of the facts. This report is signed by C. F. Pratt and A. E. Schafer. In the meantime the receiver, E. G. Schultz, has completed and sold one car and several Breeze buggies.

CREATING INDUSTRIAL COLONY

Lomax, Ill., Oct. 12—Plans have just been made public for an industrial university and manufacturing center that is projected for this city by the Lomax Town Co. The purpose of this organization is to build up a technical, scientific and industrial colony at Lomax to encourage individual industrial enterprise, and the development and training of American technicians. The plan as outlined embraces three principal divisions of the activity of the organization, including an industrial training and engineering college, an inventor's bureau and nursery, and a coöperative manufacturing district, all of which will be intimately associated, and all on substantially one campus.

OFFER FOR BANKRUPT PLANT

Newark, N. J., Oct. 14—The trustee acting in the matter of the bankruptcy of the Newark Automobile Mfg. Co. has reported to the United States district court that he has received an offer to purchase the factory building and real estate of the embarrassed company and also an offer to rent the same until December 1, 1913. A meeting of the creditors will be held October 21 to consider the offers.

S. A. E.'S 1913 SLATE

New York, Oct. 12—The following nominations have been made for the various offices in the Society of Automobile Engineers: For president, Howard Marmon; vice-presidents, Russell Huff and John G. Perrin; treasurer, Herman F. Cuntz; members of council, Joseph A. Anglada, Eugene F. Russell and Harold L. Pope.

The nominations were made by the regularly appointed committee on nominations and the election will be by mail vote in which all persons of either of the member grades may participate. The vote will not be announced until just prior to the annual meeting of the society during the second week of the New York show, about the middle of January. No exact date has been set.

The present roster of officers and the council is as follows: President, H. W. Alden; vice-president, Harold L. Pope; treasurer, Hermann F. Cuntz; chairman finance committee, H. M. Swetland; secretary and general manager, Coker F. Clarkson. Council, Henry May, Charles Ethan Davis, Howard Marmon, Charles B. Whittlesey, Arthur B. Cumner, Andrew L. Riker, H. W. Alden, Harold L. Pope, Hermann F. Cuntz, Howard E. Coffin and Henry Souther.

SUCCEEDS KELLY-SPRINGFIELD

Columbus, O., Oct. 14—Papers were filed with the secretary of state of Ohio recently, incorporating the Kelly-Springfield Motor Truck Co. of Springfield, O., with an authorized capital of $2,500,000. The new company will take over the plant and assets of the Kelly Motor Truck Co. of Springfield, which formerly was the Oscar Lear Motor Car Co. The capital of the former corporation was $450,000. The principal stockholders in the new concern are E. S. Kelly and J. S. Crowell, both of Springfield.

The object of the new truck concern, which is being backed by Emerson McMillen & Co., of New York, is to furnish facilities for increasing the plant of the company, which had an output of 1,200 trucks during the present year.

CONDITION OF RUBBER MARKET

New York, Oct. 15—Crude rubber has worked back to a basis of $1.10 a pound for up-river fine with little or no apparent reason for the upward trend. Consumers have not been aggressive in bidding for the firmly held but liberal supply and the trading on the advance has been somewhat smaller than was noted last week. On the other hand the sellers have not been liberal in conceding anything in order to make trades. Imports in New York are well up to the average. While pale crepe from the plantations remains steady at the former figures, approximating $1.16½ a pound, bales and sheets have yielded about 1 cent a pound.

GENERAL VEHICLE CHANGES

New York, Oct. 15—C. W. Squires, who has been assistant to the president of the General Vehicle Co., has been promoted to the position of sales manager. G. W. Wesley has moved up to vice-president in place of R. M. Lloyd. J. R. C. Armstrong heads the electrical engineering division and H. G. McComb has been named as head of the gasoline engineering division.

DYER LICENSE FOR CRAWFORD

New York, Oct. 14—The Crawford Automobile Co., Hagerstown, Md., has been granted a general manufacturing license under the Dyer transmission patents. The terms of the license are the same as those previously granted, namely: ½ per cent of the retail list price.

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Service to Buyer

THE keynote of service to the car owner was struck at the Indianapolis salesmens' convention last week. For the first time in their selling careers many of the salesmen realized that a boosting owner is the biggest active selling force that any dealer can possess.

UP to the present many salesmen—dealers are meant—went on the assumption that when the car was delivered the work was done. This is short-sighted salesmanship. Keep the buyer satisfied is the great aim. Give him service and he will be satisfied. Giving him service need not mean giving him a new clutch bearing after he has burned one out due to sheer carelessness; giving service does not mean selling gasoline at 2 cents a gallon under the price it can be bought at other places; but service means starting the owner out right with his machine, and giving him that rational advice and attention which his case warrants.

MORE repeat orders in pleasure cars are lost by poor attention by the dealer to the car owner than by faults in the car. Hundreds of cases are on record where the car owner liked the car but refused to have anything to do with the dealer. Such a dealer has to make a new sale every time he disposes of a car; his old customers rarely come back and place a repeat order. They do not come back to tell why, they simply go their way, preferring to do business with the dealer who gives them the service they want.

WHAT is the service they want? It is difficult to answer this question. The answer depends on the individuals who own the cars. Where the owner drives the car, he wants that service which will make him a competent driver, capable of getting the best possible out of his car. He wants to drive his car as it ought to be driven. He wants to give it that attention that it ought to be given. In a word, he wants to know how to handle and care for it rationally.

OVER half of the cars are not driven properly by the new purchaser. He gets his first car and has to become familiar with all of the many whims of it. According to many salesmen, nothing is wrong with it and, more, nothing can get wrong with it. It will never carbon in the cylinders; it will go 55 miles per hour on high; it will run 1,000 miles on a gallon of oil; it will make 25 miles per gallon of gasoline, and you "hardly ever have to bother with the other parts."

OFTEN the buyer takes the salesman literally. He does not put any lubricant into the front wheel hubs and after running 5,000 miles he finds some bearing trouble. He is told he should have oiled the bearings every 1,000 miles. The same salesman tells him this who volunteered the information at the time of sale that it did not require lubricant. He is told by the salesman to turn certain grease cups up every 2 weeks, but the repair man says they should be turned up every week and in heavy running every 100 miles.

THE dealer with salesmen giving such advice is going to lose out in the selling business. The merits of his product may carry him for a time, in spite of his own poor organization and poor methods; but the lane will turn and the dealer giving a little cheap, rational service in the way of common sense advice will win out.

SERVICE to the car owner means giving him rational advice when he asks for it. It means when he takes his car in to have it looked over that those who do the work are competent to do it, so that the car is not rendered worse instead of better. Service means salesmen who know what advice to give on the operation and care of a car when they are making a sale, instead of salesmen who are entirely ignorant of the operation of the machine and give the buyer false impressions.

THE repairman who, after making a simple adjustment or repair, uses every effort to conceal from the inquiring owner the real nature of what he did is a poor investment to any dealer. The car owner who wishes to know the whys and wherefores is not a parasite but a rational human being. He wishes to know when his car is operating well; he wishes to know when it is in order that he may properly operate the machine, which acts to his own advantage and also to the reputation of the machine. The dealer should constantly keep the pleased owner in mind.

Sane Road Racing

THE coroner's verdict following the lamentable accidents on the Milwaukee road race course has, for the first time, turned the attention of the public to road requisites for race circuits. The verdict suggests a definite width of course, a minimum road arch or crown, a road built for a period of 6 months or more, and a road with banked turns.

SOME of these suggestions are good; some bad. Requiring a certain road width, to-wit, 25 feet, is commendable, but that in itself will not insure freedom from accidents. Having the roadbed well hardened is essential and where the edges are not so the use of danger flags is imperative. The crowned road is one of the dangerous features of the road race. High speeds are dangerous on such roads.

THE banked turn is often more of a danger than a safety factor. The flat right-angled turn is one of the safe factors in racing. It cannot be taken at a dangerous pace. If the brakes are adequate, the turn has not any dangers. To insist on banked turns is retrogression.

THE mechanic is the vital factor in road racing. His duty is to look to the rear—to keep looking to the rear in order to warn the driver of cars that are trying to overtake them. If the mechanic does not do this, he is creating one of the greatest dangers in road racing. Many accidents have been caused by failure of the mechanic to carry out this part of his instructions.

Milwaukee Faces a Big Race Deficit

Dealers Estimate Their Loss Will Be from $25,000 to $35,000 —Move on Foot to Organize a Stock Corporation to Handle Classics in 1913—Bills Will Be Paid

MILWAUKEE, Wis., Oct. 15—The early estimates of the probable deficit which the Milwaukee Automobile Dealers' Association faces as the result of its conduct of the road racing classics in Milwaukee on October 2, 3 and 5, have now been increased from $25,000 to $35,000. It will be another week, at least, before Manager Bart J. Ruddle is able to lay an exact statement of the financial outcome of the big speed carnival before the association, but it is safe to say that the figure of $35,000 will remain as the minimum amount of the deficit.

Sentiment in regard to the continuation of race promotion by the M. A. D. A. is sharply divided among the members of the association, twenty-two in number. The feeling is general among the members that the association be relieved of the financial burden and active management of future race ventures and that it should properly be made a civic proposition rather than the private enterprise it actually was this year.

The lines are now being laid by progressive men of Milwaukee for the organization of a stock corporation, of which the M. A. D. A. as an association, or its members as individual stockholders, will be a part. Nothing will be divulged by the moving spirits in the stock corporation until the 1912 affair is entirely settled up and a final test of sentiment can be had from the M. A. D. A.

It is known, however, that the plans contemplate the formation of a corporation under the laws of the state of Wisconsin, with an authorized capital of probably $100,000, the principal and prime object of which shall be to promote and conduct the road races on the Wauwatosa course in Milwaukee county in 1913; the reconstruction of the 7.882-mile course; the donation of $25,000 in cash purses, etc. It is likely that the stock issue will be all common, divided into 1,000 shares of $100 par value each, and the number of shares which may be held by any one interest so restricted that the organization shall not become a closed corporation and make the participation general among public-spirited and civically enterprising business men of Milwaukee. Under a $100,000 capitalization there would be no possibility of a deficit, but even were this possible the responsibility would rest solely upon the corporation.

It is not known what measures the M. A. D. A. will take to meet the deficit of $35,000 or more incurred this year. An assessment of $1,500 upon each of the twenty-two members of the corporation is looked upon as the most feasible method, although it will mean a hardship to some of the smaller members. It is believed that some of the big interests of the city of Milwaukee, which profited most from the holding of the races here will come forward to help out in proportion to their gain.

It is announced positively that all accounts will be paid at once and that no creditor shall suffer by reason of the deficit. The $20,500 hung up in purses was paid promptly to the winners immediately after the last race. Salaries of officials also have been liquidated.

That there was something radically wrong in the system of collecting admissions on the ground seems to be proven by the well-founded statement that on grand prix day, Saturday, October 5, with more than 125,000 persons on the course, the actual receipts at the box offices on the ground were only $9,900.

It is stated that the farmers reaped no small harvest of loose change by taking cars and individuals into their property at a small charge per head. There seemed to be no provision for collecting admissions or parking space fees on any point on the course save the Burleigh street home stretch. There were hundreds of persons in the grandstands who wore no admission tags.

DE PALMA CONVALESCING

Milwaukee, Wis., Oct. 12—Ralph de Palma, winner of the Vanderbilt cup, will be dismissed from Trinity hospital by the end of this week, according to Dr. M. L. Henderson, chief of the medical staff for the races, and attending surgeon to the famous Italian pilot. The indomitable courage of the great driver, his fine physical condition and iron constitution enabled him to escape an almost certain death. On the day his physician pronounced him out of danger, visitors were admitted to his ward, and in answer to the question, "How do you feel?" he said:

"Fine! I ought to be out shoveling coal or doing some real work."

De Palma refuses to talk at length on the cause of the accident near the finish of the last lap of the leaders in the grand prix race. He is inclined to blame Caleb Bragg's mechanician for not watching the rear and signalling to his mate. De Palma displayed not the least of unkindly feeling toward Bragg, the winner, simply blaming the mechanician, who did not observe the rules, he claims.

"This accident will not keep me out of the racing game," de Palma said in a private interview with Mayor G. A. Bading, who, with hundreds of other prominent Milwaukee people have taken a deep interest in the little pilot's welfare and have showered him with flowers and keepsakes. "I have had accidents before and suppose I will have some more. It is a fascinating game and the call of the race is too strong for anyone who has experienced the sensations of racing to quit."

Bragg, the winner, caused quite a turmoil in Milwaukee last week by starting a tirade against everybody and everything. It seems that when he came to pay his bill at the garage where he kept his Metallurgique touring car he was astonished with a charge of $4 per day for 30 days, or $120. This charge was for washing, polishing and storage. Bragg stated that he never had been charged more than $2.50 per day anywhere in the United States and expressed the belief that he was held up. He visited the mayor in his office at the city hall the same day and after expressing his pleasure over the royal treatment he had been accorded by Milwaukeeans at large, he took a rap at the promoters, whose sole object, he declared, was to grab the almighty dollar.

In his interview with Mayor Bading Bragg said that from the standpoint of sport the Milwaukee carnival was not a success, because the management was in the hands of men of no experience, who had a commercial rather than a sportsmanlike motive.

BIG MEET AT FRESNO

Fresno, Cal., Oct. 12—The Stutz car driven by Earl Cooper won all the honors at the meet last Saturday. It captured two of the three events, broke the track record of :55⅕ made several years ago by Barney Oldfield in an exhibition event. The Stutz time was :55. Eleven thousand people witnessed the races, but owing to the one sided nature of the events there was little enthusiasm. Summary:

Five miles, 231-300 class—G. L. Weathers, Mercer, won; Lewis Bravel, Warren, second; time, 5:15⅕.

Ten miles, under 450 inches—Earl Cooper, Stutz, won; Sulprizio Denta, Buick, second; G. L. Weathers, Mercer, third; Lewis Bravel, Warren, fourth; time, 9.57⅕.

Twenty-five miles, free-for-all—Earl Cooper, Stutz, won; Earl DeVore, National, second; Warren, Buick and Mercer, started but did not finish; time, 24:53⅕.

Exhibition to break track record of :55⅕ by Earl Cooper, Stutz, :55; G. L. Weathers, Mercer, :59.

RACING AT SPRINGFIELD

Springfield, Ill., Oct. 12—Two local mile track records were broken here today at the motor races held in connection with the state fair in progress this week. Louis Disbrow, driving the Simplex Zip, lowered by 2 seconds the track record of 53⅕ seconds for the mile held by Barney Oldfield in the Blitzen Benz. Disbrow also lowered Kirscher's former record for 2 miles on this track. These were two of the nine

Cherry Circle Motorists Win Match

Team Contest Between Chicago Athletic Association and Chicago Automobile Club Attracts Twenty Contestants Who Visit George Ade, the Playwright

CHICAGO, Oct. 14—Winding up the 1912 series of team matches, the Chicago Athletic Association's representatives decisively defeated the Chicago Automobile Club in the fall run for the Allen S. Ray and Carleton White trophies, making the sixth victory for the Cherry Circle in the seven times the two clubs have clashed. Nine of the C. A. A.'s ten cars were perfect, while the C. A. C. had four of its ten penalized. A new scheme was tried in the run of Saturday—that of giving 5 points credit to a team for each perfect score it turned in. As the C. A. A. only had 13 points against it and was credited with 45 for nine perfect scores it won the match with a mark of 32 plus. On the other side, the C. A. C. had 263 points against it and only 30 points credit, so its score was 233 minus. Because of having the best total the C. A. A. won the Ray trophy and because of having the greater number of perfect scores it added the White cup to its collection.

The run was a 1-day affair instead of the usual 2, the noon control being located at the Hazelden farm of George Ade, the playwright, at Brook, Ind., a distance of 90 miles. Threatening weather the night before, when it rained hard, kept down the size of the field and so only twenty cars went to the tape. But those who did drive had a most enjoyable outing, for the sun came out, the roads dried up and it was a joy ride both ways. At Ade's the Daughters of Ruth served the luncheon and at the finish the losing team paid for the dinner at the South Shore Country Club.

Penalties exacted were mostly for stalled motors, but in the case of A. M. Robbins, who got the maximum penalty of 250 points, broken shock absorbers brought on penalization that put the C. A. C. out of the running completely. It took Robbins so long to complete the repairs on the accessories that he was just reaching the noon control as the last car pulled out on the return journey. The report of the judges was as follows:

CHICAGO ATHLETIC ASSOCIATION

No.	Driver and Car	Plus	Minus
2	C. T. Knisely, Diamond T	5	0
4	W. F. Grower, Diamond T	5	0
6	S. E. Hibben, Packard	5	0
8	H. C. Knisely, Premier	5	0
10	A. Ortmeyer, National	5	0
12	S. W. Hamm, Cole	5	0
14	W. C. Thorne, American	5	0
18	J. W. Hayden, Nyberg	0	13
20	A. J. Banta, Locomobile	5	0
22	L. T. Jacques, Peerless	5	0
	Total	45+	13—

Grand total, 32 plus.

CHICAGO AUTOMOBILE CLUB

No.	Car and Driver	Plus	Minus
1	Morton H. Luce, Velie	5	0
3	H. A. Ford, Premier	5	0
5	G. F. Ballou, Apperson	5	0
7	A. M. Robbins, Abbott-Detroit	0	250
9	F. E. Mann, Locomobile	5	0
11	Frank X. Mudd, Lozier	5	0
13	H. P. Branstetter, Kissel-kar	0	3
15	W. R. Roberts, Cadillac	0	7
17	F. A. Yard, Inter-State	0	3
25	C. G. Sinsabaugh, Premier	5	0
	Total	30+	263—

Grand total, 233 minus.

Each C. A. A. driver with a perfect score gets a miniature White cup given by Fred Grower, while each C. A. C. pilot is to get a small Ray cup from Frank Mudd.

events of the meet which were witnessed by 30,000 people. Summary:

Five miles, 231-300 class—Nikrent, Case, won; Ulbrecht, White Streak, second; time, 5:34⅘.

Five miles, 301-450 class—Will Endicott, Case Tornado, won; Madden, Inter-State, second; Luttrell, Stutz, third; time, 5:10.

One mile against time—Disbrow, Simplex; time, :51⅕.

Five miles, class E handicap, 300 cubic inches and under—Ulbrecht, White Streak, won; Nikrent, Case, second; Monckmier, Staver, third; Parker, Falcar, fourth; time, 5:13⅕.

Three miles, 301 cubic inches and over—Disbrow, Simplex Zip, won; Endicott, Case Tornado, second; Kilpatrick, Hotchkiss, third; Luttrell, Stutz, fourth; time, 2:56⅘.

Ten miles—Illinois club championship race, under 601 cubic inches—Nikrent, Case, won; Luttrell, Stutz, second; Parker, Falcar, third; time, 10:28½.

Two miles, against time—Disbrow, Jay-Eye-See; time, 1:47⅘. Previous record for track, 1:47⅘.

Five miles—Disbrow, Simplex Zip, won; Ulbrecht, White Streak, second; Endicott, Case Tornado, third; Kilpatrick, Hotchkiss, fourth; time, 4:36⅘.

LITTLE GLIDDEN STARTS

Des Moines, Ia., Oct. 13—After three postponements the third annual Little Glidden tour of the Iowa Automobile Association left Des Moines early this morning for an 830-mile trip over Iowa. Five days will be consumed on the run and a complete circuit of the state will be made. The run is sanctioned by the American Automobile Association and C. A. Kneedler, of Sioux City, representative of that body, will referee the reliability run. Non-stock cars only are entered.

Ten cars left Des Moines and while these are the only ones actually entered in the contest there will be hundreds in the run during its course around the state. Never before has so much interest been taken in the Iowa reliability run. It will well serve its purpose, that of reflecting the great interest in good roads work in Iowa.

The run left Des Moines over the River-to-River road, but a greater part of the trip to Council Bluffs, which has the Tuesday night control, was made over the White Pole road. Wednesday the tour followed the Missouri river to Sioux City for the second night control. The third day out the tour used the Hawkeye highway between Sioux City and Ft. Dodge. Cedar Rapids is the night control for the fourth day, the noon stop being at Waterloo. The final day's run is back to Des Moines by way of Iowa City and Washington, following the I. O. A. short line and the east branch of the White Pole road.

GLIDDEN STARTS SOUTH

Detroit, Mich., Oct. 13—Charles J. Glidden was given a warm reception and send-off yesterday when he started from here on his 1,700-mile trip over the lakes to the gulf route in his Maxwell 40, the route selected for the national tour, which was abandoned. Mr. Glidden was given a dinner Saturday night by the national tour start committee which planned the Glidden tour reception. Homer Warren, postmaster and president of the Board of Commerce of Detroit, was toastmaster.

MEXICO ENCOURAGES TOURING

Laredo, Tex., Oct. 12—It is expected that the new ruling by the United States credit department relating to motor car tourists crossing the Mexican and Canadian borders, the effect of which is that there shall be no duty charged on the cars, the only requirement being that the machines must be inspected, will result in a great increase in this class of travel into Mexico through the Laredo and Eagle Pass gateway as soon as the political disturbances in that country are settled. The new ruling fixes 6 months as the time limit set on this free return of the cars into the United States. During the last few years many motor car enthusiasts from the north and east have found enjoyment in bringing their cars to San Antonio and spending a part of the winter driving over the good roads of that section. Much work has been done during the last several months in the highway system of southwest Texas and the construction of a motor road between San Antonio and Laredo is well advanced.

BETTER ROADS THEIR CRY

Indianapolis, Ind., Oct. 14—Committees representing the various commercial bodies of the city have arranged for a meeting to be known as the Indiana better roads convention to be held in this city December 11 to 13, inclusive. It is hoped to bring a road machinery exhibit that will be shown in Cincinnati during the previous week to the city for the convention.

The meeting is to be devoted largely to a discussion of proposed bills to be brought before the Indiana legislature next year. It is thought one bill will be outlined creating a state highway commission and that another bill that will be proposed will provide an annual tax.

facturers. The motor car departments of the newspapers must have something to talk about—they must have real news—else they cannot survive. When there are no more races, motor car contests, hill-climbs, then there will be no more newspaper support. It is up to the makers to enter these things to furnish news for the press, and to keep motor news alive.

S. A. Seiberling, president of the Goodyear Tire and Rubber Co., Akron, O., delivered a masterly talk on the future of the industry. The industry has written one of the most spectacular pages in the history of the world, he said. For the coming year, he predicts the following: Value of the motor industry for 1913—$450,000,000; value of the accessory industry for 1913—$450,000,000.

At this rate, 10 years from now the motor car business and its allied interests will have a value more than four times greater than that of the great Pennsylvania railroad system. And when we shall have developed and taken advantage of our roads and highways by using motor cars on them, the motor industry will be worth more than the entire railroad interests of the country. The dealer is the medium for this great growth.

But, continued Mr. Seiberling, the dealer of the past had an entirely different problem from that with which the dealer of the future will have to cope. Cars must henceforth be sold, whereas, in the past they have been bought. Service in the future must begin when the car is sold. The dealers in each community have problems which are local to that territory, and these must be solved by cooperation.

H. L. Liebricht of the Export Advertising Co. spoke of the possibilities of extending foreign motor car trade. In foreign countries, all realize that the medium-priced American car has no equal. But the greatest drawback to the sale of American cars abroad is this question of service. The European manufacturer sells more cars in South America than does the maker from this country, simply because the buyer can get their cars repaired rea-

"Point of Contact" by Le Roy Pelletier

Flanders Advertising Expert Addresses Indianapolis Convention

By E. Le Roy Pelletier

BUSINESS is warfare, but is not necessarily guerrilla warfare. There are rules to the game and it is fair to play them. I cannot but feel respect for my competitor so long as he plays the game fairly, no matter how hard he may press me. I love my strongest competitor best. That is the principle we are working upon in Detroit. When a man in my line in Detroit is asked something about the other fellow, he will say, "He must be good or he could not be in our business; he must be splendid because nobody could stand the strain if he were not." We push him as hard as we can, but we have never got him over the edge yet. I think that is what the dealer should talk. The engineer will tell you that every man who builds a motor car honestly tries to build a good car; but there are a thousand different forms that can be used.

One engineer says this is the important factor; another says this is the factor of paramount importance; the other says this, the other that and so on. And yet each one builds a good car. You can say this to a customer and get more out of him than by trying to persuade your customer that the fellow across the road is a thief and rascal, and the other fellow over there never did a good thing in his life. Such a course only tends to discourage the prospective purchaser and causes him to hesitate to deal with anybody.

The topic that was given to me by Mr. McKee, who arranged the matter, was "The Co-ordination of Sales and Advertising." That is a consummation devoutly to be wished for; I believe it was Mr. Milton who used that expression. If we could ever get co-ordination between the advertising and sales there is nothing that we could not do. We advertising men look forward to that time and we are working for it and trying to attain it. You know advertising is your silent but most eloquent partner. While you are joy-riding advertising is working for you. After you have gone to bed in the evening some man is going over your advertisement trying to decide what car he will buy. Probably the man, who was not a prospect yesterday, is a prospect today. You must bear that in mind. Don't say, "I called on Smith 6 months ago and he didn't want a car." If Mr. Smith has read your advertisement, and he probably has, remember that it has been working upon him and he may now be in a much different frame of mind. Even last night his wife and he may have been reading over an advertisement, and got talking about it, and if the early bird happens to come along today there will be something doing immediately.

The field is limitless. A stable of cars is a very ordinary thing nowadays. The minute a man buys a $5,000 touring car he must have a runabout. He must have a business runabout. The minute he gets that his wife needs another car for her own use about town—an electric for town purposes. Then he gets four or five motor trucks which he uses instead of horses. And right there the average dealer is losing sight of an opportunity. I believe, because he does not realize the side lines in trucks and electrics, and in going to a man who has a—"Blue car"—I must not mention it, must I? I think it is blue, isn't it?—and telling him he needs a runabout, as I say, the field is practically limitness.

The main difficulty we have in our selling—well, they tell me I must not talk about anything in particular, but it is pretty difficult for me not to; so our toastmaster said if I slipped in a wrong gear he would kick out the clutch on me.

I was going to say that the great difficulty that we at headquarters have in the sales and advertising department is in getting the dealer to understand that the large amount of money that we spend in the national campaign is spent for his benefit entirely. I say his benefit entirely—he is there for our benefit entirely—no doubt about that; we cannot live without him.

But big business is a problem in selling. Mr. Smith puts it lightly, there are departments of selling, manufacturing and organization; but he says the one big problem after all is selling, and that is why we are interested in your welfare. It is a purely selfish interest, but a genuine one.

Speaking of that difficulty in getting the co-ordination—as Mr. McKee puts it—of the sales with the advertising, I am reminded of a very educative talk of Tom Dockerel on the subject of efficiency in salesmanship. I am going to quote him and tell you where I got it, and if you ever have a chance to hear that long, lanky Irishman, do it. He says the point of contact is the one problem in all sales campaigns, and he illustrates it this way: He says, "Suppose I say to you 'John Wanamaker.'" Immediately there comes into your mind the picture of a pyramid, because the pyramid is a figure or structure, the base of which stands firmly upon the earth and the apex stands towards the sky. Now, John Wanamaker sells corsets. He sends a man to Europe to investigate corsets. They have big factories over there and he sends engineers to Europe to investigate and find out if they have anything of value there. They used to have something to send us back. Nowadays we have something to send them. He buys a lot of expensive models and brings them home. He puts in an expensive window display. Then the expensive advertising man puts in a display of corsets. Then appears the woman who has read about them and seen the display, and when she enters what does she find? Not the pyramid, this colossal, solid structure with John Wanamaker standing upon the apex, but instead of that she finds an inverted pyramid, the apex of which stands on the head of $4 a week Annie, who does not know anything about the real merits of the corsets, and the whole thing goes to smash.

Now there is something about the gasoline car, the speed of it, that gets into a man's blood and it calls for a rather different kind of salesmanship than the electric car, but I find that as compared with the gasoline car the electric is more difficult. For instance, about 4 or 5 years ago, selling an electric that is not now on the market, I went down to Philadelphia thinking it an ideal electric town; that everyone ought to have electrics. I went down there and put on some stunts and put over a great advertising campaign, and then awaited results. Shortly a woman came in the store, and we had a man there, a great racing buck—I have forgotten who, he may have participated in the Fairmount Park races in which he was second or third. So I was standing in the store waiting to see what would happen. In came the woman. She looked at me and she looked around and she looked at the electric which had a wheel base shorter than the top, and she said, "Is there anyone in charge here?" I said, "Yes, the man under the car is in charge." All there was to indicate the man was a couple of legs sticking out from under the car. That was the point of contact.

She evidently was disappointed. She evidently expected to see something more than a pair of legs sticking out from under a car. Finally he scrambled out from under the car and with his arms all covered up with mud and gum he approached the woman and said to her, "What can I do for you?" She replied, "I want to look at an electric." He said, "Oh, yes, over there is the electric." She kind of stood and looked at him. He said, "Do you want to buy an electric?" She said, "Well, I was just looking." "What do you want to buy an electric for," he asked. "Why, I——." He asked again, "What do you want to buy an electric for? Why don't you buy a gasoline car?" She said, "I don't know. I read the advertisement last night and I came in to ask you why I should buy an electric." He says, "Search me, I don't know." He didn't know why anybody should buy an electric.

Another case that came to my notice the other day was down in the southwest where a big concern was trying to solve the second-hand problem. It advertised amongst the dealers a lot of used cars at very attractive prices, some of them as good as new. So the gentleman who was speaking of it said he went up and went into the sales manager's office, and he informed the gentleman in charge that he was interested in used cars. "Oh, yes, yes," said the gentleman. "Billy, take this gentleman out and show him those used cars." "What, in the lemon room," said the kid.

There is another example of point of contact. They had $4 a week Annie beaten to a frazzle.

That is a feature that you butt into all the time in the business. We put out a car that our engineering force has put their heart and soul into, and think that they have done the best thing yet, and then we send a large amount of money to advertise nationally, and we expect the dealer to go into his local city and supplement that advertising—we expect him to read the advertisement and try to believe it, in spite of the fact that the customer has read it, and we expect him to meet the customer with the same line of argument, because when a man is told a thing once and then hears the same thing twice he is inclined to believe it, and the third time he is sure to believe it; but if the dealer doesn't care a cent what is in the ad, and is not able to meet the customer on a proper basis of understanding, and is not prepared to meet a customer at all, in fact, as for instance, when the

sonably and quickly. There are many openings for American garages, where American cars are understood.

Ninety-five per cent of the chauffeurs abroad are Italian, Swiss or German, and these men do not understand the American car. They cannot repair it. Consequently, there is much demand for the American chauffeurs. There is an opportunity for many a young American in this business, therefore, in foreign lands. In all foreign countries, new roads are being built which broadens the field for cars. Last year Venezuela appropriated $285,000 for good roads, and she will set aside $400,000 for the same purpose for the coming year. The foreign field is unlimited.

F. M. Crawford of the International Correspondence Schools discussed practical motor car selling, saying that no factory is stronger than its selling organization.

The speakers at the various sessions of the convention were without exception masters of the subjects which they discussed. Most of them had years of valuable experience back of their remarks. A curious feature of the speeches was that all were extemporaneously delivered, and being so given, they were all straight out from the shoulder.

The opening address was delivered by J. J. Cole who welcomed all to the city—the second in the industry. Others who spoke Tuesday were H. O. Smith, president of the Premier company; C. F. Kettering, president of the Dayton Electric Co.; E. Le Roy Pelletier, of the Flanders interests; former Mayor C. A. Bookwalter, of Indianapolis, and Elbert Hubbard.

Pelletier made one of the most entertaining speeches of the meeting. His talk on the "point of contact" was most interesting, for he showed how a sale could easily be made or unmade by the attitude of the dealer to whom the prospective buyer comes. In order to properly receive the man who has come to the salesroom in response to an advertisement, it is very important for the dealer to be thoroughly acquainted with whatever has been said in the advertisement.

Selling Cars as Viewed by H. O. Smith

Excerpts from Speech of the Premier President at Indianapolis

By H. O. Smith

I BELIEVE that the selling problem is the big problem, not only with the motor industry, but with every other line of industry. I believe a good dealer can hold up a poor car a little while, but a poor dealer can not hold up a good car very long. Therefore, you see that I place the greatest stress today, with the great development of the motor car on the distributor. The development of the motor car and the demand are very natural. It is strictly in line with the times. It is based on the transportation problem.

I don't know of anything to say which even promises to rival the motor car as a solver of the transportation problem. We have our railroads which connect our cities, but you have the motor car which takes you to your homes. In other words, it is without limitation. I think without any desire to reflect on anyone that the demand for the car today is practicable to the going motor car and not to any well organized educational campaign.

As a matter of fact, is it not too often true that the individual who has become attracted to the motor car is interested because of its worth, practicability and usefulness, and has dropped in to see the salesman, with the result that we see upon all sides? Isn't it so—that if the salesman could not say enough detrimental about his competitor's car, this man became a buyer? I don't think this is quite as generally true today as it was in the earlier days, but what I am thinking is, that if we would all educate our salesmen to first-off establish interest and confidence in the motor car generally, and a special interest in our own individual problems, we would rapidly broaden the interests, and I am not sure that we would not make more sales.

Take the salesman of today—the average salesman that is employed. Is it not true that when he first comes to us he presents a list of prospective buyers? Now, follow down this list and what do you find? You find that his list almost invariably includes or is confined to those who today own motor cars, who already are converts to the use of motor cars; but he has conceived the idea that if we pay that man enough money and buy his old car at an attractive enough price to the other fellow, he possibly can place another new car with him. But I want to ask you as practical dealers, have you broadened the influence and scope of the motor car one particle until you have placed that traded-in car, provided it is of any use, if there is any use left in it? I say, No. Of course, we can not entirely get away from this trading problem, and it is one of the big problems we are all confronted with and wrestling with; but I believe this: as soon as we get to the point where we do not pay any more for the second-hand car than the second-hand car is really worth or will sell for, that the second-hand car problem will to a very great degree take care of itself.

The manufacturer has two problems—producing and selling. In the selling department every broad gauge distributor must recognize that the dealer associated with his interests is a part of his selling organization, and why should any dealer join with any distributor who is going to be careless as to the welfare of any part of his selling organization?

I think, gentlemen, that you will agree—we must all agree when we study this subject, that we have only scratched the possible surface of the demand for the motor car. The big problem with us today is not—Can this country absorb 200,000, 300,000, 400,000 or 500,000 cars in a given period? As I see it, the question with us today is—Will we develop the uttermost buying power as soon as those cars are delivered?

I could name you one city in the United States which last fall, according to the record, had one motor car, I believe, to every nineteen men, women and children, and yet that city proved to be one of the best markets of the past season. This only gives you a suggestion of the great possibilities that are before us.

The motor car today is a practical conveyance. It was started as a fad or a luxury; but through its own worth and practical performance it has lifted itself out of that place and worked itself into the sphere in which it is now placed, and I think it will be less than 5 years when we will see, looking at the commercial side of this proposition, the huckster who today is making only 5 or 6 miles of the city and compelled to do his work on land valued at $100 to $1,000 per acre, with good roads and the motor propelled vehicle, instead of being located in or very near to the city limits, will be operating 5, 10 and 15 miles from the city on $150 to $200 an acre land.

And there is one of the keys to your cost of of high living—or rather the high cost of living.

We may all figure without a question on the permanence of the motor car. Why? Because it is a practical proposition. Its demand is on a practical basis. You need not fear anyone who has once kept it, the use of the motor car reverting to the old methods if it is possible for him to continue to have an automobile. It would be just as reasonable for us to think of us turning back to the prairie schooner or the horse-drawn street car as to go back to the old methods of transportation.

Discussing this proposition from the manufacturer's viewpoint, and considering the dealer's point as well, I think it is of much more importance that the dealer selects well his line; to be sure that he has not only what he considers the best selling line on his floor, but beyond that to be sure that he has enough confidence in that line and gives it sufficient support to do the line justice. If you do not possess full confidence in your line, how are you going to induce your possible buyer to have it?

The dealer today in many instances when he approaches the manufacturer first asks, not for "Let us see what the details of your product are," but "What is your discount?"

I think there is one of the things we might all think about very seriously. The manufacturer is entitled to a fair, legitimate profit. The dealer is entitled to a fair, legitimate profit. But there is a limit to what represents a fair, legitimate profit.

woman came in before looking at the electric and found him with his arms all begrimed, it is all off.

Another mistake that the dealer makes is this: There is an awful lot of good repair men stores are trying to make salesmen of them. If a man is a better repair man than salesman he ought to hire a salesman; and vice versa, if he is a better salesman than repair man, then he should hire a repair man and do the selling himself. If he has but a small place and has to do both, then he should have his repair department separate from his sales department.

There is nothing that so absolutely destroys all possibility of a sale as to have a person come into a show room, which occupies the front part of the store, and hear a car back there spitting on two cylinders. When a thing like that is going on the customer goes back to see what is the matter, and the dealer hurries after him and says, "No, that is not the car I want you to see; this is the one I want to show you." "Yes, but this is the one I want to see," says the customer, and the effect is bad. Point of contact again, you see.

There is no use for the expenditure of money and the employment of an engineering force and advertising force—it is of no value when we lose sight of the point of contact; when we send a customer into a store and the dealer baits up the sale. I must say this—even though you who are listening may not like it.

Now, there is not as large a percentage of salesmanship in the car business as there is in some other lines. Take, for instance, the typewriter companies, the Burroughs adding machine. How often do you suppose a man goes in to their places and asks for a cash register or adding machine? Not very often. But the salesman follows his man up. He goes in and says, "Bradstreet tells me that you do a certain volume of business. You need an adding machine. Don't tell me that you don't. You need an adding machine. You ought to have one. I can show you that with the volume of business you do it will be an economy to you." And there is only one kind of a report that such a salesman can ever send back to the factory—one is an order and the other is a burial certificate.

Now, we in this business have not done any real selling at all. The main part of the work has been standing back and telling the customer "We hope to deliver a machine next week. We were promised a machine last week but we did not get it. The business has been coming faster than we expected it." There is not one of us who can explain why. The customer knows he needs a car a blame sight better than we can tell him as a general thing, and all we need to do is to try to tell him which one he wants. But when he comes in and we proceed to tell him about the defects of machines, and we say, "This machine has a rotten rear axle" and "That machine has a bum starting device," and so on through a long list of defects that rival machines possess, when we get through he says, "Why, there are fifty or sixty different ways that a car can go wrong, and I don't believe I dare to take any."

Cotton Outlook Encourages Dealers

AUSTIN, Tex., Oct. 12—Cotton picking may be said to be finished in south Texas and the fields are rapidly being cleaned up in central Texas. Most of the gins in the extreme southern part of the state have closed down and in the middle upper portion they are now running only 2 or 3 days a week. The weather has been most propitious for gathering the crop, and while the shortage of labor interfered very much in some localities with the work, the outcome of the season is one of the best in the history of the industry in Texas.

In north Texas many of the fields are white with the staple and it will be some time before the harvesting is finished. There is a brisk movement of Mexican laborers from the southern and central portions of the state to the farms of the northern part and the labor shortage in the latter region is being rapidly overcome. With good weather the crop of the whole state will be harvested 2 or 3 weeks earlier than usual. Much will depend on the lateness of frost. If there is no damage from this source there will be a large top crop in north Texas and an extraordinary heavy yield in the western part of the state.

According to reports of bankers and merchants throughout the state farmers are meeting their obligations to these classes of creditors to a greater degree than ever known. This very satisfactory condition is attributed to the rapid marketing of the cotton crop and the good prices that are being obtained for the product.

Another noticeable effect of the prosperous condition of the farmers in the older cotton growing region of the state relates to the character of investments they are making with their surplus money. Many of them are purchasing cheaper lands in the former ranch region where cotton growing is becoming an important industry and are providing homes for their grown children. Others are taking stock in manufacturing enterprises and broadening their scope of industrial endeavor in other ways. First of all, however, the average well-to-do farmer who is not already provided with a motor car has either ordered one of these vehicles or contemplates doing so. The motor trade probably is receiving more direct benefit from the present general prosperity of the people of Texas than any other one line of trade.

It is stated by dealers in motor cars that their orders during the last 2 weeks from farmers have exceeded all previous records for a similar period and that the prospects are favorable for an increase in this trade during the remainder of the present year. St. Louis, the consensus of opinion was, is the most promising field in the United States today.

Success of Crops Means Many Car Sales in State of Texas

Estimates by responsible persons in the trade as to the amount of business that will be done in this city in the next year ranged from $9,000,000 to $15,000,000. Counting the sales which will probably be made in the St. Louis territory by St. Louis agents or subagents the amount of business has been estimated as high as $200,000,000. This estimate was made by one of the largest distributers of the St. Louis territory and included a larger part of Missouri, Illinois, Texas and a part of the south and southwestern states.

PRIZES FOR ILLINOIS DRIVERS

Springfield, Ill., Oct. 14—Awards in the tours to the state fair promoted in connection with motor day last Saturday have been announced. More than 100 cars participated in the contest, which consisted in tours from various counties in the state to Springfield. The winners were:

Tour 1—W. O. Guyton, Aurora, first; Mrs. G. H. Deane, DeKalb, second; J. I. McKown, Bloomington, third.

Tour 2—P. W. Kempster, Prophetstown, first; F. D. Miller, Fairdale, second; A. M. Smith, Stockton, third.

Tour 3—Ira Dodson, Joy, first; Mrs. W. J. Sweeney, Rock Island, second; Dr. B. E. Jones, Rock Island, third.

Tour 4—John T. Garm, Beardstown, first; C. J. White, Beardstown, second; Martin McDonough, Beardstown, third.

Tour 5—T. C. Nichols, Quincy, first; Dr. G. A. Lierle, Beverly, second; Allen R. Fry, Mt. Sterling, third.

Tour 6—J. H. Friedline, De Soto, first.

Tour 8—John Swick, Newton, first.

Cass county won the handsome Miller trophy for the county, with the most mileage in the tours. The total from Cass was 784 miles.

Automobile Blue Book prizes—To contestant having the most mileage—Mrs. G. H. Deane of DeKalb, with 341.6 miles. To the woman driver making the best record—Mrs. W. J. Sweeney, Rock Island; Mrs. Deane made the best record for women drivers, but the conditions were that two books could not go to the same person, and Mrs. Sweeney made the second best.

TWELVE IN DESERT RACE

Phoenix, Ariz., Oct. 11—Entries for the desert road race closed yesterday. Three Cadillacs, Buick, Franklin, two Americans, Schacht, Simplex, Hupmobile, National, Mercedes are entered.

The A. A. A. has sanctioned another race from San Diego to Phoenix, also starting October 26.

BREWER'S VIEWS ON AMERICA

London, Oct. 7—Robert W. A. Brewer since his return to England after a tour of inspection of American factories has put forth some of his views comparing American and British methods of manufacture which are especially interesting. England is at present all stirred up over what it is pleased to consider the menace of the cheap American car, and, therefore, has been reading Mr. Brewer's conclusions with great avidity.

The most remarkable feature of American manufacture which he mentions is that workmen can go to work at 7 A. M. and quit at 4:30 P. M. and still turn out a quantity of work which the British workman cannot nearly equal in a 12-hour day. The American treatment of workmen as practiced in American motor car factories was new to him. Systems of gauging and inspection as practiced in America, he thought, responsible largely for the resulting excellence of these so-called cheap cars, and he warns the British public against believing what they have been told that they are atrocious pieces of workmanship and material and will go to pieces after a few months' use. "On the other hand," says Mr. Brewer, "they are really very excellent little cars."

"The reason why the American car is cheap," he says in substance, "is that everything is systematized. Every man and machine works at maximum efficiency. A skilled man who is paid high wages to do a particular job simply does that job and the skilled part of it. The work is handed to him by a lower paid workman and another removes the job. He does not even have to turn around in performing the whole operation."

A large part of Mr. Brewer's conclusions are based on observations at the Ford plant in Detroit, Mich.

GRABOWSKY ORDER MODIFIED

Detroit, Mich., Oct. 16—An order modifying the injunction filed by John C. Kimble on September 17 against the Grabowsky Power Wagon Co. of this city was signed and filed in the Wayne county chancery court on October 14. The original injunction as filed by Kimball restrained the Grabowsky concern from carrying on business as well as preventing its sale. The intention of Kimble was merely to restrain the sale and the original order has been modified to this effect by the Wayne county court.

CANADIAN CENSUS FIGURES

Montreal, Oct. 11—The census reports of manufactures taken in 1911 for the calendar year 1910 are now compiled. Compared with the census of 1901 for the year 1910 they show an increase in the 10 years of 4,559 in the number of working establishments, of $798,829,009 in the value of capital, of 175,108 in the number of persons employed, of $127,274,301 in the earnings of salaries and wages and of $683,[illegible],157 in the value of products. The statistics of establishments for the year 1910 are given in the report. The number of industries is 300 as compared with 274 in 1905 and 264 in 1900.

Rambler Dealers Report on Outlook

Statistical Analysis on Business Compiled by Jeffery Company

KENOSHA, Wis., Oct. 14—Four hundred and fifty Rambler dealers, in as many sections of the United States, have contributed to an important statistical analysis of business conditions just compiled by the Thomas B. Jeffery Co. in connection with their sales plans for 1913.

From every section of the country have come reports regarding crop conditions, the business outlook and the general situation of the money market.

The present healthy condition of the industrial, agricultural and money markets was anticipated by officials of the Jeffery company before the first 1913 Cross-Country was ready for shipment. As a result of this analysis the company last week was able to make to its salesmen and dealers a formal statement in which it was pointed out that contracts closed to date cover 40 per cent more cars than were sold during all of last year—this without any allowance for sales through the branches.

G. M. Berry, secretary of the company, now is on a tour of inspection of the New England states. G. H. Cox and E. S. Jordan, also officials of the company, have completed similar investigations. Mr. Cox has traversed the central western and southwestern states, including Iowa, Kansas, Nebraska, Missouri, Oklahoma and Texas. The central states including Illinois, Wisconsin and Indiana, have been covered by Mr. Jordan.

Not satisfied with superficial reports and hearsay information these men themselves have gone to the farmer; they have plied him with questions, they have looked over his crops, they have gone to town and talked to his banker, they have interviewed the merchant who sells him his household supplies; they have inspected the grain elevators and they have gotten from the railroad freight traffic managers a fund of information regarding the shipment of cars.

From P. J. Downes, who represents the Jeffery company in Minnesota and the northwest, comes the statement that not in recent years has the crop yield in Minnesota, North Dakota, South Dakota and Montana been so promising. To this is added the report of investigations by G. G. Muma, representative of the Jeffery company in northwest Canada. With the exception of a few isolated sections, crop conditions in Canada are declared by dealers with whom Mr. Muma comes in contact to be almost equal to conditions in the northwestern states.

Information received from L. H. Bill, representative for the Jeffery company in San Francisco and on the Pacific coast, is that while the fruit crop is small, general industrial conditions including building never before were brighter.

The agricultural outlook in Texas, Louisiana and Florida, Jeffery dealers declare, indicates large sales of cars during the next 8 months.

The general condition of the central states as summed up in the reports submitted by dealers is best reflected in Iowa. The total production from the fields of this state alone will amount to $402,000,000.

Throughout the east and in the manufacturing centers of New England business conditions are keeping pace with those in the west. The Thomas B. Jeffery Co. has had its finger on the financial and industrial pulse of this section as it has upon the pulse of every section of the country from Maine to California and from Texas to northern Canada. If this is to be a bumper year in corn and wheat it is also to be a bumper year in motor car sales.

PECULIAR WINDSHIELD RULING

Washington, D. C., Oct. 12—A peculiar ruling has been made by Judge Pugh, sitting in the police court, to the effect that a motorist is guilty of criminal negligence who drives with the windshield of his car up or in use through the streets at night when it is raining. The defendant was Robert Parrott, a business man, who was charged with colliding with Harold Durnell. "Motorists should be willing to take a few rain drops to avoid accidents," said Judge Pugh, who is himself a motorist. "I know no man can see through the glass of a windshield on a rainy night if the glass gets wet. I drive a car myself and know whereof I speak. Windshields are to shield the wind and not the rain."

STREET CAR LAW AMENDED

Chicago, Oct. 14—The local ordinance which prohibits motor cars passing street cars which have stopped at crossings to take on or let off passengers has been modified by the city council which has just amended the regulations so as to include all vehicles. A test case had been threatened by motorists who claimed class legislation, and the city fathers, rather than risk having the law wiped off the books, made the change which, it is thought, will make the clause iron-clad.

The city ordinances are coming in for considerable attention of late. Only recently Judge Freeman of the municipal court handed down a decision holding invalid the ordinances prohibiting motor cars smoking, holding that the city had no authority to pass this ordinance because the motor act passed by the last legislature took away from the city the right to regulate motor cars and that the state law superseded the city ordinance. Since that decision the city has not brought any of the smoke cases to trial. An appeal will be taken, as it is held the smoke ordinance is a traffic regulation and being so it is within the province of the city to pass such a law.

A bill now before the judiciary committee would compel owners of cars fitted with self-starters to further equip them with locks so the motors cannot be started by small boys or mischievious persons. Another bill calls for fenders being fitted to all motor cars.

TRUCK CLUB ON COAST

Los Angeles, Cal., Oct. 12—An enthusiastic meeting of the motor truck owners and dealers of Los Angeles was held recently at the rooms of the Automobile Club of Southern California, at which time the Motor Truck Club of California was organized with W. T. Wood as president and George H. Harrison as secretary and treasurer. Mat Moreland was elected chairman of the legislative committee and D. L. Whitford was appointed chairman of the membership and finance committee. The motor truck road to the harbor will be one of the features to be urged by the new organization and the legislative committee will take up all forms of proposed motor truck legislation with the city fathers.

NEW SIGNAL LAW FOR CINCINNATI

Cincinnati, O., Oct. 15—Up to September 23, motorists in Cincinnati have been prohibited by law from using any other form of signalling device than the bulb and reed horn. Following an investigation into the cause of an increasing number of street accidents, the council came to the conclusion that the inadequate warning of the bulb horn was largely responsible for a great proportion of the street fatalities in which motor cars were concerned. On September 23, accordingly, the bulb-horn ordinance, which had been in force since December 14, 1903, was repealed, and a new one enacted. This new ordinance is more than an amendment, as it differs radically from its predecessor. It reads as follows:

Section 850. Every motor vehicle or motorcycle while being used upon the streets of this city shall be provided with a suitable bell, horn or other signal device, and it shall be unlawful for any person to use any device which will not produce an abrupt sound sufficiently loud to serve as an adequate warning of danger, and it shall be unlawful for any person to make or cause to be made any unnecessary noise with any such bell, horn or signal device, or to use the same except as a warning of danger. Automobiles, motorcycles and other self-propelled vehicles shall not emit unnecessary smoke.

The new ordinance closely resembles those recently passed in Chicago, St. Louis and Newark, and indicates a progressive trend in motor car legislation in this regard at least.

The Readers

High Compression Status

Disadvantages Outweigh Advantages of High-Pressure Motors at Present Time

ST. LOUIS, Mo.—Editor Motor Age—Will Motor Age explain why motor car builders keep the engine compression so low. I have always thought that the higher the compression the greater the explosive power. Am I wrong?—E. Rozier.

The compression of motor car motors is kept below a certain maximum mainly because of the difficulty of cooling and lubricating a high-compression motor, and because of the added weight necessary to withstand the greater internal pressure of a motor of this type. There can be no doubt that an increase of compression means an increase of combustion pressure in a gasoline motor, but it is also to be remembered that increased heat in the combustion chamber makes lubrication very difficult, and with an explosive charge of equal volume at atmospheric pressure, the heat generated in combustion is increased in intensity four fold with a compression of one volume. Thus in a 4 by 4-inch motor, if the normal compression at the top of the stroke is 50 pounds, a decrease of compression volume of 50 per cent, see Figs. 1 and 2, means an increase of compression of 100 per cent or making the total compression 100 pounds. The increase of heat of 100 per cent makes the need for oil twice as urgent so that the same amount used at 50 pounds, if used at 100 pounds is only half enough, and so it is burned twice as fast because of the doubling of the heat. The result is that a decrease of compression volume of 50 per cent involves a loss of 75 per cent of

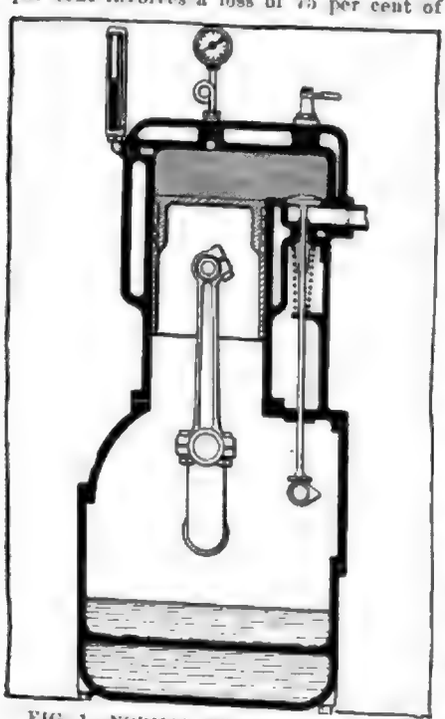


FIG. 1—NORMAL TEMPERATURE AND COMPRESSION

Cooling and Oiling Troubles Against the Development of High-Pressure Motors—Engineer Advances Opinions on Crankshaft Design

lubrication. Not only this, but the increase of heat makes cooling four times more difficult, because the area of the walls of the combustion chamber is decreased ½, while the heat to which they are subjected is increased two fold. Thus it is seen that to provide an adequate lubricating means, the volume of oil must be increased 150 per cent, with the same form of jackets, the water circulation must be increased 100 per cent in speed, or with the same speed of circulation, 100 per cent in volume, and 100 per cent more radiation surface must be provided. The weight of the motor will be greatly increased, as the strength of the parts must be increased 100 per cent.

The objections to high compression do not end here, even, as with the higher compression in the cylinder, spark timing becomes extremely difficult, preignition being a strong tendency, and the seriousness of carbon deposit in this connection is increased four-fold. In electrical ignition, the current tension must be increased 100 per cent to resist the corresponding resistance at the sparking points of increased pressure. This increased spark intensity means that the sparking points come in for more rigorous service requirements, and must be made larger in size and of a material capable of withstanding the greater heat of the spark.

Another point of utmost importance is in starting difficulties. To turn over a high-compression motor, additional mechanical appliances must be provided to overcome the compression, electrical starters would have to be twice as powerful as at present, which involves grave difficulties. Compressed air starters would require a volume and pressure of air that would cause them to be extremely bulky, heavy, and even dangerous. Spring starters would be out of the question, and the danger of gas starters would be greatly enhanced by the high compression; and the shock of the explosion at such high pressures on the stationary pistons would probably be too much for the strength of any motor light enough to be at all practical for motor cars.

Another drawback of great severity is the expansion and contraction of metals. The great heat within the cylinder contrasted with the reduced heat on its exterior would involve terrific internal strains on even an externally machined and ground cylinder of annealed steel, and valves of any description would have their present tendency to warp increased to such an extent that valve trouble would be found one of the most [illegible] with such an engine. The expansion and contraction of the piston would be so great as to involve variances of piston pressure which would present almost insurmountable obstacles to proper lubrication.

In spite of all these difficulties, however, designers, from time to time have been inspired to attempt the solution of the problems involved, using oftimes machined individual cylinders, with external waterjackets, water-cooled pistons, valves in the piston, distribution of the charge by fuel injection, and vapor cooling arrangements. This subject is being widely agitated in France, where, in search of high-efficiency with light weight and simplicity, designers have experienced encouraging results in the development of long-stroke, small bore, moderately high-compression motors. This seems to indicate that the high-compression problem is not unsolvable, and that it is certainly an end worthy to be striven for. It is believed by some that the motor millennium will witness the perfection of a motor with this principle developed, and

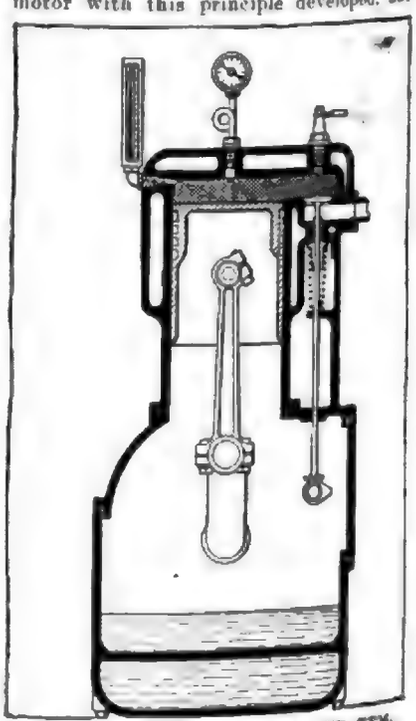


FIG. 2—HIGH COMPRESSION AND TEMPERATURE

Clearing House

Motor Misses When Spark is Advanced—Adams-Farwell is Last of the Mohicans—Cole Electric System Illustrated for Buckeye Reader

that designers are only confessing a weakness in adhering to the low-compression type, which is so responsive to development; but whose scope of efficiency is so limited. Others contend, to the contrary, that high compression is a feature that is meritorious in theory alone.

REVOLVING CYLINDER MOTORS

Pine City, Minn.—Editor Motor Age—What is the reason revolving cylinder motors are not used in motor cars? Is any one holding patents so as to prevent anyone from using them, or are they not a success?—E. W. Splittstoser.

Motors of this type have been tried out in motor car practice, but were abandoned after short experience. The Adams-Farwell car of Dubuque, Ia., uses a motor of this type, and is probably the only car manufactured using a revolving cylinder motor. This type of motor is not convenient for motor car work because of the great space it occupies, the fact that it is inaccessible for adjustment when running, and the gyroscopic action which it exerts, and which affects the steering and is apt to cause serious skidding. Their only use to any extent at the present time is in aeronautical work.

WANTS TWO-CYCLE EXPERIENCE

Grinnell, Kan.—Editor Motor Age—I have been reading with considerable interest the argument presented through Motor Age by a few men, as to the relative merits of the two and four-cycle motor car engines. While I know nothing of the two-cycle engine so far as personal experience is concerned, I do claim to know considerable of the shortcomings of the four-cycle engines, as I have run a motor car with a four-cycle, four-cylinder engine upwards of 13,000 miles. I have had very nearly all kinds of trouble known to four-cycle engines and it is my opinion that a two-cycle engine is superior to a four-cycle engine, providing a person gets a two-cycle engine without crankcase compression.

Agents or dealers handling the four-cycle machines will not give a person an answer as to why the four-cycle machine is superior to the two-cycle. They simply say that all manufacturers, with a few exceptions, make the four-cycle, consequently, they are superior to the two. To some of the people, I presume that an answer of this description is all that is necessary, but it will take considerable argument to convince me that the two-cycle machine is inferior. I would be pleased to have the owners of two-cycle cars give me their experience with their machines and also answer the following questions:

1—Does the engine clean readily running at high speed?

2—Are the engines bothered with overheating when working hard?

3—Does carbon or other deposit bother in the cylinders so that the engine has to be taken down every 500 miles and cleaned?

4—Will a 30-horsepower, two-cycle engine use much more gasoline than a four-cycle engine in the same conditions?

5—I have been told that the gasoline and gas coming in contact with the lubricating oil in the cylinders will cut it so that it will not properly lubricate the cylinders. Is this so?

6—Another objection to them, I have been told, is that they are exceedingly hard to start in cold weather.

7—Are they as speedy as the four-cycle engines?—A Subscriber.

DELCO DIAGRAM DEMANDED

Cleveland, O.—Editor Motor Age—I am told that the Cole car for 1913 is to be equipped with the Delco electric lighting, starting, and ignition system. Is this true, and is the system used similar to the Cadillac? Please submit a diagram of the main circuits.—Buyer.

You are correctly informed. The system as used on the new Cole models is similar to the Cadillac system, but not identical. The wiring diagram is shown in Fig. 3 and was explained in detail in the description of the Cole cars for 1913 in Motor Age, September 19, 1912.

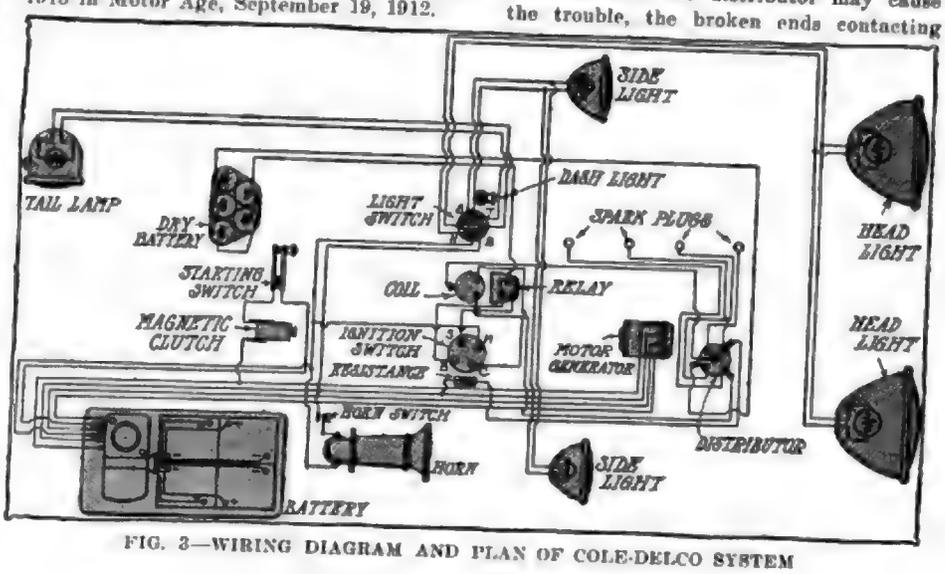


FIG. 3—WIRING DIAGRAM AND PLAN OF COLE-DELCO SYSTEM

Runs Only On Retard

Maxwell Motorist Finds that Magneto Does Not Work in Advanced Position

ALGOMA, Wis.—Editor Motor Age—We have a Maxwell, model Q 11, which will not fire under an advanced spark. The engine runs well on the battery and also on a retarded spark, but when the spark lever is moved to advanced position the motor dies. We suspect condenser trouble. What is the cause of the trouble?—Haney-Gasper-White Co.

Among the possibilities that may be eliminated as probabilities in this case is first of all the condenser. Trouble with this member, or any other coil part, except the vibrator, would result in a poor spark in any degree of advance, as the advance does not affect the strength of the current, so that condenser trouble would make itself manifest at all degrees of advance.

Since you say that the motor runs well on the battery, and interpreting this to mean in advanced position, the trouble must lie in the magneto circuit, and cannot be the result of carbureter trouble, which would affect the battery ignition and magneto alike. The magneto must be in generally good condition, or it would not produce a good spark in retard. You do not state the make of magneto, so it is hard to say whether or not the trouble is in the circuit-breaker.

It often happens, however, that with some makes of magnetos worn platinum points will contact on time in retarded position, but late or not at all in advanced position, cutting into the circuit on the weak portion of the cycle, or not at all. Your magneto may be out of time, so your spark is too early, being in normally advanced position when the lever is set for retard, and advanced too far past dead center on the advanced position of the spark lever. This, however, would cause the motor to backfire in advanced position, and probably back-kick on being cranked. A broken connection at the distributor may cause the trouble, the broken ends contacting

when the distributor is turned to retard, but separating when moved out of this position.

Worn or fouled insulation on the distributor connection may produce a short-circuit or ground by being brought together in advance, but being separated on retard. It may be that your magneto is adjusted to produce too heavy a spark, that is excellent for starting, but has too much lag for advanced running. This is caused by over-induction, increasing the intensity, or voltage of the spark, but cutting down its speed or amperage. It may be possible that the starting button on the coil, if the latter is of such type, is in permanent contact, producing a starting, or too heavy a spark constantly, with the above results.

In case the condition, contrary to the wording of the query, obtains alike under either battery or magneto ignition, the cause may be any of the above in combination with stiff vibrator springs, which also produce a spark of excessively high-tension, or weak valve springs, which allow of the return of the valves to their seats at low speeds, but have not sufficient energy to seat them between turns of the cam at the higher speeds that result from an advanced spark. The trouble may also be a plain case of a poorly adjusted carbureter.

Your carbureter may feed too much gasoline for high speeds. Modern carbureters have different adjustments, viz.—for high speed, for low speed, and on some, for intermediate speeds. These should be thoroughly studied before attempting any actual adjustments, and then each adjustment made at the respective speed intended. An over-rich mixture will run the motor fairly well on low speeds, but will choke up the engine on high speeds. It will give very little power on any speed, and will overheat and carbonize the motor.

DESIGNING COMPRESSION CHAMBER

Eagle Lake, Tex.—Editor Motor Age—How large should be the compression chamber of a 4 by 4½-inch motor, of the L-type? I would like the measurement in cubic inches.—A. Hansel.

The compression space in the ordinary motor is about one-third of the piston displacement. The piston displacement of a 4 by 4½-inch cylinder is 56.52 cubic inches and the compression space should be one-third of that or 18.84 cubic inches.

If the valves are side by side, the valve pocket will be slightly greater in volume than if they are superimposed, and hence the height of the compression space must be correspondingly less.

Balancing of Crankshafts

Centrifugal Force Exerts an Influence in Causing Motor to Rock, It Is Contended

DETROIT, Mich.—Editor Motor Age—Referring to Motor Age's answer to the questions of one of its subscribers on page 29 of the October 3 number, relating to a special crank arrangement for a four-cylinder four-cycle engine, I would like to correct some of the statements.

Motor Age explains that the subscriber's proposed crank arrangement, which has 180 degrees between each succeeding crank, is not practical because it would result in a bad balance, due to the necessary firing order. The two subsequent explosions of numbers 1 and 2 and numbers 3 and 4 cranks would cause the motor to vibrate, as the explosions are not evenly distributed along the crankshaft, but always occur at the same end of the motor. I cannot agree with this statement and do

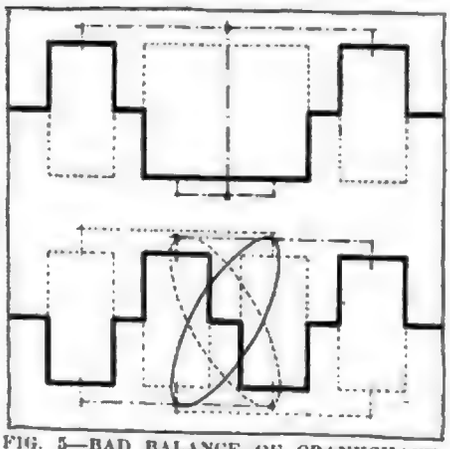


FIG. 5—BAD BALANCE OF CRANKSHAFT WITH ALTERNATE THROWS

not believe that the motor will vibrate more on account of the firing order than otherwise, as you also state the same thing about a six-cylinder motor where the firing order 1-2-3-6-5-4 shows no increase of vibration over one wherein the firing order is broken up and distributed, as in the sequence 1-4-3-6-3-5, along the crankshaft.

The unbalance of the engine with the suggested 1-2-3-4 firing order is due to the necessary crank arrangement which results in a much poorer balance than the regular four-cylinder four-cycle crank arrangement. It is well known that the four-cylinder two-cycle engine is more poorly balanced than the same size four-cycle engine, due to its peculiar crank arrangement, and this suggested crankshaft for four-cycle engines would vibrate about twice as much. The two above-mentioned six-cylinder arrangements use the same crankshaft and therefore there is no difference in vibration due to crank arrangement, and as experience shows, the firing order does not influence the balance. In the four-cylinder arrangement suggested by your subscriber, the crankshaft has to differ from the one used regularly on four-cycle four-cylinder engines, and, as stated above, it is very much out of balance. Therefore I do not agree with your assumption that now, when the component parts of the motor are better balanced than some years ago, some makers will adopt this type of crankshaft—Ernest R. Fried, research engineer, General Motors Co.

Interpreting this criticism as implying that the differing paths of centrifugal throw, as shown in Fig. 5, are more responsible for poor engine balance with the type of crankshaft shown than the tetter ing effect of the undistributed firing order, Motor Age must inquire of Mr. Fried by what process of calculation he concludes that the centrifugal force of the cranks is a more powerful influence against proper balance than, say, a 20-horsepower blow upon the crankshaft alternately at opposite ends on each engine cycle. That a 125-pound crankshaft in improper centrifugal balance would exert a more destructive vibratory influence than improper application of the full power of, for instance, a 40-horsepower engine, seems a trifle odd.

Again, in regard to the balance of a four-cylinder two-cycle motor. Motors of this type, when properly designed, have the established reputation of being greatly superior in running balance to four-cycle motors, due to the fact that there are four separate impulses on each revolution of the crankshaft, instead of but two, as with the four-cycle type. As to using a four-cylinder two-cycle crankshaft in a four-cylinder four-cycle motor, Mr. Fried must understand that such a thing has never been contemplated, because of the four cycle action. If so used, it would be found that instead of the explosions occurring in the sequence shown at the top, Fig. 4, they would occur as at the bottom, resembling a lope, which of course would destroy all running balance, in the same manner as the balance of a two-cylinder opposed motor is destroyed if the same crank is used for both cylinders, as in Fig. 7.

In regard to the observation concerning six-cylinder motors, the statement regarding crank angles is right, but this example was taken from the observations of a prominent manufacturer on this subject, to illustrate his opinion that unbalanced firing orders had no effect on a perfectly balanced six-cylinder motor and made no reference to crank angles.

In fairness to Mr. Fried, it must be admitted that a crankshaft like the lower, Fig. 5, is very much out of running balance at high speed, due to the wavering lines of the path of centrifugal throw.

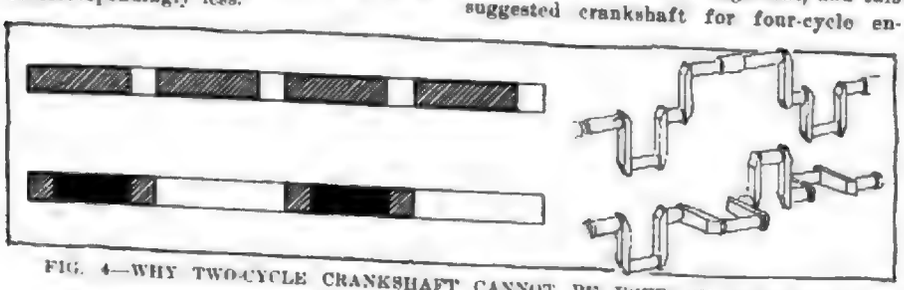


FIG. 4—WHY TWO-CYCLE CRANKSHAFT CANNOT BE USED ON FOUR-CYCLE

Fig. 5 explains this difference. The center of centrifugal thrust, of the respective throws, as shown by the brackets, coincide in a standard crankshaft. With an alternate-throw type they do not; hence the center of thrust on a given side varies as shown by the ellipes.

This, however, is not, in the estimation of Motor Age, to be compared to the effect in this direction of first subjecting one end of the crankshaft to a downward strain of one-half the total power of the engine, and then the other end with a similar strain.

ANTI-FREEZE FOR GAS GENERATORS

Gaylord, Minn.—Editor Motor Age—1—How does one reset the season's mileage back to zero on a Stewart speedometer?

2—Is there any compound I could put in the radiator to prevent it from freezing? If so, what proportion?

3—Would the same compound answer for acetylene gas generators?

4—Would benzine, if fed to a motor, give as much power as gasoline. What effect would it have on the motor?—A Reader.

1—There is no provision for this, and the machine must be returned to the factory to be reset. Turning it backward will only add in the same manner as going forward.

2—The best solution to prevent the water in the radiator from freezing is a mixture of alcohol and water. The proportions for various temperatures that have been found most satisfactory are given below:

For 5 gallons of solution:

Degrees Fahr.	Ingredient.	Gallons	Quarts	Pints
15	Water	4	..	..
	Alcohol	..	2	..
	Glycerine		2	..
8	Water	3	3	..
	Alcohol	..	2	1
	Glycerine		2	1
-10	Water	3	..	1
	Alcohol	1	1	..
	Glycerine		2	1
-20	Water	1	1	..
	Alcohol	2	2	..
	Glycerine ..	1	1	..

3—For this use plain alcohol is advisable in the proportions given below. Alcohol is a fuel, but not explosive. It will therefore probably give a slightly stronger gas than water, and for this reason less will be required. Do not use glycerine, as this is an explosive.

Percentage of alcohol in water:

At 18 degrees.....10 per cent
At 5 degrees.....20 per cent
At -2 degrees.....25 per cent
At -9 degrees.....30 per cent
At -15 degrees.....35 per cent
At -24 degrees.....40 per cent

4—Benzine has been found an ideal motor fuel in all respects except that starting in cold weather is sometimes difficult. The use of benzine requires the most advanced forms of carbureters, preferably water-jacketed, and using warm air. In cold weather, it is advisable to use gasoline for starting, changing to benzine when the motor is warmed. It has been found to produce, under proper conditions, greater mileage per gallon than gasoline.

Timer Overheating Cause

Reader Gives Experience on Cooling With Mitchell that Overheated Badly

CINCINNATI, O.—Editor Motor Age—Having obtained considerable information from these columns, I feel that a recent experience of mine may not be amiss and may aid some mystified and inquiring reader.

Some time ago I noticed that the water in the radiator of my Mitchell touring car heated and boiled on the slightest provocation, and that on some grades, even when running on high, the water would boil and the engine get hot so that

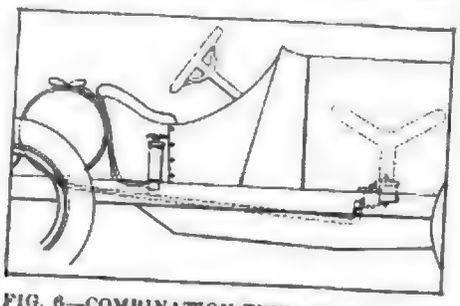


FIG. 6—COMBINATION FEED ON FIAT CAR

I would have to stop and cool it off and refill with cool water. I had the circulation examined even to dismantling the pump, but could not find the trouble.

One day I noticed that the lever regulating the timer seemed to fly back of its own accord, and, upon investigation, found, first, that the timer in some manner had become jammed and would not work either way; second, that the rod running along the steering post had on it at the lower end a set screw, which had become loosened and with the result that when I threw the lever to advance the spark, the set screw being lose and timer jammed, nothing moved except the lever itself, with the result that the engine was running at all times on retarded spark, which was sufficient to cause it to heat. Thirty minutes' work taking off the timer, oiling it and tightening the set screw, set everything to working properly, and I have had no heating trouble since.

Another point which I have learned concerns the Splitdorf system of ignition. For some time I experienced considerable trouble and expense replacing dry cells, which, as soon as connected, seemed to run down very rapidly. After buying several sets of batteries, and trying a number of experiments by packing in asbestos and other insulators, I was informed by one of the trouble men that almost every Splitdorf coil had some leakage and that by installing on the dash—a place handy to the driver—between the coil and dry cells a double-knife switch, whereby, as soon as the car was cranked and the regular switch thrown to the magneto, then the knife switch could be thrown, cutting out the dry cells, the leakage would stop, and my troubles ended. I installed the switch as directed, and my last set of batteries have lasted over 6 months.—W. J. Carey.

SUGGESTS FRICTION DRIVE

Jacksonville, Fla.—Editor Motor Age—As a subscriber to and constant reader of Motor Age, I have been much interested in the discussion of the gear-change question, which has for some weeks past appeared in these columns and anent which some very able arguments have been contributed for and against the four-speed gear-set.

From these articles, as well as from personal observation, I gather that there is no little abuse of the motor, when hard pulls are encountered, through the disinclination of the operator to change speed ratio, either from what may be justly termed pure laziness, or from the other consideration that gear ratios are not suited to the conditions of the pull; being too low,—allowing the motor to race, with its very unpleasant vibration, noise and tendency to overheat—or too high, dragging the motor unduly, the injurious effects of which are undisputed.

It has occurred to me that these earnest gentlemen are—in their search for improved conditions in this matter—overlooking, although putting up a rather strong argument for the much despised friction transmission, in which type there is an unlimited number of speed ratios, from which the operator may select such one as the conditions, his experience or his inclinations may dictate and to which he may resort instantly, with a minimum of effort, without changing throttle or rating his motor, and, what is of further advantage, without losing anything from the momentum which his car has when change is made.

I am not a dealer in cars of any type, but have had ample experience with both geared and friction transmission, and cannot forbear offering the above suggestion, at this time, when the discussions appearing makes it opportune.—J. N. Merrill.

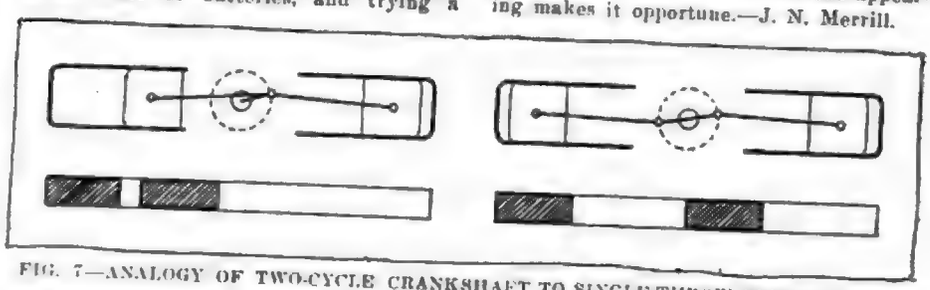


FIG. 7—ANALOGY OF TWO-CYCLE CRANKSHAFT TO SINGLE-THROW OPPOSED TYPE

| | | |


A Warning to Automobile Drivers

¶ Keep a sharp lookout at crossings.

¶ Approach car tracks slowly, with your machine under control.

¶ Don't cross the car track behind a street car; you may run into a car on the other track, coming towards you.

¶ Don't turn into a car track in front of a moving car; you run the risk of collision.

¶ Automobile accidents are increasing to an alarming extent. Collisions with street cars are frequent. Something must be done to stop these collisions. The way to stop them is by more careful driving on and near car tracks.

¶ To this end automobile drivers are earnestly urged to co-operate with this company.

The Milwaukee Electric Railway and Light Company

From the

TO reduce the number of accidents due to collisions between street cars and motor cars in Milwaukee, the Milwaukee Electric Railway and Light Co. is using large display space in the local daily newspapers warning drivers as well as passengers to use and induce care and caution. The advertising, while unique as concerns the use of motor cars, is in line with the policy of the traction company to encourage public safety by means of newspaper publicity. The campaign of warning to motorists was carried on heaviest during the period of the Vanderbilt cup races, when thousands of outside motorists brought their cars to Milwaukee. The principal advertisements were as follows:

"A WARNING TO AUTOMOBILE DRIVERS.—Keep a sharp lookout at crossings. Approach car tracks slowly, with your machine under control. Don't cross the car track behind a street car; you may run into a car on the other track, coming towards you. Don't turn into a car track in front of a moving car; you

SCARED Into Paying Fees—Despite the suit which is pending in the supreme court of Mississippi in regard to the constitutionality of the new state motor law, the license tax has been paid on 2,712 cars. The suit will be heard in December.

Motor Car Post Established—In the outlying districts of Istria, Austria, has been established a motor car post service which is proving very popular and takes the place of the horse diligence service, which was carried on over those excellent post roads years ago.

Minneapolis Wants Wheel Tax—Advice of the city attorney has been asked by the Minneapolis common council as to a motor vehicle wheel tax, the proceeds to be utilized in repairing streets. The attorney is asked to decide if it is without authority to make such a tax whether a law granting such authority can be passed and sustained.

Ohio Owns Many Cars—Statistics compiled by Registrar Shearer of the state motor car department at Columbus, O., show that one out of seventy-seven persons in the state own cars. This places the average ownership in this state far above the average, as federal statistics show that one car is owned by every 110 persons. Two states only show more owned than in Ohio—New York and Pennsylvania. More than 60,000 cars are owned in Ohio.

American Cars in Australia—American motor cars to the value of $443,992 were imported in 1911 into the Victorian consulate, which comprises the Australian states of Victoria, South Australia and western Australia. The motor car in this section is considered a matter of economy by the farmer, so much so that a local publication says, "The farmer without a car can no longer compete with the farmer with one." Following up the subject, and advising how Americans can secure more of this business, the Daily Consular and Trade Reports of September 24 says: "It can best be done by sending out more salesmen than has been the custom. An energetic salesman can do more business in a week than can be done by correspondence in 6 months. This consulate has yet to learn of an American drummer who has gone away from Australia dissatisfied with the volume of business transacted."

Popular Road Opened—The Automobile Club of Syracuse announces that the Camillus-Elbridge state road is open, which means that a continuous stretch of state highway now extends from West Camillus hill to Auburn, N. Y. Portions of the road have been closed all summer, necessitating detours.

Hoosiers Hold Election—Officers have been elected for the Hoosier Motor Club of Indianapolis for the ensuing year as follows: James L. Gavin, president; F. I. Willis, first vice-president; Dr. A. C. Kimberlin, second vice-president; P. C. Rubush, third vice-president; Joseph R. Raub, treasurer, and W. S. Gilbreath, secretary. George Ade, the humorist, and Harold Taylor have been elected honorary members of the club.

Alabama Uses Negro Chauffeurs—Only 36 per cent of the licensed drivers in Alabama are white. This is the result of the lower wage for which they will accept the service. The average age of chauffeurs is 22 years, only two men in the state having licenses who are over 30 years of age. The average height among the 3,224 men holding licenses is 5 feet 9 inches. The average weight is 160 pounds. In order to enforce the state motor tax more thoroughly this year every police officer has been made a deputy collector of car licenses.

Motor Facts from Brazil—In the city of Pernambuco, Brazil, are about 125 motor cars, the major portion of them the property of five garages, only forty being owned by private citizens. They have almost entirely superseded horsedrawn vehicles for pleasure use, although service is strenuous for them on account of the cobblestones with which the streets are paved. A set of tires on the public motor cars, which are from 16 to 40 horsepower, lasts about 22 days, and gasoline is about 30 cents a gallon. The charge for rental of these cars is $3 American money for the first ½ hour and $2 for each succeeding ½ hour. Among the pleasure cars in use are the Ford, Daimler, Delahaye, Duryea and Renault, while the few trucks used are of German manufacture. Duty amounts to about 16 per cent ad valorem. A medium priced, very strongly built car, with serviceable hood for protection against heavy rains as well as the sun, is mostly in demand.

Rockingham Meet Postponed—The motor car and motor cycle races which were to be held at Rockingham Park, Salem, N. H. October 12, have been postponed for a week because the rain of the past few days softened up the track so that it would be dangerous, so the A. A. A. officials and the management decided not to try to run them off. These events will bring the racing season in the east to a close.

Road Meeting in Alabama—With the assembling of over 1,000 delegates in Birmingham, Ala., last week at the state good roads convention, the state claims to be first in the south in good roads activity. W. W. Finley, president of the Southern Railway, was the principal speaker. John Craft, president of the Alabama Good Roads Association, just having returned from the American Road Congress at Atlantic City, pointed out the lessons of that gathering to the assembled delegates.

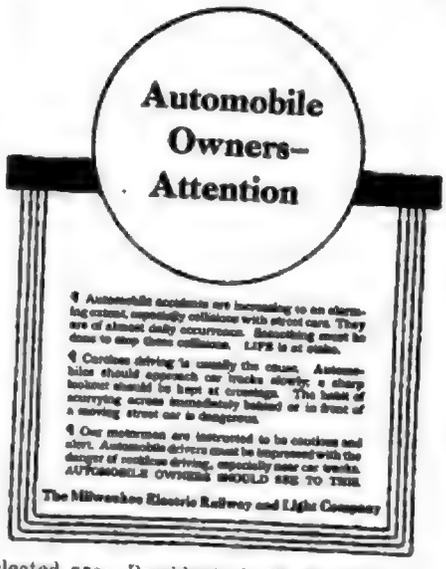
Shell Road to Be Restored—The shell road around Mobile bay, the most famous driveway in Alabama, is to be restored. The roadway was destroyed by the storm of 1906, which resulted in the death of fifty-five persons. The city and county have agreed upon the terms for the reconstruction of the road due to the activity of the car dealers in getting them together in an agreement as to the proportionate charges. The city will pay one-third of the expense of the reconstruction and the county the remainder.

Where Cars Are Plentiful—It is claimed that no community in the United States has a greater number of motor cars for its population than San Benito and the immediate adjoining section, embracing about 25,000 acres of cultivated land. The population of San Benito is little more than 3,000 and the number of cars owned by the people there and by the farmers of the surrounding section is 127. It is announced that orders have been placed for forty additional motor cars to be delivered before the first of next March, making a total of 167 that will then be in use. What makes

Four Winds

run the risk of a collision. Automobile accidents are increasing to an alarming extent. Collisions with street cars are frequent. Something must be done to stop these collisions. The way to stop them is by more careful driving on and near car tracks. To this end automobile drivers are earnestly urged to co-operate with this company."

"Automobile accidents are increasing to an alarming extent, especially collisions with street cars. They are of almost daily occurrence. Something must be done to stop these collisions. Life is at stake. Careless driving is usually the cause. Automobiles should approach car tracks slowly; a sharp lookout should be kept at crossings. The habit of scurrying across immediately behind or in front of a moving street car is dangerous. Our motormen are instructed to be cautious and alert. Automobile drivers must be impressed with the danger of reckless driving, especially near car tracks. Automobile owners should see to this."



the large number of cars that are owned there all the more remarkable is the fact that 5 years ago the site of the town, as well as the farms embraced in the 25,000 acres, were covered by a wilderness of chapparal with not an inhabitant thereon.

Alabama Makes Money—With the completion of Alabama's fiscal year, October 1, it is found that $64,489 was paid into the state treasury for motor car licenses. The expense of operating the department was $9,673.35. About half of the remainder, $24,434.90, was devoted to the improvement of roads.

Montreal Show Growing—The management of the Montreal show, which is to be held from January 4 to 11, under the auspices of the Automobile Club of Canada, has received so many applications for space that it has been obliged to secure a second building for overflow exhibit, the Sixty-fifth armories, in addition to the large drill hall in Craig street. At a recent meeting of the Automobile Section of the Canadian Manufacturers' Association it was decided to sanction only three national shows in Canada, at which members of the association will exhibit, these being Toronto, Montreal and Winnipeg. The Montreal show is being managed by E. M. Wilcox, 123 Bay street, Toronto.

Taft's Motor Tour—President William H. Taft got a very good idea of the splendid roads in New England last week when he made a swing through Massachusetts, Vermont, Maine and New Hampshire, accompanied by Mrs. Taft, the secret service men and a party of Washington newspaper men in three six-cylinder Pierce-Arrow cars. Through western Massachusetts he swung up to Vermont and then across New Hampshire to Bretton Woods, going from there down again, touching the edge of Maine and back to Beverly. He made a daily average of more than 150 miles, and when it is considered that he had to make several stops each day for speeches, and the party carried an immense amount of baggage, the tour was a strenuous one. At Bretton Woods he told Manager W. S. Kenney, of the Mt. Washington hotel, that he was surprised at the splendid condition of the highways in the mountains and that he never enjoyed a better day's ride than in winding through the woods and mountains with each turn presenting a newer and glorious picture formed by the autumn foliage together with a delightfully bracing air. He said for real pleasure a mountain tour in October through the White mountains could not be excelled.

New Boulevard Opened—The Buffalo-Niagara Falls boulevard, which the Buffalo Automobile Club was instrumental in constructing, will be officially opened for traffic November 15. Sixteen feet of the road is of brick and 16 of improved earth road, the boulevard being 32 feet wide along the entire course.

Belgium Plans Road Race—It is reported from Belgium that next year's Ostend meeting will be given a considerable extension and will comprise a long-distance grand prix road race, distance probably 400 miles, in which cash prizes of $8,000, $4,000 and $2,000 will be offered. The Royal Automobile Club of Belgium will have charge of the race, the date of which will doubtless be in the middle of June. The course has not been decided on, but probably will be in the Belgian Ardennes.

Drake on Another Tour—Joseph R. Drake, who made one tour around the world in the little Hupmobile, has gone on a second and more comprehensive journey around the globe. While the trip has an aspect of pleasure it is also for business. On his former trip Mr. Drake started westward, on the present trip he will sail from New York to England and after touring England and Scotland he will visit the Olympia show, London, and then tour the principal cities of Europe. From Europe the trip will be continued by boat to India, then to China, Japan, the Philippines, Australia and New Zealand.

Want Road to Park—An association has been formed at Lemmon, S. D., to promote construction of a highway from the Twin cities to Yellowstone park, a continuation of the Parmley road, which is being built from Aberdeen to Mobridge. It is said that in the past season more than 20,000 cars visited the park, and that all but 110 went by the northern route through North Dakota because of better roads. The more direct route is said to be through Aberdeen, S. D., Mobridge and Lemmon, and Miles City and Billings, Mont. Officers elected are: President, J. W. Parmly, Ipswich; vice-presidents, J. E. Pringle, Ismay, Mont.; J. E. Philan, Bowman, N. D.; secretary-treasurer, F. A. Finch, Lemmon.

State Engineer for Louisiana—Owing to the large amount of good roads construction now in progress in Louisiana a state highway engineer has been appointed, who will be at the service of all parishes to indicate proper methods of road construction and to see that roads once built are properly protected. W. E. Atkinson, of Monroe, has been appointed to the new position. He is a graduate civil engineer who has been in charge of much road construction in Louisiana.

Mileage of City Cars—An interesting report of the mileage of motor cars used in the Indianapolis police department, during 1911, has just been filed with the board of public safety by Martin J. Hyland, chief of police. The two Packard patrol wagons covered 23,868 miles in 7,249 runs, carrying 9,139 prisoners to the police headquarters, 1,804 prisoners to the workhouse and 165 prisoners to the woman's prison. The Premier touring car used for emergency runs made 1,978 runs, carrying 401 prisoners and making a total of 12,542.1 miles. The total cost of gasoline, oil and maintaining the three machines, exclusive of the drivers' salaries, was $3,927.60, it is announced by the board of public safety.

Importers Announce Salon—As has been the case for several years past, the 1913 show season will be inaugurated by the annual salon of imported cars, held in New York. The dates for the coming salon are January 2 to 11, and it will again be staged in the ball room of the Hotel Astor, New York city. With one or two exceptions all of the foreign makes represented in this country will participate in this season's salon. Among those who have already arranged to have Paris exhibits shipped to this country are de Dion-Bouton, Isotta-Fraschini, Lancia, Mercedes, Metallurgique, Minerva, Panhard and Renault. This list represents five nations, France, Germany, England, Italy and Belgium.

Brief Business Announcements

Recent Agencies Appointed by Car and Truck Manufacturers

PLEASURE CARS

Town	Agent	Car
Amherst, Nebr.	Geo. Christofferson	Studebaker
Anaheim, Cal.	P. J. Weisel & Co.	Henderson
Arapahoe, Nebr.	A. Benjamin	Studebaker
Arlington, Nebr.	J. C. Blackburn	Studebaker
Blair, Nebr.	Warrick Auto Co.	Studebaker
Calvert, Tex.	Geo. T. Bergeron	Henderson
Columbus, Nebr.	Held Auto Co.	Studebaker
Columbus, O.	Broad-Oak Automobile Co.	Paige-Detroit
Cuyahoga Falls, O.	Falls Auto & Sales Co.	Henderson
Danville, Ill.	D. D. Snyder & Co.	Henderson
Fargo, N. D.	The Bergan Auto Co.	Henderson
Farragut, Ia.	Palm & Cutler	Apperson
Grand Rapids, Mich.	W. S. Farrant	Henderson
Green Bay, Wis.	Washington Garage	Mitchell
Green Bay, Wis.	Washington Garage	Little
Green Bay, Wis.	Washington Garage	Overland
Haines City, Fla.	Wynn W. Scott	Henderson
Hamilton, O.	Hamilton Motor Car Co.	Buick
Henderson, Nebr.	David Goertzen	Studebaker
Herman, Nebr.	Olson Auto Co.	Apperson
Ithaca, Nebr.	J. Knapp	Franklin
Kokomo, Ind.	James H. Carnelly	Studebaker
Lancaster, Pa.	Automobile & Supply Co.	Henderson
Lima, O.	Griffith Auto Sales & Supply Co.	Henderson
Lordsburg, Cal.	Williams Bros.	Henderson
Miami, Fla.	Chas. L. Wetzel	Henderson
Milwaukee, Wis.	F. O. Morse	Crawford
Minneapolis, Minn.	MacArthur-Zollars-Thompson Co.	Richmond
Monroe City, Mo.	Monroe City Auto Co.	Henderson
Montgomery, Ala.	Henry L. Hattemer	Henderson
North Platte, Nebr.	J. S. Davis Auto Co.	Franklin
New Orleans, La.	Myatt-Dick Motor Car Co.	Franklin
Oakland, Nebr.	Chas. E. Anderson	Studebaker
Malvern, Ia.	Robbins Auto Co.	Firestone-Columbus
Pacific Grove, Cal.	Herbert Nuttall	Henderson
Rock Rapids, Ia.	George H. Watson	Mitchell
St. Louis, Mo.	Bagnall Automobile Co.	Cole
Salisbury, Md.	Frank J. Adams	Henderson
San Jose, Cal.	J. Ramsellus	Henderson
Saranac Lake, N. Y.	H. J. Morse	Henderson
Stockton, Cal.	S. F. Ruff	Henderson
Ventura, Cal.	Wesley B Parker	Henderson
Walnut, Ia.	Cole & Hanson	Apperson
Washington, D. C.	Matheson Motor Co.	Premier
Washington, D. C.	Potomac Motor Car Co.	Marmon
Waynesboro, Ga.	R. C. Neely & Co.	Henderson
Wilkesbarre, Pa.	C. D. Hershberger	Henderson

TRUCKS

Towns—	Agent	Car
Albany, Ore.	Barrett Bros.	Federal
Anaheim, Cal.	P. J. Weisel & Co.	Federal
Auburn, Cal.	H. W. Davis	Federal
Austin, Tex.	Ben M. Barker	Federal
Bakersfield, Cal.	Ben L. Brundage	Federal
Boston, Mass.	Charles D. Daly	Federal
Boston, Mass.	C. E. Whitten	Atlantic
Central Village, Conn.	U. LaFrance	Federal
Cincinnati, O.	Cincinnati Motor Car Co.	Federal
Connellsville, Pa.	Connellsville Garage	Federal
Dallas, Tex.	Alamo Automobile Co.	Federal
Denver, Colo.	W. W. Barnett	Federal
Detroit, Mich.	Thompson Auto Co.	Federal
Evanston, Ill.	George C. Foster & Co.	Federal
Eugene, Ore.	J. S. Airheart	Federal
Fall River, Mass.	Robt. W. Powers	Federal
Fitchburg, Pa.	Fitchburg Hardware Co.	Federal
Ft. Wayne, Ind.	M. N. Plumadore	Federal
Fresno County	The C. W. Hobson Co.	Federal
Hamburg, N. Y.	D. W. Brodback	Federal
Hammond, Ind.	E. C. Minas & Co.	Federal
Hartford, Conn.	R. D. & C. O. Britton Co.	Federal
Hollywood, Cal.	J. E. Carroll	Federal
Houston, Tex.	Alamo Automobile Co.	Federal
Imperial, Cal.	Edgar Bros.	Federal
Jamestown, N. Y.	Edwin Wells	Federal
Lawrence, Mass.	Smith Bros.	Federal
Long Beach, Cal.	McKenzie & Bellows	Federal
Los Banos, Cal.	C. W. Hobson Co.	Federal
Minneapolis, Minn.	Pence Auto Co.	Federal
Newark, N. J.	B. F. Adams & Co.	Federal
New Haven, Conn.	Ailing Garage Co.	Federal
New Orleans, La.	Fairchild Auto Co.	Federal
Pasadena, Cal.	Munroe Motor Co.	Federal
Pendleton, Ore.	M. K. Long	Federal
Petaluma, Cal.	Jos. Peoples	Federal
Pittsburgh, Pa.	Union Motor Car Co.	Federal
Pomona, Cal.	Whip & Zander	Federal
Pueblo, Colo.	Ideal Motor Car Co.	Federal
Reno, Nev.	J. R. Wainwright	Federal
Richmond, Va.	Oakland Auto Co.	Federal
Rochester, N. Y.	J. Cunningham	Federal
Sacramento, Cal.	J. D. Lauppe	Federal
St. Charles, Ill.	C. S. McCornack	Federal
St. Paul, Minn.	Pence Auto Co.	Federal
Salem, Ore.	W. J. Pruitt	Federal
Salt Lake City, Utah	Cheeseman Auto Co.	Federal
San Antonio, Tex.	Alamo Automobile Co.	Federal
San Diego, Cal.	Hunt Auto Co.	Federal
Santa Ana, Cal.	T. W. Neely	Federal
Springfield, Mass.	W. H. Baxter	Federal
Stockton, Cal.	Sampson Iron Works	Federal
Syracuse, N. Y.	A. J. Jackson	Federal
Tacoma, Wash.	Pacific Car Co.	Federal
Taunton, Mass.	Brownell & Burt	Federal
Tillamook, Ore.	A. H. Harris	Federal
Traverse City, Mich.	Traverse City Iron Works	Federal
Vancouver, B. C.	H. J. Tucker	Federal
Ventura, Cal.	R. O. Dennison	Federal
Victoria, Tex.	Texas Motor Car & Supply Co.	Federal
Waco, Tex.	Percy Willis	Federal
Washington, D. C.	Louis Hartig	Federal
Watsonville, Cal.	H. G. Brewington Co.	Federal
Whittier, Cal.	Saunders Bros.	Federal
Wilmington, Del.	Pennsylvania Avenue Garage	Federal
Winnipeg, Can.	Boyce Carriage Co.	Lansden

HOUSTON, Tex.—The Essenkay Sales Co. has established a local office at 217 Carter building with H. H. Hassel manager.

Milwaukee, Wis.—The Auto Mart of Chicago has established a branch at Milwaukee, with headquarters at 301-303 Watkins building.

Lima, O.—J. J. Carson has purchased a lot in the center of the business district of Lima and will build a garage. The building will be of brick and concrete and will be 45 by 200 feet.

Boston, Mass.—Charles D. Daly, ex-fire commissioner of Boston, and former Harvard and West Point football coach, has gone into the motor industry, taking on the agency for the Atlantic truck. He has opened temporary offices in Postoffice square, but later on will get new salesrooms.

Montreal—Rosseau Brothers have incorporated themselves as a limited corporation. They are the Cadillac agents here.

Winnipeg, Can.—J. Mavor, lately distributing agent in western Canada for the Halladay, has given up this agency and opened a garage and repair shop in the western portion of the city.

San Antonio, Tex.—The Mathiesen Spring Cushion Wheel Co., which was recently organized with a capital stock of $60,000 will install a plant here for the manufacture of spring cushion wheels. The officers of the company are: C. W. Duhler, president; H. Matchiesen, vice-president, and H. A. Merucheau, secretary and treasurer.

Milwaukee, Wis.—F. O. Morse has established a salesroom, garage and repair shop at 386 Brady street and will be distributor for the Crawford.

Portland, Ore.—Having given up the agency for the Pathfinder and Paige cars, E. E. Gerlinger hereafter will devote his attention exclusively to the Warren and Stoddard-Dayton in Portland.

Los Angeles, Cal.—R. H. Morris, southern California manager of the Pioneer Automobile Co., Los Angeles representative of the Flanders electric, is now established in his new garage at 1236 South

Olive street. The Pioneer company now has sales houses in Sacramento, Oakland and Fresno.

Los Angeles, Cal.—H. G. Salisbury, for the past few months sales manager for the Pathfinder Motor Car Co. of Los Angeles, has been appointed general manager of the concern.

Milwaukee, Wis.—A $20,000 garage is being erected at North avenue and Thirty-second street, for Mohr Brothers, and will be ready for occupancy about January 1. The building is of reinforced concrete construction, 60 by 102 feet in size and two stories high.

Minneapolis, Minn.—The Frederick E. Murphy Automobile Co. has begun erection of a $140,000 structure for the Murphy line at Thirteenth street and Hennepin avenue, four stories, 137 by 144 feet. It will have one of the largest show rooms in the west.

Seattle, Wash.—W. C. Garbe, who assumed the management of the Seattle branch of the Studebaker Corporation last January, has resigned his post in favor of William J. Dunbar, of Portland, who has been with the Buick agency in the Rose City for several years.

Denver, Colo.—Three more car manufacturing concerns have just recently established state agencies in Denver. The Palmer & Singer Mfg. Co.'s line will be handled by W. W. Barnett. The Hall Automobile Co., which has just been organized by C. R. Hall, formerly of Chicago, will act as Colorado distributors for the Stutz cars. The Little Motor Car Co., of Flint, Mich., will be represented by the William Thorney Automobile Co.

Detroit, Mich.—Another building is to be constructed as an addition to their plant by the Long Mfg. Co., manufacturer of radiators. The size of the new structure has not been fully determined upon, but it is designed by this addition to secure sufficient space to enable the company to keep pace with a rapidly increasing business.

Los Angeles, Cal.—The Consolidated Garage Co., with a capitalization of $1,000,000, has been incorporated in Los Angeles and the following garages, the P. E., the Wall street, and the three-story C. C. & C. building on Los Angeles street, representing a valuation of $200,000, have come under the control of this new corporation, which also holds an option on the White garage on South Olive. The daily capacity of this group of garages is 1,500 cars. Buildings will later be constructed capable of housing twice this number of cars, and with this number off the streets the retail zone will be less congested. This new incorporation has been organized by F. C. Fenner and Elton Isbell, of Los Angeles, and A. C. Guild, of San Diego. It is the further purpose of the Consolidated Garage Co. to control a string of garages along the coast from Mexico to Canada, by which consolidation the motorist who tours much will, if he is a responsible owner, be able to get a letter of credit that will give him anything he wants in supplies or work at any of the affiliated garages; and the purchasing power of the corporation will result in furnishing cheapened supplies to its patrons.

Cleburne, Tex.—The Cleburne Motor Car Mfg. Co. has been organized here with a capital stock of $10,000. The incorporators are H. E. Luck, G. A. McClung, O. L. Bishop and others.

Columbus, O.—The White Motor Car Co., of Cleveland, has appointed C. E. Williams, formerly connected with the Columbus agency for the Speedwell line, manager of the Columbus branch of the White company.

Milwaukee, Wis.—A. Weisskopf, state agent for the O'Neil Tire Protector Co., and Oscar L. Bland have formed a partnership and established a general accessory and supply store and depot at 252 Fifth street.

Toledo, O.—Ernest Coler, formerly technical writer of advertisements for the Willys-Overland Co., has taken charge of the advertising department, succeeding Roy J. Buell, who has taken a position with the sales department of the Ohio Electric Automobile Co.

Green Bay, Wis.—Frank Fosha and L. P. Larson have opened a new garage and salesroom at 205-207 Washington street, under the style of the Washington garage. The building was remodeled from a large livery stable owned and operated by Mr. Larson, who on July 1 decided to transform his business to cope with the new order of things. The firm will represent the Mitchell, Overland and Little cars.

Recent Incorporations

Boston, Mass.—Pope-Hartford Co., of Boston, capital stock $100,000; incorporators, George L. Dodd, Charles W. Cousens, Fred H. Lucas.

Bucksport, Me.—Bucksport Motor Co., capital stock $6,000; incorporators, J. E. Witham, H. N. Churchill, H. E. Churchill.

Canal Dover, O.—S. Toomey Co., capital stock $60,000; to manufacture motor cars; incorporators, R. I. Toomey, S. J. Brister, Theodore Williams, M. C. Toomey, Oliver Toomey.

Chattanooga, Tenn.—National Auto Top Co., capital stock $15,000; George B. Crawford.

Chicago—Triangle Tire Co., capital stock $5,000; incorporators, Lawrence A. Cohen, Charles Aaron, Floyd M. Stahl.

Chicago—Commercial Motors Co., capital stock $1,000; incorporators, Farlin H. Ball, Agnes V. Lee, Golip A. Buresh.

Detroit, Mich.—Merralls Starter Co., capital stock $150,000; to manufacture gasoline engine starters, etc.; incorporators, William A. Merralls, Robert S. Neeley, Harlow B. Lowland.

Elyria, O.—Elyria Auto Sales Co., capital stock $10,000; incorporators, W. C. Bennett, F. S. Bates, Correll Smith, J. J. Dillon.

Goldsboro, N. C.—Blackburn Garage & Motor Supply Co.; capital stock, $25,000; incorporators, H. C. Smith, M. M. Allen, W. A. Blackburn.

Haverhill, Mass.—Rambler Motor Car Co., capital stock $10,000; incorporators, James P. Molloy, George A. Burnham, Charles S. Goodwin.

Hopkinsville, Ky.—Hopkins Cadillac Co., capital stock $10,000; general motor car and garage business; incorporators, R. E. Cooper, T. W. Blakey, Odie Davis, Richard Levall, E. G. Peterson.

Houston, Tex.—Cole Motor Car Co., capital stock $12,500; incorporators, J. J. Settegast, A. J. Bins, F. H. Buelow, David F. Burks.

Kansas City, Mo.—Shackelford Garage Co., capital stock $2,000; incorporators, Addison Shackelford, L. E. Shock, Paul Gee.

Lowell, Mass.—Automobile Transportation Co., capital stock $25,000; incorporators, Ralph P. Champney, George E. Hardy, George M. Faulkner.

Manhattan, N. Y.—Never Skid Manufacturing Co., capital stock $50,000; to manufacture skidding devices; incorporators, Charles H. Stanton, George L. Lewis, Daniel E. Wing.

Morgantown, W. Va.—City Automobile Co., capital stock $4,800; to manufacture and sell motor car supplies and operate a garage; incorporators, J. Leonard Yates, B. S. Dearing, N. B. Yost, Margaret Smith, Cora B. Dearing.

Norfolk, Va.—Auto Lighting Corporation of America, capital stock $400,000; incorporators, A. D. Newcomb, Wallee Hank, W. J. Simpson.

New York—Motormeter Co., Inc., capital stock $5,000; to manufacture motor car devices; incorporators, George H. Townsend, Harrison H. Boyce, Frederick J. Moses.

New York—R. H. Conty & Co., Inc., capital stock $2,500; to manufacture and sell motors, parts, etc.; incorporators, R. Henry Conty, M. Conty, Emil Frankel.

New York—Wright's Garage, Inc., capital stock $2,000; incorporators, William R. Dickie, Earl D. Wright, Elizabeth D. Wright.

New York—Central Park Garage Co., Inc., capital stock $500; incorporators, William E. Young, George J. Johnstone, Charles A. Frueauff.

New York—Detroit Cadillac Motor Car Realty Co., capital stock $100,000; incorporators, Edwin B. Griffin, Charles T. Green, Henry Amerman.

New York—Imperial Garage Co., capital stock $25,000; incorporators, W. F. P. Lofland, W. I. N. Lofland.

New York—Kammer Automobile Co., Inc., capital stock $10,000; incorporators, Max A. Kammer, Frances Kammer, William Magsamen.

New York—Perfection Automobile Body Co., Inc., capital stock $15,000; to sell motor car bodies and appliances; incorporators, William H. Mendell, William H. Mendell, Jr., James V. Simpson.

New York—Grant Six Co., Inc., capital stock $15,000; incorporators, Clarence P. Hulst, William G. Miller, James B. Speyer.

New York—Automobile Information Pub. Co., Inc., capital stock $10,000; to print and publish motor car trade lists; incorporators, Albert F. Britton, Robert B. Johnston, Freeman C. Britton.

Rochester, N. Y.—Automobile Safety Fender Co., capital stock $100,000; to manufacture motor car appliances; incorporators, William A. Snyder, Jr., Abram DeWolf, Abram Bune.

Salt Lake City, Utah—Utah Automobile Livery and Taxicab Co., capital stock $50,000; incorporators, Ave Meeking, Jr., Frank J. Guston.

St. Louis, Mo.—Dallas Motordrome Co., capital stock, $2,000; incorporators, Leroy M. Edwards, E. L. Winterman, A. E. Koerner, A. M. Stracker, James S. Arthur.

St. Louis, Mo.—Heinrich Automobile Co., capital stock $2,500; incorporators, Val Heinrichs, Margarette Heinrichs, Casper Lyham.

St. Louis, Mo.—St. Louis Motor Transportation Co., capital stock $25,000; general repair work; incorporators, W. E. Bush, Frank Bush, Knox Tussig, William A. Thomas.

St. Louis, Mo.—St. Louis Motor Transportation Co., capital stock $25,000; to contract for motor truck handling; incorporators, William R. Bush, Frank Bush, Richard S. Locke.

Utica, N. Y.—Otis Motor Sales Co., capital stock $10,000; incorporators, Edward J. Otis, William Cantwell, T. Harvey Ferris.

Walpole, Mass.—Walpole Tire and Rubber Co., capital stock $4,500; incorporators, Ernest W. Tinkham, Alvi T. Baldwin, James Dowdle.

Yoakum, Tex.—Automobile and Garage Co., capital stock $20,000.

Youngstown, O.—Youngstown Taxicab Co., capital stock $10,000; to operate and maintain a taxicab business and garage; incorporators, David Friedman, Sadie Friedman, Harris Friedman, Helen Friedman, Bert Friedman.

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when the car is to be left itself for some months, some little care on the part of the owner is necessary to put it into condition for this period of hibernation.

Among the first things to be done on putting the car away for the winter is to give it a thorough cleaning. Generally the last runs before the owner literally got cold feet, have been made over muddy roads, and the wheels, frame and body are covered with mud. If it is allowed to remain for several months, the body finish will be permanently spotted. Then clean out the lamps and acetylene generator. Take off all the brass or nickel fittings, lamps, horn and so on. It is a good stunt to store these with the cushions and mats in the house. Give all other bright parts a coat of vaseline to protect them from rust. Be sure to leave the top up and tighten the straps as much as possible, for if the top is left folded down it will be full of cracks in the spring.

Gasoline Evaporates

There is no economy in leaving the gasoline in the tank over winter, for the little that will not have evaporated before spring certainly never will vaporise in the carbureter. So drain out all the gasoline from the tank and carbureter, and the oil from the bottom of the engine and the oil tank. In order to keep the residue of oil from gumming up the walls of the tank and the oil leads, the best plan is to flush the whole oil system out with kerosene. Treat the cylinders in the same way and you will not find the pistons stuck so that the engine cannot be cranked in the spring. Have the storage battery fully charged, empty out the liquid, wash out with water and then fill it up with rain water.

Of course, the most important step is to drain out all the water from the cooling system. Open up all cocks in the water line and run the engine a few moments till it warms up to make sure the water is all out. Next to the water, the most important subject of precaution is that of the tires. In order to relieve them of the strain of supporting the weight of the car during its period of inactivity, the machine should be raised clear of the floor several inches and supported on jacks or tire savers. If these are not at hand in adequate supply, wooden trestles or even boxes can be made to do nicely. Then throw a tarpaulin over the car and forget it till spring.

Care of the Tires

If the motorist wants to be really careful of his tires he will take them off of the rims, clean them up, vulcanize any cuts that have appeared and then wrap them up. Lay them on a shelf where it is fairly dark in the garage and they will be ready to put on in the spring.

However, as we have remarked before, the motor car now is an all-the-year-around vehicle, what with anti-freezing compounds and starters, and in big cities especially there is no need of laying the car up when old Winter takes the wheel.

General Motors' Report

Net Profit of $4,838,488.55 for Year Ending July 31, 1912, Made by Holding Concern—Gross Business Done Shows Increase of $22,000,000—President Neal's Views

DETROIT, Mich., Oct. 17—The report to the stockholders of the General Motors Co. for the fiscal year ending July 31, 1912, was made public today. The income account shows a net profit of $4,838,448.55 after deducting $904,822.12 for depreciation of buildings and equipment, in addition to the ordinary expenses necessary to plant maintenance. The gross business done for the year shows an increase of $22,000,000 over that of the previous year.

The report also shows the outstanding capital stock of the company, not including stock held in its treasury and in the treasuries of its subsidiary companies, on July 31 as follows: Preferred stock, 7 per cent cumulative, $14,936,800; common stock, $16,371,183.05.

According to the report this represents an increase during the year of $543,300 preferred and $548,853.05 common stock. Of this increase $520,000 preferred and $520,000 common stock were delivered in part payment of the purchase of the outstanding capital stock of the Weston-Mott company.

The total profits from the operation of the profitable subsidiary companies amounted to $5,770,177.90, after deducting all expenses of the General Motors Co., from which has been deducted $1,023,421.40 for losses in the other subsidiary companies, leaving combined net profits to the General Motors Co., after deductions for depreciation of $4,846,756.50. These profitable subsidiaries as distinguished from those which did not operate to a profit, did 88.72 per cent of the total business of the entire General Motors organization, and according to the report successfully carried through on time their entire manufacturers' schedule, having sold their entire stocks of cars before the close of the fiscal year. It is predicted in the report that these same subsidiaries will produce probably close to 95 per cent of the entire output of the organization.

A net working capital of $20,666,865.16 is shown by the balance sheet, made up as follows:

Current assets:		
Cash		$ 3,080,920.98
Notes, $262,273.33, and accounts receivable		4,220,112.51
Inventories		17,578,306.15
Prepaid expenses		422,736.13
Total current assets		$25,311,135.77
Less current and accrued liabilities:		
Current accounts payable	$2,853,021.77	
Notes payable, Weston-Mott company	600,000.00	
Interest, taxes and pay-rolls accrued, not due	929,854.84	
		4,382,876.61
		$20,928,259.16
From which deduct amount reserved for 3 months' proportion of preferred dividend No. 8, payable November 1, 1912		261,394.00
Net working capital		$20,666,865.16

The capital expenditures amounted to $1,848,206.51 which was used for additions to real estate, plants and equipment. About half of the capital expenditure was used in the enlargement of the Cadillac Motor Car Co.'s plant and equipment, the output from which plant increased from 10,000 cars in 1911 to 12,000 for the past fiscal year.

In addition to the financial statements contained in the report, it treats of transportation difficulties with which the General Motors Co. has been confronted during the last year, as well as discussing results of the years' business and the outlook for future developments. President Neal's report follows:

Since your present board of directors assumed active control of your company's affairs on December 2, 1910, study of the conditions surrounding your several companies and prevailing in this industry has led them to the conclusion that the small motor car factory is badly handicapped and will become more and more so year by year.

Accordingly, your directors have been gradually concentrating the operations of the smaller companies with the larger and more profitable companies, or else, in some cases, eliminating the greater part of their machinery operations and so turning these smaller companies into plants merely for the assembly and distribution of the motor cars. This policy was inaugurated cautiously, and necessarily has proceeded slowly. The transfer of the manufacturing operations has in most cases involved the completion of the entire operations in hand at these smaller factories and also generally the design of new models before the necessarily standardized output of the larger factories could be utilized. This process has gathered momentum during the year just closed, and will be continued in the case of several of the companies during the coming year, the machinery of the smaller plants being gradually concentrated at the larger manufacturing plants.

The gross business of General Motors companies has suffered no diminution in consequence of these changes, the total for the 10 months ending July 31, 1911, amounting to $42,733,303.27, and for the year just closed $64,744,496.02.

These changes, for example, have thrown the manufacture of engines for these smaller companies into the large and highly specialized engine plant of your subsidiary company, the Northway Motor and Mfg. Co. This policy is adding to the profits of the Northway company, and at the same time these smaller companies are obtaining better engines than a small shop can hope to design, at less cost than they could be produced in the smaller factories.

It may be interesting to note in this connection that the Northway company, which produced only 4,846 engines for the 10 months ended July 31, 1912, is scheduled to produce the coming year, 20,000 engines. This increase is due partly to the policy spoken of, but also in large measure to the marked improvement in, and present high quality of the Northway engine, which caused the available surplus productive capacity of the Northway factory to be sought by other manufacturers far in excess of the Northway company's maximum capacity which, at present, with some moderate enlargements, just about completed, is 20,000 engines per annum.

The number of employes in your factories at the height of the manufacturing season of 1911 was 11,474; in the season of 1912, 16,584; and at the date of this report, 17,173. Your manufacturing operations for the current season are more advanced than during either of the 2 preceding years, and the cash re-

Benjamin Briscoe Resigns

Head of United States Motor Co. Will Step Out About November 1, After Which He Will Make Extended Vacation Trip to Europe—More About Reorganization

ceipts for the first 2 months of the new fiscal year were more than a million dollars ahead of the corresponding period last year. Your leading factories are still unable to supply the insistent demands for immediate delivery, and at this writing a further substantial increase for the coming year in your output and sales seems practically assured. It is believed that this will be accomplished by a gratifying increase in net profits.

An interesting feature of President Neal's report relates to the number of employes in the factories of the concern, it being shown that at the height of the 1912 season there were 16,584, while at the present time there are approximately 17,173 persons connected with the organization. The officers of the General Motors Co. are: Thomas Neal, Detroit, president; W. C. Durant, Detroit, vice-president; C. W. Nash, Flint, vice-president; Emory W. Clark, Detroit, vice-president; Standish Backus, Detroit, secretary; James T. Shaw, Detroit, treasurer; W. H. Alford, Detroit, comptroller.

The members of the finance committee are Emory W. Clark, W. C. Durant, Andrew H. Green, Jr., Edwin D. Metcalf; M. J. Murphy, Thomas Neal, James J. Storrow, Albert Strauss.

The directors consist of Joseph Boyer, A. N. Brady, Emory W. Clark, M. J. Murphy, Thomas Neal, James J. Storrow, W. C. Durant, Andrew H. Green, Jr., J. H. McClement, Edwin D. Metcalf, Albert Strauss, N. L. Tilney, James N. Wallace, Jacob Wertheim.

The following concerns in the motor industry are affiliated with the General Motors organization:

Buick Motor Co., Cadillac Motor Car Co., Olds Motor Works, Oakland Motor Car Co., Elmore Mfg. Co., Cartercar Co., Northway Motor and Mfg. Co., Peninsula Motor Co., Randolph Motor Car Co., Rapid Motor Vehicle Co., Reliance Motor Truck Co., Welch Co. of Detroit, Welch Motor Car Co., Champion Ignition Co., Jackson-Church-Wilcox Co., Michigan Auto-Parts Co., Michigan Motor Castings Co., Oak Park Power Co., McLaughlin Motor Car Co., Ltd., Weston-Mott Co., General Motors Export Co., General Motors Truck Co., General Motors (Europe), Ltd., General Motors Co. of Michigan.

LA CROIX THREATENS SUIT

New York, Oct. 14—Aggressive action on the part of the American representatives of the Mercedes pleasure cars has been indicated by the announcement made by Paul La Croix, of New York, licensee of the Daimler Mfg. Co., that infringement of the Mercedes patents and the license rights of the La Croix company will result in prosecution. The chief element of the difficulty is that a number of Americans have purchased Mercedes cars abroad and imported them without paying license to La Croix. The broader question of patent infringement is included in the problem that is presented by La Croix's action.

NEW YORK, Oct. 21—Benjamin Briscoe, president of the United States Motor Co., has announced his retirement from the leadership of the corporation, to take effect about November 15. The resignation was presented to the directors 3 weeks ago, or as soon as it was apparent that the reorganization plan would go through substantially on the basis agreed to by the creditors.

Mr. Briscoe has been a prominent figure in the motor car world for many years, but has been a leader since 1910. He was one of the founders of the Maxwell-Briscoe Motor Co., Briscoe Mfg. Co. and other large and profitable concerns. He was instrumental in the formation of the United States Motor Co. He was organizer and president of the A. M. C. M. A. and at present holds the post of vice-president of the N. A. A. M. He is secretary and director of the Automobile Board of Trade.

Mr. Briscoe has announced that he contemplates a trip to Europe with his family and during it he will arrange several matters of importance to the extension of the export business of the company.

The new stock issues of the reorganized company have been introduced into the curb market and have been traded in conditionally since last week. All the transactions are made with the proviso that the deliveries shall be made when the stocks are issued. The new common sold as high as 11½; first preferred up to 80 and second preferred at 40.

Under the proposed plan of reorganization, the stock will remain in a voting trust for not to exceed 5 years, except such shares as are required for the qualification of directors. The capitalization will be:

First preferred, 7 per cent cumulative	$11,000,000
Second preferred, 6 per cent non-cumulative	9,000,000
Common	11,000,000
Existing real estate mortgages	164,540
Total	$31,164,540
The total authorized capitalization will be	35,091,393

In a tabulation of estimated earnings for the first full fiscal year under the reorganization, the net is placed at $1,500,000. This sum would be sufficient to pay dividends on both preferred issues and leave $190,000 for the common.

Charles H. Sabin, Harry Bronner and James C. Brady have been named as the voting trustees in whom the active rights of the shares shall be vested for a term of years.

The underwriting syndicate by which it is proposed to finance the new company has agreed to purchase for $5,720,996 all the voting trust certificates representing the stock allotted to assenting stockholders. The Central Trust Co. of New York has been designated as depositary for securities and claims.

The return day for the court action, commenced by the Brown & Sharpe Mfg. Co., is October 28, when it is expected that the official status of the proposed organization will be determined.

KING COMPANY RESUMES

Detroit, Mich., Oct. 21—The King Motor Car Co., the entire assets of which were purchased outright by Artemus Ward of the firm of Ward & Dow, New York city, has been placed on a sound financial basis by its new owner. Already operations have been commenced in the plant for the turning out of the new models for the 1913 season, which consist of a roadster, touring car and coupe. The personnel of the new company has been completely changed and it is entirely in the hands of men who have had long experience in the motor industry. J. G. Bayerline, formerly connected with the Pope-Toledo, Pope-Hartford, Oldsmobile and Hudson, and up to a short time ago vice-president and general manager of the Warren Motor Car Co., has assumed the management.

It is the intention of the new King company to protect owners and all guarantees issued by the old concern will be assumed. It is also announced that a complete supply of repair parts will be carried in stock, and that deliveries on the new models are now being made. The cars will be sold under the trade name of King.

NEW KNOX OFFICERS ELECTED

Springfield, Mass., Oct. 18—Stockholders of the Knox Automobile Co. held a meeting here at which the committee appointed to investigate the business and determine whether it could be profitably continued, reported favorably.

New officers and directors were elected as follows: President, W. E. Wright; vice-president, H. G. Fisk; treasurer, A. E. Smith; clerk, Charles H. Beckwith. The directors elected are H. G. Fisk, E. O. Sutton, W. H. Chase of Leominster, M. J. Greenwood of Gardner, Elijah C. Johnson of Hartford, Conn., Peter Murray, W. H. Cutler of North Wilbraham, W. E. Wright, C. H. Beckwith. The executive committee of the board of directors will be composed of Peter Murray, W. E. Wright and E. O. Sutton.

PUTTING OUT NEW CARBURETER

New York, Oct. 21—The Schoen-Jackson Co., of Media, Pa., has finished the building of a complete plant in addition to the other factories of the company and will manufacture a new type of carbureter to be known under the trade name of Fepa. According to the announcement of the company, the device is the invention of J. L. Fritz and among its special features claimed for it by the company is the fact that it has no springs, balls, cams or reeds.

Round the Lake a Rough Trail to Follow

Two Days of Running in Chicago Motor Club's Sixth Annual Reliability Sees Elimination from Perfect Score Division of Nine of the Fifteen Starters

OSHKOSH, WIS., Oct. 21—Fourteen cars finished the first day's run with perfect scores in the sixth annual reliability contest of the Chicago Motor Club today. Only one of the fifteen contestants which lined up at the start of the strenuous plug around Lake Michigan fell by the wayside.

When the cars had checked in here tonight after their first leg of 171 miles from Chicago, the only car missing was the National No. 8, entered by the Chicago Spring Wheel Motor Co., and equipped with spring wheels made by the entrant. This car had trouble with its rear axle in the morning and failed to check in at the noon control at Milwaukee. A wire was received here this evening by Starter Watts saying that the National was on the way and would be in Oshkosh before morning start.

Originally there were twenty-two entries, but seven were scratched—two Coey Flyers, the Chalmers six, Falcar, Detroiter, one of the three Stutzes and one of the Gray & Ritter entry. The Chalmers was in the Iowa reliability and could not get here in time, while most of the others were not ready when the starting time came. The Gray & Ritter car was a special which was to be used to try out a rotary valve motor, but the chassis was not ready in time to install the engine.

The field was reduced again tonight when Morton H. Luce, who had entered and was driving the Velie roadster, was compelled to abandon the tour because of a business deal which developed after he had started in the contest.

The threatened arrest of N. H. Van Sicklen, Sr., one of the judges, and who was distributing the confetti in the pilot car, was the only incident of the day. The Oshkosh chief of police considered it his duty to arrest the pilots for throwing confetti in the city streets, but was talked out of it.

Starting this morning under a cloudless sky, tourists found good roads all the way to Milwaukee. From there on the quality of the road varied. Most of it was fine gravel highway, and near Fond du Lac a stretch of about 4 miles of cement roadway was found which enabled the drivers to make up time lost on some of the poorer portions. A driving rain was the only uncomfortable feature of the afternoon, but this lasted only an hour—sufficient to make mud roads for the rest of the way to Oshkosh.

Tomorrow's run takes the tourists to Escanaba, in northern Michigan, a distance of 177 miles from Oshkosh. The noon control is to be at Oconto, 89 miles away. The road tomorrow includes some dirt which, with today's rains, will probably be mud. With the exception of a few miles, the road is expected to average fairly good through Neenah and Green Bay to Oconto, thence to Marinette. From there to Escanaba there is a stretch of fine macadam 63 miles in length, built under bounty from the state. Summaries first day:

TOURING CAR DIVISION

No.	Car	Driver	Penalties
1	Velie	John Brolley	0
2	Case	J. Hanson	0
3	Staver	E. T. Knudson	0
4	Staver	G. Monckmeier	0
5	Bergdoll	A. Monsen	0
6	Abbott	A. M. Robbins	0
7	R. C. H.	B. Parke	0
8	National	R. B. Gray	*

ROADSTER DIVISION

101	Velie	M. H. Luce	0
102	Stutz	R. E. Maypole	0
104	Burgdoll	T. Rooney	0
105	Moline	J. A. Wicke	0
106	Moline	F. G. Salisbury	0
109	Stutz	C. Anderson	0
110	R. C. H.	M. Barney	0

* Not reported—late

Many Penalized Second Day

Escanaba, Mich., Oct. 21—Special telegram—Six out of fifteen cars in the Chicago tour completed the second day's run to Escanaba tonight. Five have received penalties today, one had not checked in at 10:30, and three have withdrawn from the contest. Gray's National No. 8 withdrew at Racine; Velie No. 101 withdrew at Oshkosh this morning, and the R. C. H. went out this afternoon with a frozen motor.

Practically all the trouble to cars receiving penalties was due to rain, which continued almost without cessation from noon yesterday till this afternoon. Roads which would have been good in dry weather were made so sloppy that mud and water splashed in on magnetos and carbureters. There were two hills with mud so deep and so thick that several cars were stalled and had to be helped up. About 50 miles of state-built macadam between Marinette and Escanaba permitted the cars to make 50 miles an hour. Much time lost in negotiating bad stretches was made up on this road.

Velie No. 1 dropped 2 points for cleaning the carbureter which was stopped up with mud. Staver No. 3 got 8 points for the same trouble. Bergdoll No. 5 broke a steering knuckle near Green Bay, but Monsen, the driver, put in a new one and got into the night control less than 3 hours late, sustaining 161 points penalty. Bergdoll No. 104 was stuck for 30 minutes in a mudhole, but pulled itself out with a winch driven by the motor, receiving 30 points for lateness. Stutz No. 109 came into Escanaba several hours late on accounts of battery trouble and fenders bent by a broken tire chain, sustaining 182 points. Stutz No. 102 has not checked in and is over 6 hours late. Branstetter's Kisselkar, acting as pilot, had carbureter trouble at noon, and the Case threw the confetti for the rest of the day. The Staver pacemaker also had carbureter trouble from rain and mud, and Referee Root nominated the Velie as pacemaker for the day. The R. C. H. press car chugged through in good order, but had a narrow escape from upset when it skidded to the edge of a 12-foot ditch. Skillful driving kept it from going over the edge.

The Midland, carrying Starter Watts was held up at Green Bay and both Watts and the driver, Kavanaugh, were arrested for scaring a horse and wrecking a buggy. They were not detained long.

The five cars finishing the day with perfect scores are: Case, Staver No. 4, Abbott, R. C. H. No. 7, and two Molines. Today's run of 177 miles, from Oshkosh to Escanaba, was covered at the regular running schedule of 20 and 18 miles per hour. It took hard driving to maintain the schedule through mud. The noon control was at Oconto. Tomorrow's run, from here to Newberry, is expected to be the hardest of the trip on account of the naturally poor road conditions and excessive rain. Although the distance is only 125 miles, the running schedule has been reduced to 13 and 11 miles per hour, with the noon control at Manistique. Summaries:

TOURING CARS

No.	Car	Driver	Penalties
1	Velie	J. Brolley	2
2	Case	J. Hanson	0
3	Staver	E. T. Knudsen	8
4	Staver	G. Monckmeier	0
5	Bergdoll	A Monsen	161
6	Abbott	A. M. Robbins	0
7	R. C. H.	B. Parke	0

ROADSTERS

102	Stutz	R. E. Maypole	Not in
104	Bergdoll	T. Rooney	30
105	Moline	J. A. Wicke	0
106	Moline	F. G. Salisbury	0
109	Stutz	C. Anderson	182

SOUTHER GOES TO EUROPE

New York, Oct. 22—Henry Souther, metallurgical expert and former president of the Society of Automobile Engineers, has sailed for Europe, in company with two officials of the Standard Roller Bearing Co., to inspect the plant of the Rudge-Whitworth Co. in England and to visit other manufacturing plants on the continent. It has been announced that Mr. Souther and his party will make a special study of the combination of the Sangster-Houk demountable rim with wire wheels of the type made by the Rudge-Whitworth company.

Ford, Driven by Owner, Wins Iowa Test

Results in Little Glidden of the Hawkeyes a Surprise Party to Dealers Because of Fine Driving of Dr. R. W. Soper —Only Penalty Caused by Water in Gasoline

DES MOINES, Ia., Oct. 21—A Ford roadster owned by Dr. R. W. Soper of Luther, Iowa, is the winner of the sweepstakes of the Iowa Automobile Association reliability run which closed Saturday night after a 5-day circuit over Iowa.

The little car went through with almost a perfect score, the only penalty being occasioned by water in the gasoline which caused the driver to stop the motor. In addition to winning the sweepstakes the Ford car takes the cup for the winning car in the $800 class.

The Paige roadster, driven by Bruce Malcom of the Paige factory, took first in the class for cars from $800 to $1,200. August Gronau of Des Moines, with a 1909 Chalmers, won first for the $1,200 to $1,600, and the Warren entry, which also acted as pacemaker, drew down the cup for cars in the $1,600 to $2,000 class.

No scores were announced by judges, only the names of the cars winning in their respective classes being given out.

Despite the fact that there was a small number of entries, the tour was by far the best ever held in the state. Far more interest was taken in the run outside of Des Moines than there was by the local dealers. Good roads associations fairly vied with each other in making for the pleasure and comfort of the contestants.

The penalties inflicted were for time on magnetos, time on tires, time on steering gear and time on gasoline tank.

Never before has any motor tour through Iowa met with such hospitality as was extended the little Glidden contestants. There were always from fifteen to twenty-five visiting cars with the run and at one time there were more than fifty from the towns along the route, acting as escorts for the contesting cars.

The first day out the towns along the White Pole road from De Soto to Council Bluffs declared holidays and spent their time in entertaining the tourists. All the towns were decorated and the roads had been dragged just an hour before the cars came along. Some of the White Pole enthusiasts escorted the competing cars all the way into Council Bluffs from De Soto. Council Bluffs was the first night control.

The second day's run from Council Bluffs to Sioux City, along the Missouri river, was the lightest of any during the tour, although the roads were not as good as others on the route. The third day took the tourists well into northern Iowa, the Hawkeye highway being followed part of the way from Sioux City to Fort Dodge, which was the third night control. Waterloo was the noon control on the fourth day and a most enthusiastic reception was given the tour here by the motorists of Waterloo and Waverly. Cedar Rapids was the night control.

The last day out furnished the longest drive of any day of the run, the distance between Cedar Rapids and Des Moines being close to 200 miles. Oskaloosa, the noon stop, was the last control and the cars sped through all the remaining cars on the route to get into Des Moines before dark Saturday night. The last car checked in at 5:10.

The fact that the contest had been postponed no fewer than three times prevented many Des Moines dealers from entering cars who had expected to do so. Many of the dealers were afraid of roads and weather so late in the season, but the contestants report the road conditions almost ideal and the weather during the entire week was well nigh perfect.

Dr. Soper, winner of the sweepstakes, is receiving unusual credit for his winning on account of the fact that his was the only privately owned car entered.

BOOSTING FOR ROADS IN OHIO

Toledo, O., Oct. 19—The Ohio Good Roads Federation, held a meeting at Columbus, Thursday afternoon, and inaugurated a campaign for legislation enabling the state still to realize the federation's project for an inter-county highway system. A resolution was adopted pledging the federation to work for the enactment of a law next winter authorizing a direct tax levy of $3,000,000 on the grand duplicate of the state for this purpose.

In order to stimulate the education of good roads experts the federation appointed a committee to urge Ohio State university and other educational institutions to include in their curricula courses in good roads construction and maintenance. The following were elected officers of the federation. Pesident, Jesse Taylor, of Jamestown; vice-presidents, John N. Willys and H. C. Vortriede, of Toledo; F. A. Seiberling, Akron, O.; A. P. Sandles, Ottawa, O.; David Dunham, Lebanon; secretary, H. K. Laird, Columbus; treasurer, B. S. Humphries, Cleveland; superintendent, W. A. Alsdorf, Johnstown; counsel, Smith W. Bennett, Columbus. Trustees, Will T. Blair, Thomas Henderson, B. S. Humphries, Fred C. Wood and Fred H. Caley, of Cleveland.

ELECTRIC MEN MAY TAKE PALACE

New York, Oct. 22—The New York Electrical Vehicle Dealers' Association has modified its plans with regard to the establishment of a motor mart for electrics. It was proposed to permanently rent the top floor of the Grand Central palace for the purpose, and to distribute the electric exhibits along the walls, leaving the track common to all and always ready for demonstrating work. The location of the palace, in close proximity of Fifth avenue and the boulevard, now nearing completion, between Forty-second and One hundred and twenty-fifth street, is said to be considered a great argument in favor of the project. A committee will shortly be named to elaborate on these plans.

Furthermore, the association hopes to straighten cooperative feeling between the dealers by their exhibiting in a common space, as knocking in such quarters would necessarily hurt the whole electric-car business. Corporate advertising is also among the aims of the association.

GOVERNMENT WANTS TRUCK BIDS

Washington, D. C., Oct. 19—More than ordinary interest attaches to a call for bids issued by the general supply committee of the government departments for furnishing various branches of the government service with both gasoline and electric vehicles. The bids will be opened in this city October 29.

Complete specifications are given in the blanks to be furnished manufacturers who have been asked to submit proposals. The specifications have been standardized by the bureau of standards, the purpose being to have trucks of a distinct type in the government service in the future. The specifications call for bids on trucks ranging from 1,000 pounds to 3,000 pounds capacity. The small trucks are intended for mail wagons, but the government does not yet know whether it will buy small or large machines.

The object of asking for bids on different types of cars, both electric and gasoline, is to obtain comparative information as to prices, etc. Manufacturers are told that for the present probably not more than half a dozen machines will be bought, but that this number will increase in the future.

Manufacturers desiring copies of the proposal blanks, together with full specifications, can obtain them by addressing the general supply committee, treasury department, Washington, D. C.

FILES BANKRUPTCY PAPERS

New York, Oct. 22—Schedules in bankruptcy filed in the United States district court by the Wishart Dayton Auto Truck Co. show liabilities of $33,899 and nominal assets of $13,569. The latter consist of one truck, a few accounts, and a claim of $10,000 for damages against the Dayton Auto Truck Co. The creditors are mostly banks.

Willys Increases Capital to $25,000,000

NEW YORK, Oct. 23—Special telegram—President John North Willys, of the Willys-Overland Co., Toledo, O., has increased the capital stock of this company from $15,000,000 to $25,000,000. The new capitalization is made up of $20,000,000 common and $5,000,000 preferred. This new capitalization represents an increase of $10,000,000 common. W. Salomon & Co., 25 Broad street, New York city, have purchased from Mr. Willys $5,000,000 common and $2,900,000 prefered, so that Mr. Willys will personally retain $15,000,000 common and $2,100,000 preferred.

This new capitalization means that Mr. Willys will take several millions out of the business and that the organization will be carried on on a larger scale than heretofore. At present the Willys-Overland factories are shipping 150 cars a day, and this output is on the increase.

With this increase in capital and the introduction of New York banking capital into the company, all of the stock of which up to the present has been owned personally by Mr. Willys, there will not be any changes in the management of the company. Mr. Willys will remain in personal charge, and his organization of capable lieutenants will not be changed.

Application will be made to have the Willys-Overland stock listed on the New York stock exchange.

During the last week rumors have been frequent that other companies were merging in a certain deal, but Mr. Willys positively denies any such rumors. At present the Willys-Overland Co., Toledo, O., has five subsidiary companies which are the properties of Mr. Willys. These properties are: The Kinsey Mfg. Co., Toledo, O.; Federal Motor Works, Indianapolis, Ind.; Garford Mfg. Co., Elyria, O.; Mora Mfg. Co., Elmira, N. Y., and Gramm Motor Truck Co., Lima, O.

No changes in the management of any of these will be made as a result of the present expansion of the Willys-Overland Co., which is a holding organization in relation to these subsidiary concerns.

With the new organization Salomon & Co. will not be represented on the executive committee, but the board of directors will in all probability be increased from five to seven, Salomon having two representatives and Willys five.

In addition to owning 75 per cent of the Willys-Overland stock, Mr. Willys has upwards of $2,000,000 investments in concerns identified with the motor industry, making his total holdings of $20,100,000.

The past year has been a very successful one for the Willys-Overland Co., the financial report June 30, 1912, for the 11 months showing profits of $3,300,000. At present the Willys-Overland Co. and the subsidiary companies have the following works forces: Willys-Overland, 5,300; Kinsey Mfg. Co., 1,200; Morrow, 1,000; Garford, 900; Gramm, 400; Federal, 300; total, 9,100.

The Kinsey Co. manufactures frames and radiators for the Overland cars and for the trade. The Morrow Co. builds gearsets, universal joints and screw machine parts. The Federal Motor builds motors for the trade and repair parts. The Garford Co. builds pleasure cars and trucks and the Gramm Co. trucks.

The several subsidiary companies are capitalized as follows: Garford, $2,000,000; Gramm, $1,500,000; Federal, $300,000; Morrow, $1,000,000; Kinsey, $3,000,000.

There will be a general conservative expansion in the Willys-Overland and all of the subsidiary companies.

The Willys-Overland will build 40,000 cars for 1913 and 60,000 for 1914. At the Gramm plant a new 1,500-pound truck is to be brought out and a new six-cylinder Garford will be brought out to sell at a medium price.

Banking Interests Purchase Big Block—No Changes to Be Made

PEERLESS RAISES NEW CAPITAL

New York, Oct. 23—Special telegram—Additional capital, said to be $1,500,000, has been secured to enlarge the scope of the Peerless Motor Car Co., of Cleveland, O., according to indirect reports received in New York this week. President Kittredge is said to have interested J. Robert Crouse, a multi-millionaire of Cleveland, and the additional money was secured without going into the open market. The expansion of the truck end of the manufacturing business is given as the main cause for the new financing of the company.

Reports have been current that Mr. Kittredge was to retire from active direction of Peerless affairs, but official denials have followed the spreading of the reports.

RECEIVER FOR HALLADAY

Chicago, Oct. 23—Following the filing of a petition by creditors of the Streator Motor Car Co., Streator, Ill., who alleged the concern was insolvent, Federal Judge Landis late this afternoon appointed the Central Trust Co. receiver, under bonds of $5,0000, of the company that makes the Halladay car.

DAIMLER IMPORT CO. IN COURT

New York, Oct. 22—Bankruptcy proceedings have been instituted in the United States district court against the Daimler Import Co., which up to a short time ago represented the importation of Mercedes cars and trucks into the United States. The crisis resulted from alleged non-payment of rent to Harry Content & Co., owners of the premises at 751 Fifth avenue. The claim is for $1,826.

Judgments in favor of banking creditors have been rendered against the company within the past week amounting to $23,278. Nobody with any substantial interest in the company would predict its future course, and Paul La Croix stated that he understood that the concern had been practically abandoned.

FIRE ENGINE COMPANY REORGANIZES

Elmira, N. Y., Oct. 21—In order to provide the concern with $600,000 additional cash capital, the American-LaFrance Fire Engine Co., Elmira, N. Y., is considering complete reorganization. The plan proposed by the fiscal agents of the engine company provides that the present bond holders will receive 100 per cent in 7 per cent preferred stock of the new concern with a bonus of 33.3 per cent in new common stock. The preferred stockholders are to receive 50 per cent in the new preferred stock and 33.3 of common, while the present holders of common stock will receive 30 per cent in new common. With the $600,000 new preferred stock to be sold at par there will be a bonus of 100 per cent of new common.

ST. LOUIS HAS TIRE FACTORY

St. Louis, Mo., Oct. 19—Articles of incorporation were filed in Clayton, the county seat of St. Louis county, last week by the St. Louis Tire and Rubber Co., with a capital stock of $150,000 fully paid. The company is to use a building in University City, which was formerly used by one of the E. G. Lewis companies. Harry C. Barker, one of the directors of the new company stated that extensive improvements would be made in the building and that the company expects to be turning out motor car tires in about 6 weeks.

The concern will be managed by J. A. Swinehart, formerly of Ohio. The contracts with him and the patents are placed in the capital stock at $59,100 while the balance is subscribed in cash. Swinehart, the largest individual stockholder, has 900 shares of stock and the other six who have been named directors each have 100 shares. They are Harry C. Barker, C. M. Skinner, A. C. Einstein, W. H. Glasgow, Roy F. Britton and C. C. Collins.

Contracts will be let in a few days for the erection of an addition to the present building 30 by 100 feet in which will be placed the heavier machinery. All the machinery necessary for the operation of the plant has been received and the work of installation will start immediately, it is announced.

Traffic Worries Boston Commission

Sight-Seeing Motor Buses in Particular Cause Trouble in the Hub

BOSTON, Mass., Oct. 19—In its annual report just made public the Boston street commission has some interesting remarks to make relative to traffic regulations and sight-seeing buses. The commission would like to get rid of the job of looking after the motor buses because there are so many fights over locations each year, and there is a lot of political wire-pulling to get the best places. There also has crept in an abuse of which the commission only learned recently, but which it does not mention in its report, however, this being a species of graft where the person who owns the property or conducts a store just where the motor bus stands forces the owner of the sight-seeing vehicle to hand out something before signing a paper favorably, the street commission having insisted on this, believing it would cut down the number of requests for down-town streets.

Commission's Views on Traffic

Relative to the traffic regulations the commission states: "During the year, especially while the holiday traffic was at its worst, there was some complaint as to the working of the traffic regulations in the shopping district. Fault was found with the standing of vehicles in the side streets leading to Washington and Tremont streets. The complaints applied to delivery wagons as well as carriages and motor cars. Some people, if they could have their way, would not permit vehicles to stand longer than to allow their passengers to alight or get aboard, and it was suggested that the traffic regulations be amended to bring about this result. The board, while alive to the interests of the shopper who makes her way among the stores on foot, is conscious of the fact that there is a large number of people who come into the retail shopping district in vehicles of one kind or another. The desires of these people to reach the shopping district in this way cannot be ignored.

Carriage Trade Important

"The carriage trade, as it is called, is an important element in the retail business of the city. Many of this class of shoppers come from afar, from beyond the city limits. They are good customers and they should not be deprived of the privilege of standing their vehicles in some place convenient to them and to the stores they visit for a reasonable length of time. Unfortunately the retail district is so congested, the streets are so narrow, the open spaces are so lacking, that the matter cannot be regulated to give the best results. If the district possessed large squares or even a few fairly wide side streets a solution of the problem might be found in the setting aside of some of them for parking purposes. When the traffic regulations were being drafted 3 years ago the board had this difficulty in mind. It made a trial of a plan requiring vehicles entering the retail district to stop only long enough to permit their passengers to enter or leave them. The plan was not a success. Not only did the owners of the vehicles object but the shopkeepers joined them in protest, the latter claiming that the rule caused them a serious loss in their business.

Parking Space Limited

"Since the traffic regulations were put into effect the common side of Tremont and Park streets have been reserved for the vehicles of shoppers as a parking space. Vehicles are allowed to stand at these places for half an hour at a time. The board has often been asked to extend the time, some suggestions being for an hour, some for 2 hours, and it has been suggested that as long a time as 4 hours be allowed. The argument for the extension of the time is that women cannot do much shopping in half an hour. This the board does not presume to dispute. On the contrary, it agrees that the present time limit is too short.

"The space along the common on Tremont and Park streets is not equal to the requirements. It cannot accommodate many vehicles. If the time was extended to 2 hours, or even to 1 hour, it would make conditions worse than they are, as then the first vehicles to occupy the coveted space would most likely remain for the full time limit, thus keeping out others who should not be deprived of the privilege. The shorter time allowance means that more vehicles can be accommodated and consequently more people satisfied.

"Under the conditions as they now exist the board cannot see any way for the time limit for vehicles standing on Tremont and Park streets to be extended. As for prohibiting the standing of express and delivery wagons in the side streets of the shopping districts, it ought not to be seriously considered. Even the people who ask for such a rule would protest if they did not get prompt delivery of their purchases.

"The successful carrying out of the provisions of the traffic regulations depends largely on the police force of the city," the report says. "A strict enforcement of the rules as laid down would be a hardship and inconvenience to business interests. This the board realized when it made the rules.

Police Capable of Acting

"It had faith, however, in the police department and the men who control the congested business district, who would consider the spirit of the rules as well as the letter. The police have met the conditions well. It is remarkable how little complaint there is in the face of the extraordinary conditions the police encounter every day. Doubtless there are countless but technical violations, mostly unintentional, of the rules every day. It would be folly for the police to put men in court for such violations. Indiscriminate prosecutions would lead to the repeal of some of the rules which in general effect are good for the city.

"Because of the traffic regulations the duty of granting permits for the operation of sight-seeing cars has fallen to the board. During the past year it granted permits of this character for the first time. Previously such permits were issued by the police department. The board's authority in the control and operation of these vehicles is very limited, consisting only of naming the places where they may stand and fixing the time during which they stand, and to regulate their operation in streets where they would add to the congestion of traffic. There seems to be no definite law governing their operation, and in the opinion of the board some such law ought to be enacted.

The Sight-Seeing Buses

"Sight-seeing cars have a legitimate place in the life of the city. They appeal to tourists, who, by patronizing them, are enabled to see points of interest cheaply, quickly and comfortably. They appear also to be profitable to those who operate them and there is keen competition for the permits allowing them to be used. There being no law to govern their use, holders of permits operate pretty much as they please, charge such fares as they see fit to establish, and there is little or no responsibility behind them. Some of these sight-seeing cars are bought on the installment plan and are mortgaged to their makers or their agents. In case of injury to persons on the streets or to patrons of them there would be little chance of redress. In the opinion of the board a law ought to be enacted which would permit some municipal authority to regulate their operation, fix fares, exact a bond sufficiently large to guarantee indemnity to persons who might be injured in their operation and requiring them to pay a reasonable fee to the city for the license privilege."

AUSTIN JOINS MAIS FORCES

Indianapolis, Ind., Oct. 21—L. A. Austin who has been the sales manager of the Western Motor Co. and its successor, the Rutenber Motor Co., of Marion, Ind., for some years past, has resigned to become the sales manager of the Mais Motor Truck Co., of Indianapolis. Mr. Austin will enter on his new duties November 1.

Sturmey Scouts the Cheap-Car Story

CHICAGO, Oct. 21—A letter just received by Motor Age from Henry Sturmey, one of the foremost lights in the British motor industry, scouts the story of a proposed $25,000,000 company to build cheap cars to stave off American competition. Mr. Sturmey says:

"I do not know where the New York correspondent of Motor Age gets his information, but he is considerably at sea when, in the issue of September 26, he writes and talks of the formation of a $25,000,000 capitalization here, to compete with the American cheap cars which are coming over in quantities. You can take it from me that there is not $25,000,000 in this country available for any sort of wild-cat scheme which financiers choose to put forward, but the real trouble with the British industry is that adequate capital is lacking for dealing with it as it should be dealt with and the failure of the big combination to make good does not help things any.

"The truth about this story of the $25,000,000 company, to meet American competition, is that one of our halfpenny papers—what you would term the yellow press over there—got its hair off over the success of the Ford and beat the big drum on the decline of British industry and the American sweeping the board. One or two of our impressionables here in the trade, who were out for a bit of self advertisement as much as anything else, played up to them, with the result that the paper gave a swagger invitation dinner to the trade to discuss things. None of the representative British houses took the trouble to go, but a few others attended the dinner and talked, and the talk was around a wholly impracticable proposal of William Letts—of whom you know a little—for a combination of British firms, to make a cheap car, and another suggestion was that a $2,500,000 and not $25,000,000 independent company might be formed for the purpose.

"The general result of the discussion was a beating of thin air. Both suggestions were turned down as unworkable, and, having digested the newspaper's good dinner, the crowd went home. I think you can leave it at that. Our manufacturers of class cars are not tumbling over themselves to get into the cheap trade any more than are the Peerless, Packard, Pierce-Arrow and other makers on your side who are making similar class machines."

Milwaukee Deficit Placed at $43,000

Management, However, Wants 1913 Road Races—Moross Asks Big Expense Account

MILWAUKEE, WIS., Oct. 22—The M. A. D. A. lost approximately $43,000 on the road races, and its officers regret deeply that the association's poor position should be taken advantage of by two of the participants, Bragg being one and Ernie Moross being the other. Moross late last week filed a claim for expenses for 14 days for himself, Burman, Horan, Decourcey and Toney, but payment was immediately refused because the Moross team was not in Milwaukee anywhere near 14 days, but was playing 1-day stands in Pittsburgh, St. Louis and other cities during the time it intends to charge for expenses at Milwaukee. Bragg objects to paying the rest of his entry fee, $875, claiming Bruce-Brown paid nothing. Therefore his $5,000 prize is held up by the dealers' association.

Moross also filed a protest against the award of fifth place in the grand prix to George Clark's Mercedes, because he claims Burman was running as well as Clark when the race was called off. It develops from this claim that no fifth place was awarded, Referee A. R. Pardington having placed only four cars which actually finished the race. The M. A. D. A. did, however, make a gift of $500, equal to the fifth place prize, to Clark, who was 40 miles ahead of Burman when the race was called to run no risk of life and limb due to the crowding of the course at the place of de Palma's mishap.

The expenses of the meet were approximately $118,000 and the total receipts only $75,000. While no financial statement will be issued to the public, for the reason that the affair is a private matter of the association, it is stated that the principal expense was the construction of the course, upon which $55,000 was expended. The prize list amounted to $20,500, which added to the road expense equals the total revenue.

A garnishee of about $375 placed on the bank account of the M. A. D. A. several days after the races has caused considerable inconvenience, but President Isaac G. Hickman says he is confident that this will be only temporary and the embargo will be lifted before the end of the week. The garnishee served to delay payment of a number of checks, among them that of Starter Fred J. Wagner, whom Manager Ruddle wired on Friday to be patient until early this week, when the matter will be cleared up.

"No one will lose a cent, though our deficit is enormous," said Manager Ruddle. "We are going to pay penny for penny and, what is more, we are going to have the international cup races in Milwaukee in 1913. The matter of financing the deficit is well under way and it will be a matter of only a week or so before we will be able to liquidate every debt contracted legally."

Manager Ruddle will go to New York late this or early next week to make preliminary arrangements for the running of the big cup races on the Wauwatosa course next summer.

President Hickman, Treasurer Jonas, who is chairman of the racing board, and Manager Ruddle believe the Motor Cups Holding Co. will award the races to Milwaukee for 1913 on the showing made this year. They say the matter of a deficit, which is being properly cared for should have nothing to do with the award, if proper guarantees are again forthcoming—and this they will. There has been no criticism of the policing, a principal consideration. The course, upon which $55,000 was expended, needs only a small expenditure to make it good and proper for more racing. Ten thousand dollars will do wonders with the present Wauwatosa course.

Outside of the expenditure of $10,000 by the M. A. D. A. for improving the course for next year, it must be remembered that Milwaukee county will put $60,000 into one road forming the course early in the spring. This work will consist of paving the North Fond du Lac road from the city limits to the Town line road with concrete, having a roadbed of 25 feet. The work will be started April 1 at the latest and be ready by June 15 or July 1.

SPEEDWAY FOR DALLAS

Dallas, Tex., Oct. 19—If the plans of John S. Prince are carried out, Dallas will within the next 3 months have a speedway. Mr. Prince was before the Dallas Automobile Club this week and presented his plans for building the speedway, declaring that he would build one which could easily take a race of 120 miles per hour. The formal plans have not yet been agreed upon but it is probable that some definite action will be taken next week.

Prince's plans call for a board speedway 1½-mile in circumference, with the turns banked 40 degrees on the common half-circle. Coming out of the common half-circle, the cars will swing into Prince's famous triple radius, then the banking will slope away to 10 degrees into the stretch. The two stretches will measure 1,800 feet each and the diameter will be 1,500 feet. The grandstand will be 1,500 feet in length; there will be 200 boxes and two subways. Prince expects to have the speedway completed in time for a meet Christmas week.

A committee composed of C. H. Verschoyle, Eli Sanger, William McLean, D. D. Ostott, Otto Lang and W. H. Bertrand has been named by the club to arrange with Mr. Prince the details of the speedway.

ALL-CANADIAN RUN COMPLETED

Victoria, B. C., Oct. 19—Thomas W. Wilby and F. V. Haney, the two transcontinental motorists who left Halifax, N. S., August 27 in a Reo, arrived here October 16. This completes the first cross-continent motor trip via an all-Canadian route ever made.

Wilby and Haney left Halifax, Nova Scotia, on August 27 for Victoria, B. C., in search of an all-Canadian highway from coast to coast. Their route lay via Truro, Nova Scotia; Moncton, N. B.; St. John, Fredericton, Reviere-de-Loup, Quebec, Three Rivers, Montreal, Ottawa, Belleville, Toronto, Sudbury, Sault Ste. Marie, Port Arthur, Bat Portage, Winnipeg, Brandon, Regina, Medicine Hat, Alberta, Calgary, from thence to Nelson and Victoria, B. C.

MILWAUKEE OFFICERS RE-ELECTED

Milwaukee, Wis., Oct. 21—Lee A. Dearholt, president; Frederick Gettelman, second vice-president, and Leonard E. Meyer, secretary, were re-elected to these positions at the annual meeting of the Milwaukee Automobile Club on October 18. Orrin E. Grovier, who has been chairman of the house committee for the past year, was elected first vice-president, and William H. Raymond, president of the Wisconsin State A. A., was elected treasurer. New directors elected were William E. Haefner and Russell R. Johnstone. Reports of the officers showed that 154 new members were elected during the past year, giving a present membership of 600, which is considered excellent in view of the fact that 131 members resigned because the dues were raised a year ago.

LAW NOT RETROACTIVE

Baltimore, Md., Oct. 20—Judge Duncan in the circuit court of Baltimore county has handed down an opinion that persons under 18 years of age who had obtained licenses to operate motor cars under acts of the legislature previous to 1912 cannot be prohibited from operating cars under the provisions of the act of 1912. The rest of the act is held valid. This opinion was rendered as a result of a test case made by the Automobile Club of Maryland. John T. Sadler, defendant in the case, secured his operator's license before the act of 1912 and was adjudged not guilty. He was arrested for running a motor car while under 18 years of age and was convicted and fined by a justice of the peace. It was this case in which an appeal was filed.

Racing Outlook on Other Side of Atlantic

PARIS, Oct. 11—In addition to the usual short distance races, the organizers of the Ostend meeting will next year hold a long-distance race under the fuel consumption rules of the Automobile Club of France, these calling for practically 14 miles to the gallon. The meeting will occupy 4 days, on the first of which will be run the 500 miles Grand Prix d'Ostende, with prizes of $6,000, $3,000, and $1,000. On the second day there will be a 20-kilometers race on the Royal road; on the third day kilometer tests will be held; and on the fourth day the Liedekerke, Williams, Vanderlinden and Ostend cups will be competed for.

Entries are coming in slowly for the French grand prix race scheduled for the end of June or early July. In order that this race shall be held forty paid entries must be in the hands of the racing board not later than the last day of October. Up to the present only eight cars have been received, being three Peugeots, three Sunbeams and two Delages. It was generally believed that the minimum number of forty would be attained without much difficulty, but in view of the delay in sending entries fears are expressed that the race will have to be dropped. The time of closing has been most inconveniently selected, for during the period immediately preceding the opening of the London and Paris shows the manufacturers are not disposed to come to a decision regarding their racing program for the season of 1913.

Should the grand prix have to be taken off the cards, France will still have a big race in the 5-liter long-distance speed event to be organized by L'Auto. The first race of this nature was held at Boulogne in 1911, replacing the long-series of limited bore voiturette races; then the idea was taken up by the Automobile Club of France in its grand prix at Dieppe, and will again be repeated by L'Auto for 1913. Entries for this race close in the spring. It is known that the leading light-car manufacturers will take part, and Peugeot, among others, already has made arrangements to run in both the Automobile Club Grand Prix and L'Auto 3-liter event. The 3 liter race will be held for the last time in 1913, it being considered that 3 years' experience are quite sufficient to get all possible benefits out of one set of rules. The 1914 race will be under fuel consumption rules of the Automobile Club of France, known as the grand prix.

French Announce Big Reliability

Fifteen-Day 3,000-Mile Run Set for 1913—Price Limit on Contesting Cars Is $1600

PARIS, Oct. 12—With bonnets nailed down and all essential parts sealed, medium-powered French cars having a chasis prices of not more than $1,600 will take part in a 15-day 3,000-mile endurance test round France next March.

It is believed that the maintenance of all the seals intact for 15 consecutive days will not serve to prove the greater worth of the cars, while it will prevent the drivers giving those daily attentions necessary for any piece of mechanism, and which owners are quite willing to give at the beginning of a day's run. On this account the front and rear axles and the steering gear will be permanently sealed. The bonnet, the radiator filler cap, the under pan and the footboards giving access to the clutch and gearbox can have their seals broken for 10 minutes only every morning. At the expiration of this time the seals will be replaced and cannot be broken without the loss of points.

The arrangement will allow drivers to screw down grease cups, verify their motors, fill the tanks and make slight adjustments, but the time will not be long enough to make any repairs. The breakage of the radiator filler cap will entail a loss of 2 points; if the underpan or the footboard seals are removed, 3 points will be deducted for each; the lifting of the bonnet will cause a loss of 4 points. If the permanent seals are lost the car will be eliminated, and failure to maintain an average of 18½ miles an hour on any of the stages will also entail disqualification.

The competitors will start from Paris on March 1 and make a loop round France, the daily runs averaging about 160 miles. Although 18½ miles an hour is the minimum speed, it is no indication of the speed that will be maintained, for all such work on the car as filling tanks, changing tires, as well as stoppages for meals, will have to be carried out during the running time. The circuit will comprise every class of road, with a considerable amount of mountain climbing in the Pyrenees and the Alps.

With a $1,600 limit, the whole of the popular medium-powered cars will be admitted. The limit has been fixed on the chassis instead of the complete car because of the wide difference in body value on this type of European chassis. In all cases the competing cars must be completely equipped touring models having not fewer than two seats, with hood, windscreen, horn, running boards, lamps, headlights, etc. Numerous entries have already been received for the tour.

To Build a Motor Bob

Small Home-Made Car to Use Motorcycle Engine Designed for Texas Boy

ACME, Tex.—Editor Motor Age—Do you think a motor bob would be practical with a 6 or 7-horsepower engine, and about what ratio would be best? About what speed would it give? Would it give 18 or 20 miles per hour, and would it have power enough to take a boy weighing about 85 pounds over fairly good roads? What would the motor cost, and where could I get one? I want it to go to school in. I have about 6 miles to go every morning.—A. B. Newby.

Motor bobs are not usually made with as much power as this, from 2½ to 4 horsepower being considered ample for the limitations of the chassis. A gear ratio of less than 7 to 1 is not to be advised. This would probably be sufficient to give you better than 20 miles per hour, which is faster than safety would permit. In all probability you could carry a load of 200 or 300 pounds with a good engine of this power, in a well constructed chassis. Motor Age is not in a position to give definite information on the cost of a motor of this type, and refers the writer to its classified columns.

The construction of a motor bob is no small undertaking, and as mistakes in design would prove very costly, Motor Age submits the following sketches and specifications. These are of course only tentative, and subject to modification in detail to adapt the design to available materials.

The design shown in Figs. 1, 2, 3, and 4, is for a light home-made cycle car, made, as near as possible throughout of standard hardware and plumbing fixtures. The wheelbase is short and the tread narrow, which permits of great strength with little weight. The motor should be of light weight. A standard motorcycle engine is best adapted to this use. It is situated to the rear of the back axle, and drives to the wheels through a chain-driven countershaft, and from thence by belts. The frame and axles are of standard 2-inch malleable pipe, and standard malleable unions. The front axle is rigid, and steers on a pivot. The wheels are 28-inch motorcycle wheels, with pneumatic tires. The frame is underslung, which not only saves complication, but greatly enhances the ease of riding, and is almost indispensable to safety, with a machine of this character. The springs are half-elliptic, being halves of old elliptic carriage springs.

The frame should be drawn to scale before the purchase of the material, and the latter ordered cut and threaded from the dealer. This type of frame will be found very strong and substantial, and will easily support a thousand pounds, or more than the wheels, and may safely carry a 500 pound load. Its weight, assembled, will be about 160 pounds, and the pipe may be purchased, cut and threaded to specification for about 15 cents per foot, while the unions, threaded to fit, will cost about the same each. A pipe frame is the cheapest and easiest frame to construct, quality considered, that can be found, and will be immune to vibration. The frame should be of 2-inch pipe throughout.

The axles are of 1-inch pipe, the wheel spindles being welded or brazed to them by a blacksmith. The front axle pivot is shown in Fig. 4, detail A. Especial attention is called to the radius rod which extends from the front cross member of the frame to the top plate of the axle. This is indispensable, as with the type of steering used, the axle must be kept rigid. This rod and the plates, which any blacksmith will make at a nominal cost, are the only special parts to be made, the rest of the assembly consisting of a standard pipe hanger, and U-bolts. The short front cross spring, is made by cutting down a half-elliptic spring, obtained from an old elliptic carriage spring. It should be rather stiff.

No motor suspension is outlined in the drawings, as this detail must depend entirely upon the motor used. A good frame that will absorb a large part of the vibration is made of two pieces of 2 by 4-inch oak, secured to the pipe frame by U-bolts, with washers, next the wood. The countershaft is supported on the elevated bearings as shown in Fig. 4, C. These bearings consist of 2-inch Ts, bushed with cast babbit on the inside. In casting them, cores should be used, as shown in detail B, of Fig. 4, to save metal. When cast they should be reamed to exact size, to receive the countershaft. The countershaft presents a strictly machine-shop job, and should be made of a good grade of carbon steel 1 inch in size. The sheaves are keyed to the ends of the shaft, and the sprocket should be bolted to flanges keyed to the shaft. A pair of floor flanges will be found adaptable. The inner bearings are for the purpose of supporting the shaft and the outside bearings, are secured to the radius tubes. Belt pulleys may be procured of any motorcycle parts dealer and keyed to the shaft by a machinist. The belt is tightened or loosened to obtain a free engine drive. For this purpose, a pair of jockey pulleys are mounted on the upper stretch of the belt. This is the reverse of motorcycle practice, because the

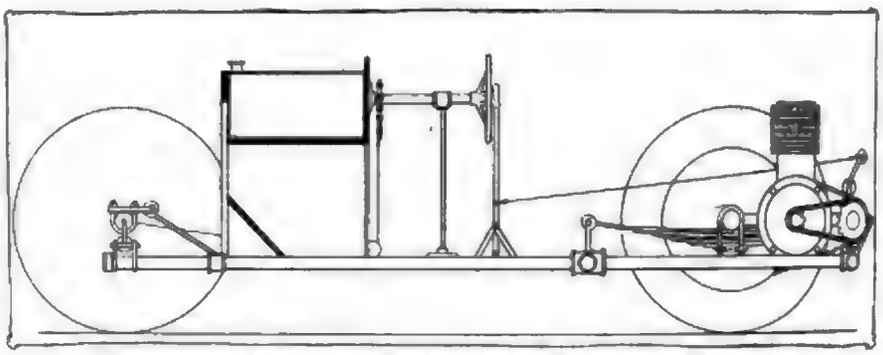


FIG. 1—SIDE SECTIONAL ELEVATION OF PIPE-FRAME CHASSIS

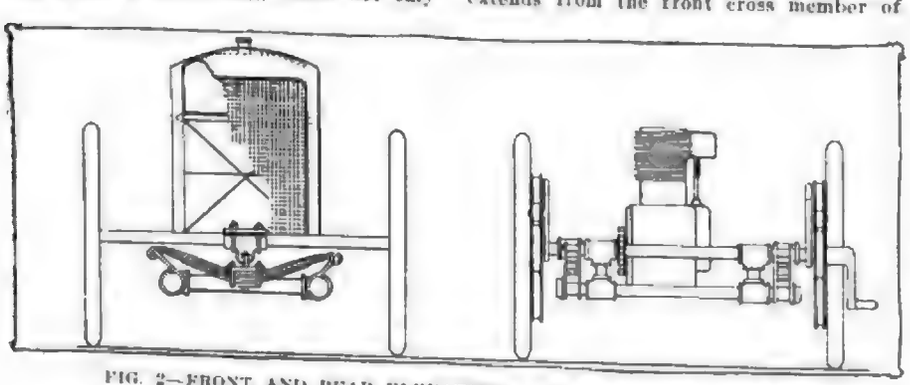


FIG. 2—FRONT AND REAR ELEVATIONS OF HOME-MADE CYCLE CAR

The Readers

Simple Cycle-Car Design—Fiat Fuel Feed—Speed of Chadwick at Jericho—Buick Adjustments and Lubrication—Milwaukee Makers of Tire Fillers

Clearing House

More Discussion of Cause of Motor Rocking with Unusal Crank Arrangement—Do Not Recharge Ford Magnets—Minnesota Motorist Is Maligned

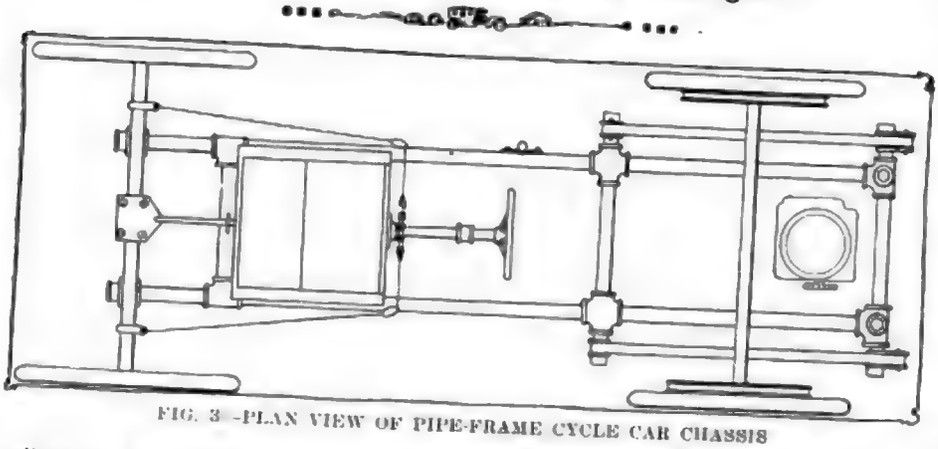


FIG. 3—PLAN VIEW OF PIPE-FRAME CYCLE CAR CHASSIS

pull side of the belt is on the lower side, due to the rear position of the countershaft. The brake should be in the form of a pair of faced shoes, to bear on the wheel sheaves, and connected by a small pipe or rod, across the car. The control of the jockey pulleys, and the brake is by rods or cables leading forward to levers or pedals, convenient to the reach of the driver. The most convenient and the simplest method would be to connect these cables on opposite sides of the pivot of a side-lever, so that when pushed forward, the belts are tightened, and when pulled backward, the brakes are set. Just enough slack should be allowed in the linkage to make the action of the lever neutral in the central position, so that neither cable is under tension.

Spark and throttle control may be most conveniently placed on the cowl dash, according to the latest 1913 fashion. The connections here will be simple and direct, and if the cowl is carried far enough back, will be within reach of the driver's hand. The crank should be fitted to the end of the countershaft, which should be arranged at the machine shop to receive it. The steering can best be managed with a horizontal steering pillar, with a hand wheel, the action being through a chain and sprocket, terminating in cables, attached to the front axle.

In this description, nothing has been said regarding the body. The best type of body to use is a sheet-metal flush-side type, as with a car as near the ground as this, protection from the mud of the road is indispensable. Available materials, and the individual preferences of the builder will have to dictate the style of body used, which may be made as simple or as elaborate as desired. It will be found convenient, however to carry the gasoline tank in the front, if possible, incorporating it with a dummy radiator, for the sake of appearance. The motor should not be covered, as to do so will impair its cooling.

The trimming and finish of the car can be made as simple or elaborate as the tastes and resources of the builder may dictate. Perforated sheet brass may be used to imitate the radiator.

RECHARGING FORD MAGNETS

Rockford, Ill.—Editor Motor Age—I would like some detailed information for making a simple device with which I could recharge the magnets of a model T Ford magneto without dismounting the magnets from the flywheel. I can use either storage batteries or 110-volt circuit, but am not clear as to the details of such a device.—Constant Reader.

Motor Age would not advise home charging of the magnets of the Ford magneto, except by an expert with a very complete equipment for such charging. The best plan, and probably the cheapest, would be to return them to your local factory branch or hire it done elsewhere. The Ford company does not advise recharging the magnets, for they do not hold their magnetism long after recharging, and new ones can be obtained at low cost.

Concerning Crank-Angle

More Comment on Cause of Bad Running Balance with Progressive Firing

SAINT ANSGAR, Iowa—Editor Motor Age—Replying to your reply to Chauffeur in Motor Age, October 3, regarding the angularity of cranks, it would seem that this subject is not as well understood as it should be by motorists in general, and I have seen statements by at least one manufacturer, which would tend to prove that he was not aware of the facts at the time of his writing, but later stated it was due to an oversight, when I called his attention to the matter.

The manufacturer who stated that the difficulty with motors which fire 1-2-3-4 was due to lack of balance of the moving parts instead of the firing order was right. Any one can prove this to his own satisfaction by bending a fairly heavy rod in the shape of two cranks with a bearing between them as in Fig. 5. Make the bearing long enough to have a grip with the hand, and leave the cranks about a foot in length, and of the same weight, so as to give a perfect standing balance. By rotating the rod rapidly, an effect will be produced exactly as represented by Fig. 3 in the article referred to. To carry the experiment further, make another form like the modern four cylinder, three bearing crank-shaft, and note that it will run rapidly without a couple.

Motor Age says that "By so designing the crankshaft that the firing order is more evenly distributed, the pressure is balanced, each alternate explosion bringing its pressure to bear on a different portion of the motor, instead of two explosions occurring at one end of the motor, and then two more at the opposite end." There are but two ways to fire the balanced motor, 1-2-4-3, and 1-3-4-2, and in both cases two explosions occur at one end of the motor and then two more at the other end. In the first, 2 follows 1 and 3 follows 4. In the last, 4 follows 3, and 1 follows 2.

A four-cylinder balanced motor, flexibly mounted in the frame, as the 1908 Franklin G. will show a vibration somewhat similar to a couple, except that the vibration is purely vertical, and is due to the two causes, viz.; action and reaction being equal, an explosion between the piston head and cylinder, will lift the cylinder

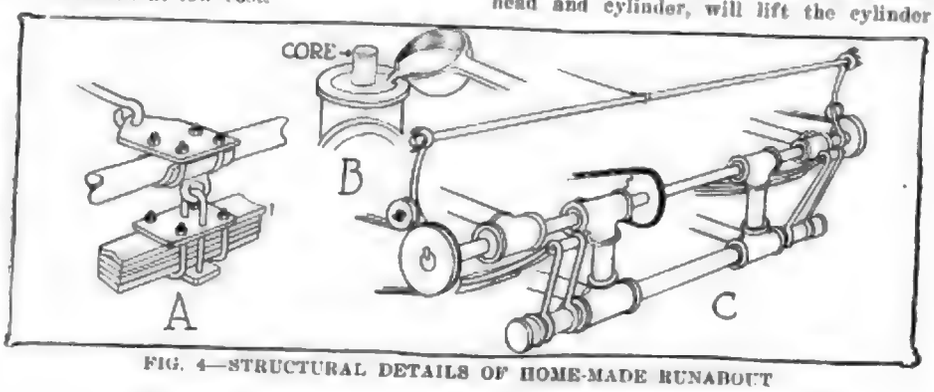


FIG. 4—STRUCTURAL DETAILS OF HOME-MADE RUNABOUT

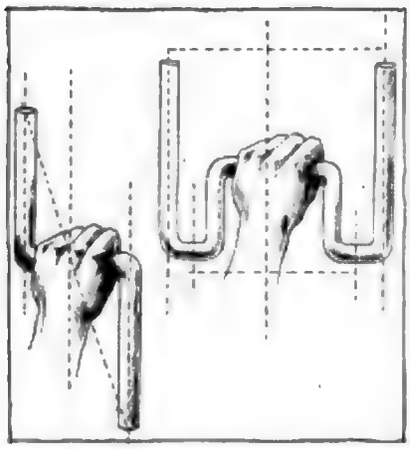


FIG. 5—CARROLL'S DEMONSTRATION OF CRANK-BALANCE

as well as force the piston down, due to the not very great difference between the two masses of metal. The front end has more movement than the rear, as the flywheel at the latter end, though revolving, adds its own weight to the relatively inert mass.

If a motor were made with two flywheels of equal weight, and placed equal distances from the ends of the cylinders, there would be a certain amount of vibration, based on the relative weights of the reciprocating and stationary masses, but it would be entirely vertical aside from the engine reaction, there being no remaining cause for a couple. It is an impossibility to build a vertical, four-cylinder balanced motor, and have it fire 1-2-3-4.—Guy B. Carroll.

As was discussed last week, a crankshaft arranged for progressive firing is very much out of running balance, due, as was then explained, to the different paths of centrifugal throw, of the cranks so arranged. The phantom lines which have been added to Mr. Carrol's figures show this tendency. The paths of centrifugal throw of the first, do not coincide nor balance, while those of the second are evenly balanced. This is conceded as a contributing factor to the imperfect balance of a progressive firing motor. That it is the principal cause of this condition, has not been proven.

In regard to consecutive firing of adjacent cylinders, Mr. Carroll's statement that in a standard motor this condition exists, is correct, but the effect differs from that of a progressive firing order, for the following reasons: the explosions in an alternate-crank motor occur in a progressive sequence, each explosion occuring in the next adjacent cylinder until the last cylinder is reached, when a jump is made back to the first cylinder. The effect on the crankshaft is that the power thrust is received in waves along its length without a break, with the tendency of violent tetering. In a standard motor, each revolution sees a jump from one cylinder to the second adjacent, so that on the first cylinder being fired, there is a jump to the third, which is followed by an explosion from the fourth. Instead of jumping back to the first from here, the next explosion occurs in number two cylinder, followed by number one.

It was stated in the criticism by Mr. Fried, which appeared in last week's issue, that a two-cycle four-cylinder crankshaft is always out running of balance. Analogous to this type of crank arrangement, is the crank action of the familiar locomotive. This crank arrangement is exactly like that of the two-cycle engine, except that as the steam cylinder is double-acting, one crank performs the function of two in the single-acting two-cycle engine. Such a crank arrangement is very much out of static balance as well as running balance, but is compensated for by the counterweights on the opposite portion of the drivewheels. Such a counter-balancing, if applied to the alternate-throw crankshaft would remove the lack of running balance, but would not balance the engine, as the wave-like application of power of consecutive firing would throw a motor out of balance, though it had the most perfectly balanced crankshaft possible. This difference is illustrated in Fig. 7.

In regard to Mr. Carroll's statement concerning flywheels, that the addition of a flywheel in front of the motor, at an equal distance from the motor as the rear flywheel, would augment any vibratory tendency, Motor Age must request that he make himself clear on this point. The effect of additional centrifugal inertia, would seem to have the tendency of decreasing the irregularities of the motor's balance. The gyroscopic action of an additional flywheel, would also exert an important influence in preventing the longitudinal rocking of the motor.

CHADWICK SPEED

Atlanta, Ga.—Editor Motor Age—The Chadwick people claim that one of their stock six runabouts, stripped, attained the speed of 112 miles an hour on the Jericho turnpike, a part of the old Vanderbilt cup course. Is this time recognized by the contest board of the A.A.A.?

2—Motor Age's foreign correspondent, in his description of the last French grand prix, states that the Bruce-Brown Fiat had a combined pressure and gravity feed system, which enabled the fuel supply to be replenished while the motor was running. Will Motor Age describe this?

3—Would like Willie Haupt's complete racing records? Also, his present employment and place of residence?

4—Who is the present amateur champion?—J. N. Brightwell.

1—There is no official record of it.

2—This system, shown in Fig. 6, of last week's issue, consisted of a pressure system pure and simple, the tank of which was located higher than the float chamber of the carbureter, so that, with the filler cap off in refilling, the gasoline would still feed to the carbureter, which prevents the motor from stopping while the tanks are being filled, thus saving much valuable time. This is used generally.

3—Willie Haupt's best work was done at Wilkes-Barre, Pa., in the hill climb up Giant's Despair hill. He has not raced since 1909.

4—There is none.

CARE OF THE BUICK

Cleveland, Minn.—Editor Motor Age—I am driving a Buick model 43, 1912. What is the actual brake horsepower of the motor in this car?

2—What is the gear ratio?

3—What is the speed claimed for this car?

4—How is the steering gear adjusted to take up slack in the steering wheel?

5—What is the small plate for that is on the top of the driveshaft housing, just in front of the rear axle?

6—How often should the gearset and differential in this car be filled with grease? How much and what kind of grease should be used?

7—Is the Buick Motor Co. going to build a six for 1913?—A Subscriber.

1—35 horsepower at 1,000 revolutions per minute, and 49 horsepower at 1,500.

2—3½ to 1 on high gear.

3—60 miles per hour, with touring equipment.

4—Fig. 9 shows the Buick steering gear. Lost motion is taken up by turning nut A to the right. This draws down the upper thrust bearing onto the flange on the worm shaft, to take up wear.

5—The small plate to which you refer is for the purpose of packing the differential drive-pinion in grease.

6—Grease is put into the differential about once in 5,000 miles of running, or

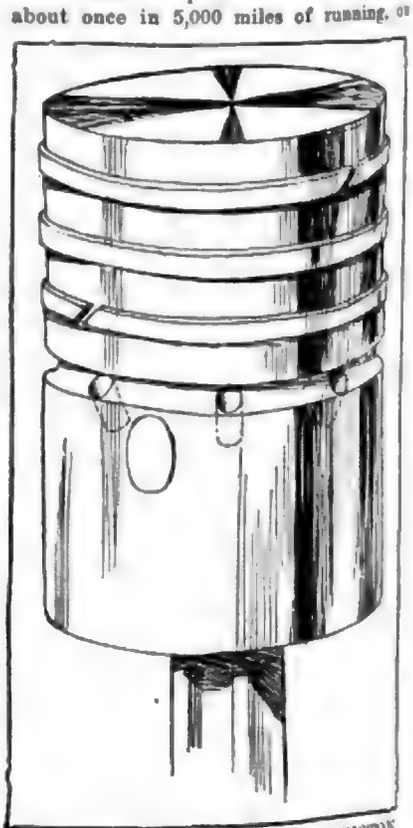


FIG. 6—OIL DRAINS IN BUICK PISTON

the average. It should be filled up to the overflow plug. This will be found to require from 3 to 5 pounds. The gearset is not packed in grease, but cylinder oil is put in to a height about even with the countershaft. This requires about 3 quarts of oil. The Buick company recommends cup grease for the differential and drive-pinion.

7—No announcement to this effect has been made.

BIG WHEELS ON FORD

LaGrange, Mo.—Editor Motor Age—Kindly inform me why a Ford model T cannot successfully be changed from 30 by 3½ to 32 by 3½-inch tires all around?

2—I would like the addresses of firms in Minneapolis, and Milwaukee, Wis., who manufacture a tire filler to replace the inner tube of tires.—W. C. O'Neal.

1—There is no reason why this change cannot be made, although it would not be wise under ordinary circumstances. The Ford car is intended to use 30 by 3½-inch tires, and every component part is especially designed for this size of tire. An increase of tire size would in the first place increase the gear ratio, so that the car would either be too highly geared, or else changes would have to be made in the gearing. These changes would be difficult, as the Ford rear axle is not designed for optional gears. The increase of the tire diameter by 2 inches would raise the car 1 inch in the air. This would lessen its stability, and prove rather awkward. The rear tire on its upper surface, and at the running board, would not more than just clear the mudguard. The wheels would not cramp so far in steering. Worse than any of these, however, the axles would be subjected to additional strains in rounding curves, and running on the down side of the road that would exceed the limit for which they were designed. This is illustrated in Fig. 8. The Ford design has been highly organized, and admits of very little change in structural features.

2—The Dahl tire filler is manufactured in Minneapolis, and is handled at a Milwaukee branch. Chemical rubber is manufactured at 322 East North avenue, Milwaukee.

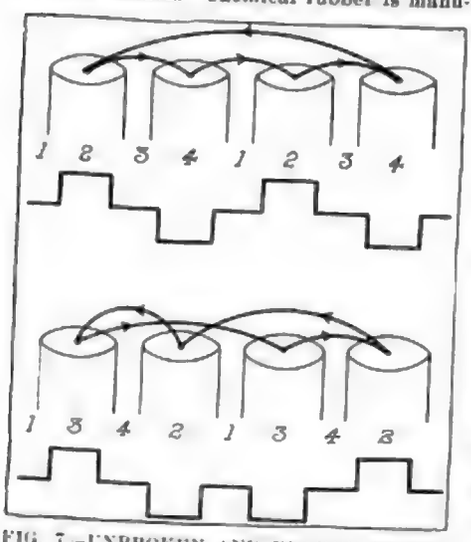


FIG. 7—UNBROKEN AND BROKEN FIRING SEQUENCE

CARPENTER CRITICISED

Buffalo, Minn.—Editor Motor Age—I noticed in the issue of September 26 that A. D. Carpenter thinks the reversible steering gear is the best all around type to have in a car. I have had experience with different kinds and I think the irreversible type is by far the best, the easiest to steer, and the safest. Mr. Carpenter says to turn a car with the irreversible gear one must exert a considerable power in order to turn the car as desired, and that it is much slower.

It seems to me that his irreversible must have been binding somewhere along the line. Now all modern reversible steering gears are back-geared to a more or less degree. If it were not it would be hard to hold onto a car going over rough roads. That the irreversible is slower in action shows that it is back-geared more than the reversible and the back-gearing gives one more purchase on the front wheels and makes it steer easier.

I think the irreversible is not very complicated. The better grades are exceedingly well built, the worm and sector devices inclosed in an oil-tight housing with an eccentric bushing to take up play between the worm and sector, and thrust bearing to take up the end play of the worm. Large and heavy cars frequently employ the reversible. The reversible is exceedingly cheap to make. I think any mechanic will agree with me on that point, and it is put on low-priced cars for the simple reason that in this day of fierce competition builders cheapen production in order to sell their wares.

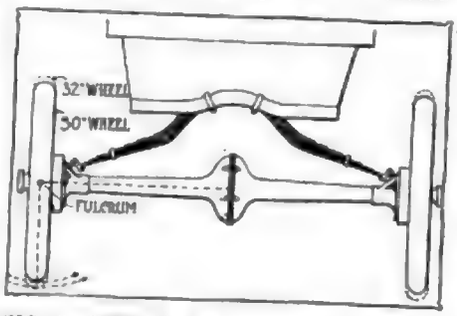


FIG. 8—EFFECT ON AXLE OF LARGER WHEELS

And, then, on the other hand there is real satisfaction in having an irreversible steering gear because one knows that one can take the hands off of the wheel for a second, if one so desires, without running into a ditch or a telephone pole. Should, perchance, a dog get in the way of the front wheels, one would have to hang on for dear life to keep the steering wheel from jerking away. Not so with the irreversible. One can scarcely feel it on the wheel. You will not find irreversible steering gears on cheap cars; the makers do not use them, for they are too expensive.

I think one should not compare the bicycle or motor cycle's easy steering qualities with those of a motor car, for the reason that the former have not the weight, and where there is no weight no effort is required to move the wheel or wheels. On a bicycle there is but one wheel to move and that is centrally disposed; on a motor car there are the front wheel offset from 3 to 4 inches from the king bolts. One might say that since both front wheels are offset, one balances the other, which is true. But let one front wheel meet with more resistance than the other and instantly this equilibrium is disturbed and there is a jerk at the reversible steering wheel, whereas on the irreversible this is entirely eliminated.—P. G. Liederbach.

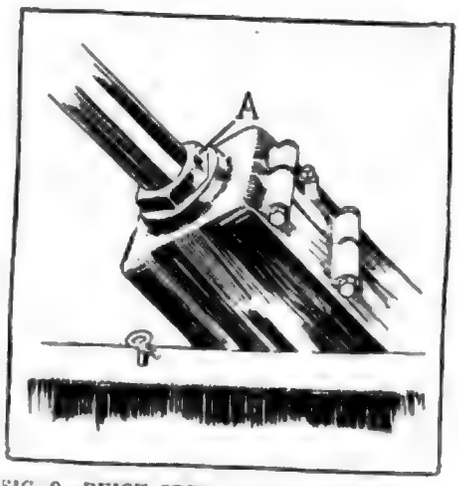


FIG. 9—BUICK STEERING ADJUSTMENT

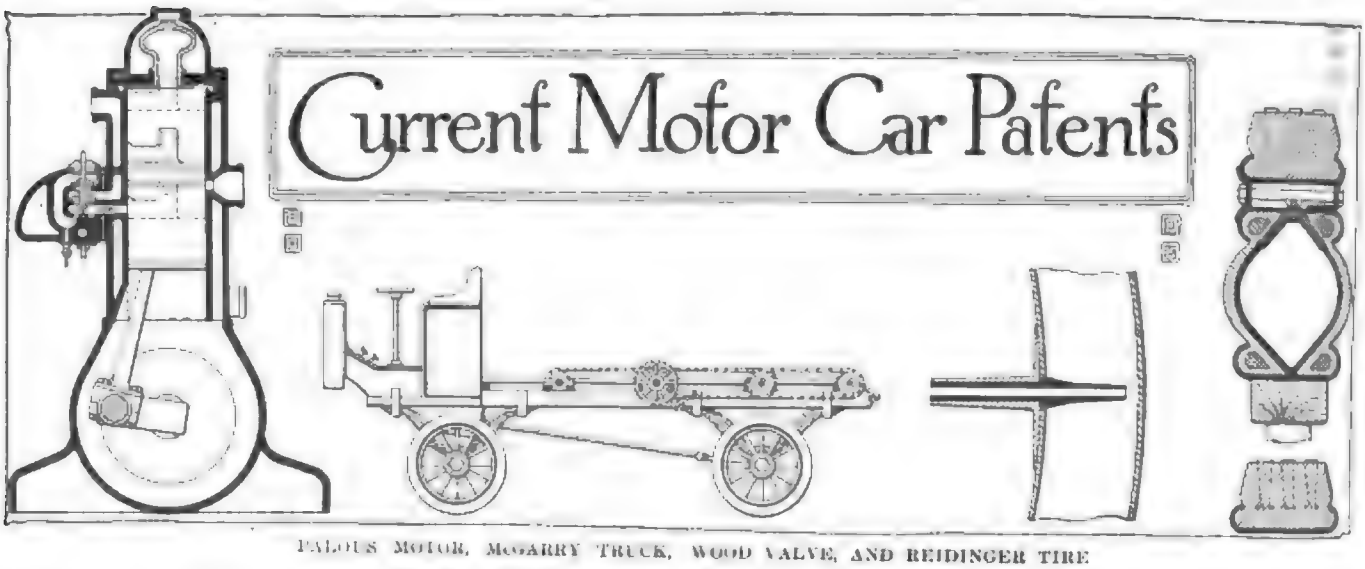
DRILLING PISTONS

Elma, Wis.—Editor Motor Age—In Motor Age, September 19, 1912, in the repair shop department there was published an item regarding drilling piston drains. Has this been tried out? Does Motor Age think it would be a good plan to drill the holes slanting down towards the inside?

2—About how many ¼-inch holes should one put in a piston on a 1908 model 10 Buick? The compression is good and I use Monogram heavy oil.—John Leybold.

1—Clamps such as described in the article to which you refer are not new, and are used successfully to hold cylindrical stock under the drill press where a simple efficient clamp is to be gotten up quickly for temporary jobs in practically all repair shops. Motor Age does not know of any specific case where they have been used for drilling pistons, as this job is a rare one, but can assure you that it will hold pistons as securely as any other cylinder.

2—The model 10 Buick should be drilled to drain oil as in Fig. 6. The holes in this case need not be more than ⅛-inch in size and about eight in number. The groove should be turned in a lathe, to facilitate the collection of oil, the holes being drilled through it at a downward angle. This is permissible with such small holes as specified, although if a ¼-inch drill is used, they should be slanted little, to facilitate the draining of oil.



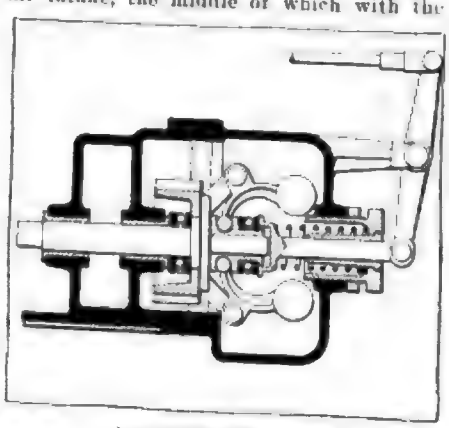
PALOUS MOTOR, McGARRY TRUCK, WOOD VALVE, AND REIDINGER TIRE

PACKARD Governor—No. 1,041,643—To Vincent Link, assignor, by mesne assignments to Packard Motor Car Co., Detroit, Mich. Filed June 9, 1908, dated October 15, 1912. This governor is to prevent the overspeeding of a truck, and is so constructed that it may be sealed by the manufacturers, in adjustment for a certain maximum speed, which the car cannot exceed unless the seals are broken, and the adjustment changed. It consists of a pair of revolving ball weights, secured to pivoted arms, the pivots of which are secured to a pair of levers which revolve with the shaft on which the governor is mounted. The inner portions of the arms are in the form of prongs, engaging with slots in a sliding sleeve about the shaft. Upon the balls being impelled outward in rotation, by centrifugal force, this sleeve is moved along the shaft by these prongs. Its movement is resisted by a spring which bears against a forked non-revolving shaft, which in turn bears on the end of the sleeve through a ball thrust bearing. This shaft is connected by a walking beam to the throttle of the engine, so that when the maximum speed is reached, and the balls are revolving in their widest path, the throttle is partially closed, so as to make further speed impossible.

Lumber Truck—No. 1,041,319—To John A. McGarry, Chicago, Ill. Filed January 11, 1911, dated October 15, 1912. To facilitate loading and unloading of lumber on a motor truck, this device consists of a number of transverse rollers on the loading platform, which are revolved by chains and sprockets, engine driven. Their direction of rotation is reversible, so that the load may either be moved forward in loading, or backward, in unloading.

English Punctureless Pneumatic—No. 1,041,350—To Eugene Richard Reidinger, London, England, assignor of one-half to Andrew Fraser, London, England. Filed July 2, 1912, dated October 15, 1912. The principle upon which this tire operates is the same as similar inventions in this country. The difference is that most of the American solid-pneumatic combinations allow the solid or tread element a certain amount of deformation. On the Reidinger tire, however, the tread is secured to a solid steel demountable rim, and has no provision for encompassing road obstacles, but must roll over them. The pneumatic element is disposed between this rim and the felloe of the wheel. It consists of an outer shoe of a double-tube inflatable pneumatic cushion, which instead of having a tread at its outer periphery, is provided with a clincher bead, identical, except as to size with the inner bead. Clincher rims hold the tire on both beads. This construction makes the tire very substantial, thus removing an objection that has heretofore obtained to this type of tire. The treads are removable.

German Two-Cycle Motor—No. 1,041,154—To Leon Palous, Berlin, Germany. Filed Dec. 26, 1911, dated October 15, 1912. Integral with the cylinder, the mixer of carbureter of this engine is its feature. The engine is of the single-bore, crankcase compression type, with the inlet and exhaust valves situated on opposite sides of the cylinder, uncovered by the piston at the lower portion of its down stroke. The inlet is through a passage in the piston, and out through a vertical nozzle. The mixer consists of three valve chambers, the upper of which communicates with the air intake, the middle of which with the compression space, and the lower, with the inlet port in the cylinder. The valve is situated in the middle chamber, adapted to alternately close the upper and lower chamber from communication therewith. The lower portion of its stem terminates in a needle valve, seating in a fuel nozzle. On the down stroke of the piston, the air in the crankcase is compressed. At the bottom of the stroke, the intake valve is uncovered, permitting the air to pass through the valve from the middle chamber into the lower. The raising of the valve, raises the needle valve, and allows a spray of fuel to mix with the inrushing air. On the upstroke of the piston, a suction is created in the crankcase, and the valve closes the opening into the lower chamber, admitting air from the upper chamber through the middle chamber into the crankcase. The advantages to be gained by this valve construction are, crankcase compression, without condensation of the charge, as only pure air is compressed in the crankcase, the fuel being mixed with the compressed air just before its intake into the cylinder so that the charge is always prime; the passage through the piston both warms the gas and cools the piston, while the nozzle form of the piston port, projects the gas at once to the top of the cylinder, forcing the burned gases out with the minimum of mixing.



PACKARD GOVERNOR

Automatic Rubber Tire Valve—No. 1,041,216—To Pinkney P. Wood, Hot Springs, Ark. Filed May 2, 1911, dated October 15, 1912. Depending upon the shape and character of the material used in its construction, this valve consists of a simple conical rubber tube, which is a continuation of the valve stem, within the inner tube, which opens upon the pressure from without exceeding that within, and is closed by the pressure within, when that without is exceeded by that within. The advantages of this form of tire valve assuming that its operation is as expected, are simplicity, lack of resistance in inflating the tire, large diameter of passage and cheapness.

The Motor Car Repair Shop

Removing Connecting Rod Bushings

THE piston-pin end of a connecting-rod generally is non-adjustable, the piston-pin bearing usually being of bronze which when worn requires the refitting of a new bushing. The refitting of a connecting-rod bushing is not a difficult operation when suitable tools are at hand; but without them, or some convenient makeshift, the operation is not easy. The tools desirable for refitting bushings include a puller for removing the worn bushing, a block of wood, preferably hard wood, and a hammer to drive the new bushing into place, and a reamer to facilitate fitting the pin into the bushing. It might be well to mention that in fitting a new bushing, it generally is wise to fit a new pin also, as the old pin is quite likely to be worn out of round; and a worn pin cannot be readily trued up again because, being case-hardened, a grinder is required, and even if a grinder is available as the case-hardened portion is quite thin, the grinder might bite into the softer metal below, so that the pin would be very short lived and require that the motor be again laid up for untimely repairs and a new pin fitted.

One common way to remove a bushing is shown in Fig. 1. The jaws J of vise are opened just far enough so that the end of the rod R may rest upon them and at the same time give sufficient clearance for the bushing to pass between them as it is driven out. To drive out the bushing B, a drift D and a hammer are required as indicated. The drift is usually a round bar of steel.

A better way to remove such a bushing is illustrated in Fig. 2. The jaws J of the vise are opened wide, a piece of pipe P, just large enough to clear the bushing, is placed against the inner surface of one jaw, the rod is carefully adjusted and pressed against it to hold it in place until the drift or solid pin N is adjusted into place, then one has but to draw the jaws of the vise together to squeeze the bushing out of the rod R into the pipe P.

When it is required to remove a bushing from a rod that is not dis-assembled from the engine, a bolt B, some washers W, a piece of pipe P, a nut N, and a wrench H may be employed as shown in Fig. 3.

With this equipment, which generally is to be found in the scrap heap of almost any repair shop, a bushing may be removed without the danger of springing or burring up the connecting-rod end.

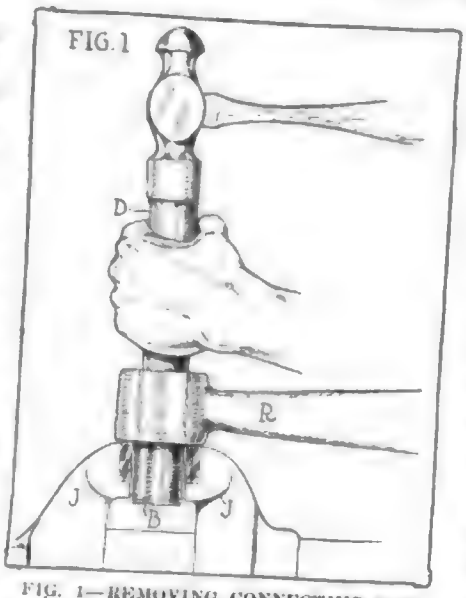


FIG. 1—REMOVING CONNECTING ROD BUSHING WITH A HAMMER

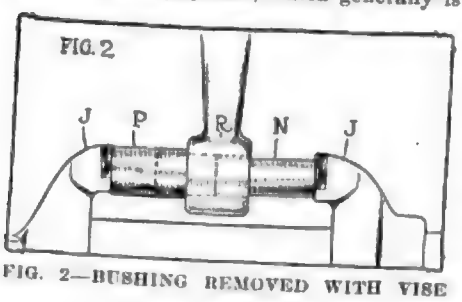


FIG. 2—BUSHING REMOVED WITH VISE

Adjusting a Disk Clutch

There are a number of cars in use having disk clutches on which the adjustment of the clutch is made by means of a series of three or more separate studs or screws. Much trouble often is experienced by motorists who try to adjust this type of a clutch without a knowledge of how it should be done. The proper way to adjust this type of a clutch is to screw the studs back, or release them entirely from contact with the plate or mechanism inside the clutch casing, then screw them up carefully with the fingers until each one just begins to touch, which is indicated by an increase in the effort required.

When each screw or stud has been turned up so that it just begins to touch the plate or mechanism against which it bears on the inside of the clutch casing, then with the aid of a wrench, give each screw a half-turn forward and repeat, until the proper adjustment is obtained. The object is to give each screw the same number of turns and at the same time have them all move forward at practically the same time. If one was to give one screw five or six full turns and proceed to the next one and give it the same number of turns, etc., until all had been turned up the same amount, the same results might be obtained; but it is most probable that the job would not be successful, and perhaps damage to the internal mechanism of the clutch would ensue as a result of possible binding or cracking. On the other hand, if the studs were screwed alternately, little by little, but no care given to the relative number of turns given to each, the springs or operating mechanism would most likely bear unevenly upon the disks, and a jerky, grabbing or slipping action of the clutch would result.

When an inclosed disk clutch which runs in oil has been giving good service for a reasonable length of time and then develops a tendency to slip, or perhaps to take hold too fiercely, the trouble should not be taken immediately for an indication that the clutch is in need of adjustment. Before altering the adjustment of a clutch of this type, one should first drain out the old oil, inject a pint or more of kerosene, preferably with a squirt gun, then close the opening to the casing, start the engine, and with the gear-shifting lever in the neutral position, operate the clutch pedal so the kerosene may be thoroughly distributed and the internal mechanism of the clutch well rinsed and cleared of old and sticky oil. Then drain the clutch casing, flush it out once or twice with fresh, clean kerosene, and refill to the required amount with clean oil.

If after this treatment the clutch still slips, draw out a little of the oil and replace the amount taken out with kerosene; by thinning the oil in this way better contact between the plates is obtained and slipping is reduced. Unless the proper proportions of oil and kerosene are known, the lubricant may have to be thinned down gradually until the proper mixture is obtained; but once found, the extra trouble is rewarded by a fine, smooth action.

Should it be found slipping it cannot be eliminated by means of thinning the lubricant, then an increased spring tension may be required which can be obtained by tightening or screwing up all adjusting studs evenly all around. It is good motor practice never to disturb an adjustment unless an absolute knowledge of the operation and effect of the adjustment.

When a clutch of the multiple-disk type running in oil takes hold too fiercely, drain out the oil, rinse with kerosene as previously described, and refill to the required amount with clean, fresh oil; if this does not prove a remedy, readjust the clutch by loosening all studs entirely and then tightening them until best action is obtained.

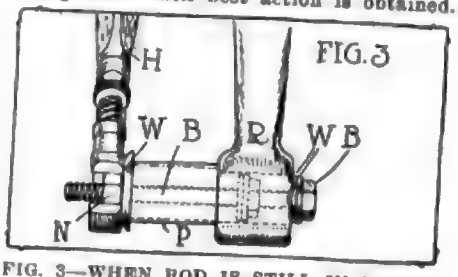


FIG. 3—WHEN ROD IS STILL IN ENGINE

The Realm of The Commercial Car

Overloading and Truck Body Design

Factors that Figure in This Abuse, Causing Extra Tire Wear

By William B. Stout

NOTHING so quickly ruins tires as overloading. Overloading often is due to improper body design. Many times it is due to the truck being too light for the route it is to cover. Sometimes the overloading is the fault of the chauffeur.

Loads not too heavy at low speeds may put an overload on the tires at higher speeds. Tires may be injured directly by overloading through road wear, or indirectly by the body rubbing on them and burning the rubber. A tire need be overloaded but once to spoil its structure. Further use will but bring about its disintegration.

Of a number of cases of overloading noted on a recent date by the writer 50 per cent were due to body design unfitted for the work in hand.

The truck of a piano delivery concern was noted first. This was a 3-ton capacity gasoline truck with an inclosed body, wide doors being left on either side. These doors were just wide enough to take two pianos in their boxes, setting side by side. Between the front edge of the door and the front end of the body was a space of 18 inches or more as at G Fig. 1. This unhandy space caused the overload.

Case of Bad Loading

On several different occasions this machine was noted and always seen loaded as in Fig. 1. The two pianos first put on went into the side doors crosswise of the car. After that two more were set back of these lengthwise of the car, mostly on the tailboard of the body so that more than half of the live load was at the rear of the axle, or point of tire road contact. This loading threw an unusual amount of weight on the rear tires and a closer view of the truck was sought.

The tires were found to be in a very poor condition although the machine itself looked new, having been in operation about 5 months. The block tires on the rear were fearfully chewed up, chips of rubber being broken off the edges of the blocks, giving them a frayed appearance. There was no fault in the tires as they were of a make well known for long wear. The fault was in the custom of overloading.

If the four pianos, which made a load every time noted, had been properly distributed forward the tires would have had a great deal less weight to support, in the opinion of the writer.

To move the pianos to the forward end of the body would require a deal of extra work on the part of the drivers, at least there is enough extra in working the box into this small space forward to keep the drivers from doing it as a general thing. If the piano boxes were all put in endwise then the first one put in would block the side doors for the next one and all the load would have to go on from the rear. By sliding the piano boxes in crosswise, as shown, there was no moving to do after the box was on, making it much easier for the driver and helpers. To get a piano out of the end corner after it was once put in would be a job as well, meaning the moving of other pianos before it could be moved off, unless the order of delivery were noted as the pianos were loaded, which seems to be rarely done, when this could be taken off last.

Balancing Load Correctly

Had the doors at the side been cut at the extreme front of the body at the side the present system of loading would balance the load correctly. This present method of loading is very handy from the driver's standpoint, as any one piano can be taken off without hindering others. It is bad for tires however, and this fact is due as stated before to body design. Another body incorrectly built was seen recently on a converted touring car which reminds the writer of the story of a workman in a different line of work than cabinet making, who, working at home at nights made for himself a new toolbox in which he took great pride. On appearing at the factory with it one morning at the plant ready to fill it with his tools the foreman of the pattern shop happened by and noticed the box the workman was carrying.

"Hello Tom," said he, "What you got there?"

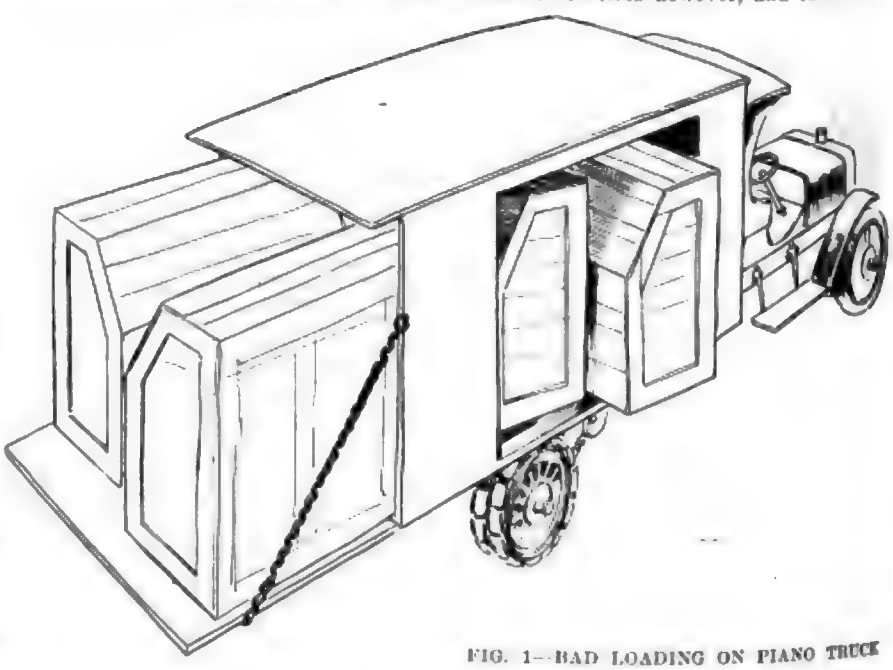


FIG. 1—BAD LOADING ON PIANO TRUCK

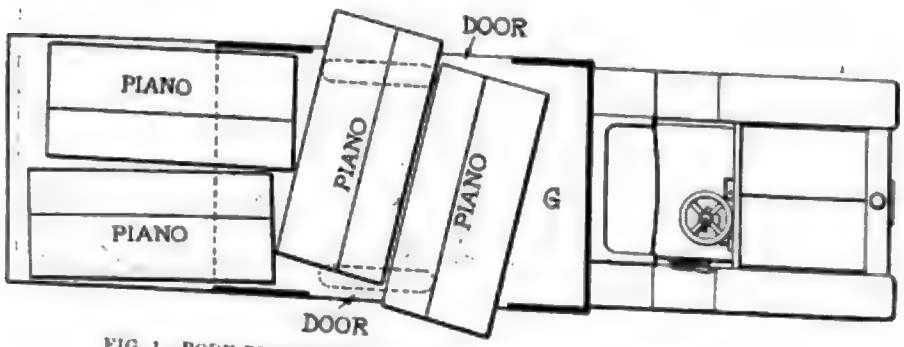


FIG. 1—BODY PLAN PARTLY RESPONSIBLE FOR LOADING METHOD

Tom stuck out his chest a bit and thinking to fool the foreman replied, "Oh, it's a new toolbox I just bought. What do you think of it?"

The foreman eyed the box in silence for a moment over his glasses then sniffed in reply. "Huh," said he contemptuously, "looks like some fool made it himself!"

Body Ill-Fitted to Job

That was just the way the body part of the converted touring car looked—"like someone to save money had built it himself." The workmanship on it was not bad and the finish fair but whoever made it was woefully ignorant of truck or delivery wagon body design. One needs only to say that two-thirds of the body stuck out back of the rear axle to give the reader an opinion of the looks of this delivery vehicle. A small boy would hesitate in catching a ride on the tailboard of this machine for fear his weight would teeter the front wheels off the ground by the leverage of the rear end. This car probably will not be long in delivery service for the firm now owning it, for even if the body does hold together, the tire expense will prohibit its working at a rational delivery cost.

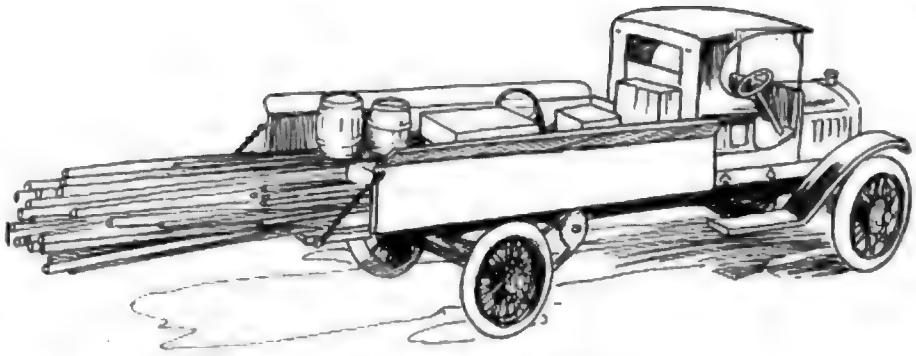


FIG. 2—CASE OF OVERLOADING WITH IRON PIPE

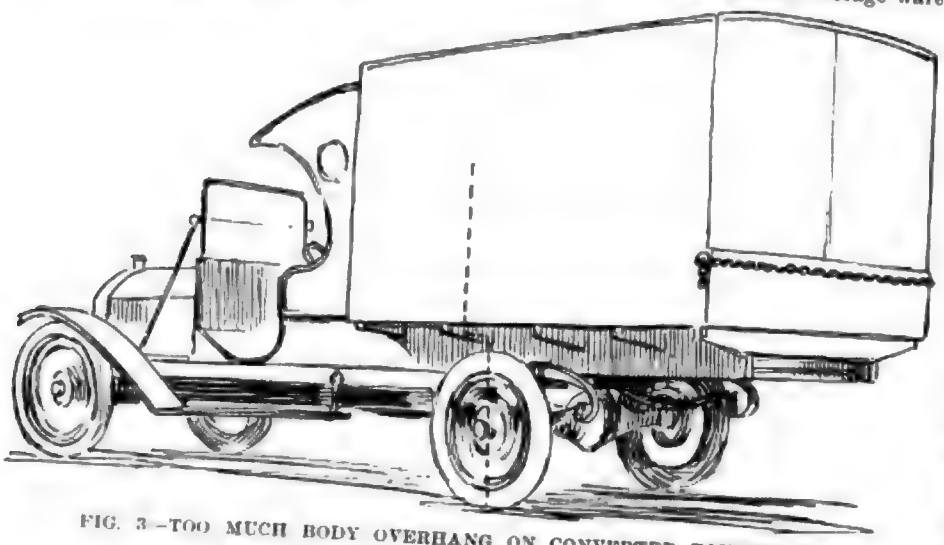


FIG. 3—TOO MUCH BODY OVERHANG ON CONVERTED TOURING CAR

Had Rear Axle Trouble

An iron and supply concern in using a standard make of truck was finally obliged to fit its truck with a new and heavier rear axle and tires on account of frequent overloads of long lengths of iron pipe. Often over half the length of a part load of iron pipes would be sticking out back behind the tailboard, throwing the weight clear to the rear. With this overload the rear tires wore out rapidly and finally the rear axle of the truck gave way. Newer and heavier equipment has done away with the trouble.

Had the body been designed so that the pipes could stick out forward the old axle and smaller tires would have performed the service with no trouble at all. The Monitor small truck has adopted a scheme allowing of this, and some such an arrangement might have been a more efficient remedy for the firm in question than fitting a new rear axle and thus deviating from the standard of the particular make of machine.

Burning up Tires

A direct injury to tires was noted in a ride on a meat truck from a storage warehouse to a downtown meat store in Chicago. The truck was of 2-ton capacity and was loaded with about 4,500 pounds of frozen meats. Leaving the storage plant and coming onto a cobble pavement, the wind blowing from the back brought a strong smell of burning rubber. Looking back from the seat the writer was just in time to see smoke stream out from under the car body like water from a street sprinkler, caused by the tires hitting the under side on bumps and rubbing at high tire speed. The driver paid no attention to it and the tire continued to smoke during a mile and a half run. This is a reflex result of overloading outside of the injury down to the same tires on the road at the same time. Rubber and heat are a poor mixture.

STRIKE BECAUSE OF MOTOR TRUCKS

Because modern motor trucks have been installed in part to replace team service by the Consolidated Bottling Co., of Chicago, thirty regular teamsters walked out today. The concern has added six motor trucks, each of which will do the work of two horse vehicles. The teamsters wanted each motor truck restricted to do the work of only one team. The company was compelled to seek police protection for its property, and threatened to shut out the striking ones unless they give up their foolish demand at once and return to work. On account of the teamsters' attitude, it has been necessary, according to George Lomax, president of the Consolidated company, to have three men on some of the trucks. In hiring chauffeurs to run the machines, the teamsters refuse to give up their wagons, and, upheld by the union, demand to ride on the motor trucks and to make the sales and give the receipts. In addition, a boy is taken along on the heavy routes to assist in the unloading.

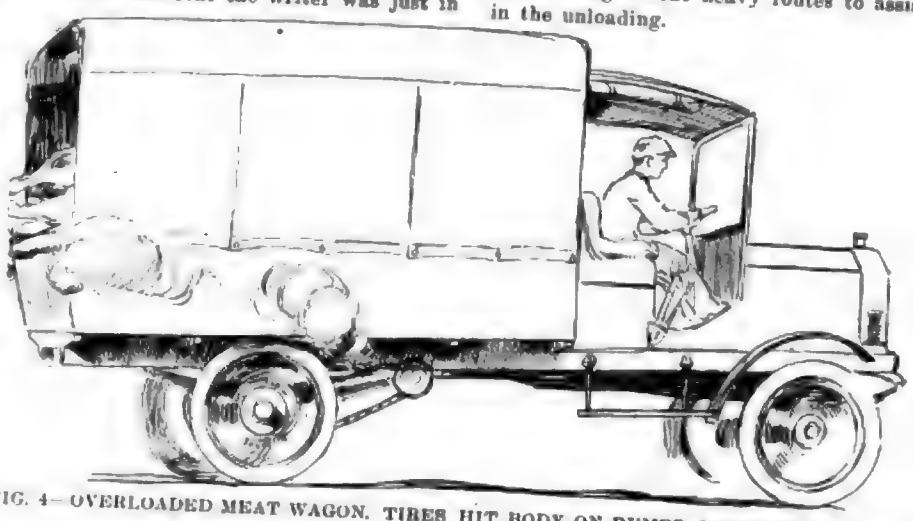


FIG. 4—OVERLOADED MEAT WAGON. TIRES HIT BODY ON BUMPS, BURNING UP TIRES

Savannah's Municipal Motor Service

Comparison With Last Year Shows Considerable Saving

COMPARATIVE statements issued by the officials of the Savannah fire department showing the cost of maintenance for 9 months of last year, with the horse-drawn apparatus, and for the same period this year, with the motor-driven machines, show a saving of $4,064.60 for the period. This decrease in the cost of maintaining the department has been effected despite the fact that there has been a decided increase in the cost of stock food, coal and gasoline.

The total cost of maintaining the department through September of last year, before the installation of the motor-driven apparatus, was $8,317.55. The total expense for the same month this year, while the motors have been in operation, was $4,064.95.

The figures for January show the expenses of the horse apparatus last year for that month to be $362.93, while for this year the expenses were $659.86. This shows a slight increase for the present year, but this is explained by the statement that there were certain extraordinary expenses during that month this year in connection with the few horses that have been retained for emergency purposes.

The statement for the month of February shows that during that month last year the expense of maintaining the apparatus was $1,804.75, including $825 spent for new stock, while for the same month this year the motor-driven machines were maintained, and the remaining horses in the department fed and kept in condition at a total expenditure of $308.03. The figures for that month show an advance in the price of oats of from 50 cents to 67 cents, and in hay from $1.30 to $1.65. There also was a slight advance in the price of coal, while there was a decrease of half a cent a gallon on the price of gasoline.

During the month of March it cost $379.40 less to maintain the department this year than it did last year. The total expense of the apparatus a year ago for that month was $1,033.13, while for this year it was $652.73.

The motor apparatus has proven economical in the figures comparing the months of April of the 2 years, despite the fact that there was an increase in the cost of feed. The price of gasoline, however, remained the same, although additional stock was purchased in this month of 1911. In April of 1911 the maintenance of apparatus cost the city $1,455.51, while for the same month this year it cost $463.80.

The expenses for the month of May this year show an increase of $135.69 over last year, but for the month of June a saving of $637.41 is shown by reason of the installation of the motor apparatus.

During the month of July, both years, feed was purchased, yet the comparative statement shows a decrease in the cost of maintaining the department with the motors. The total expenses for that month last year were $968.16, while for this year it was $679.80.

The figures for the month of August show a decrease of $196.39 in the expense of maintenance, while for the month of September a decrease is shown as between $896.38 for the horse-drawn apparatus and $369.15 for the auto apparatus.

There was also a large coal bill with which the city was confronted regularly at intervals with the steam engines. This item has been practically eliminated, as the only coal now consumed by the department is in heating the buildings. The price of this commodity has also advanced considerably during the year.

In addition to this, Chairman Hull declares that unless the city had installed the motor-driven apparatus, the erection of another engine in the southern section of the city would have been necessary. This would have added considerably not only to the first expense of construction, but of equipping it with apparatus and maintaining it. Owing to the rapid growth of the city this would have been necessary, while with the fast motors the entire city is covered with fewer machines.

IMPROVING ODD MOMENTS

It is possible even with motor trucks to kill two birds with one stone. Revell & Co., furniture dealers of Chicago, have five motor trucks. These machines, through hindrances of delivery schedule, stand idle in loading for several hours during the day at the side and in the alley of the company's store. From 8 to 11 a. m. is not an unusual wait for these machines.

The loading is hindered by the fact that every piece of furniture put on must be brought from the store proper and not from the shipping room on account of its small capacity. This room would hardly hold goods to load one truck, much less five, and the machines wait accordingly.

While idle at the curb, however, waiting for the load in small bits at a time, the drivers are busy. On the morning of October 1 two of these machines were standing at the curb of Revell's store at 8:20 o'clock. One machine had two or three articles inside, the other was about one-fifth loaded. The one machine had the hood off and the driver with a helper was busy soldering a leak in the radiator with the aid of an electric soldering outfit, the cord of which stretched across the sidewalk. He was making good use of his time while the truck was idle, doing work at this time to save delay at another. The presence of the electric soldering outfit at the store proved that the firm was with him in his work and furnished equipment for this sidewalk repair hour.

Under the second machine was the other driver, sitting on a piece of carpet and tinkering with the jackshaft and chain adjustments on the radius rods. Realizing that the idle time at the curb is unavoidable with present facilities, this firm is making double use of the delay by putting the drivers at repair work and adjustments while the loading is going on. The truck loading was being done by helpers.

PROPER LOADING OF TRUCKS

Proper loading is a big factor in prolonging the life of motor trucks, in the opinion of Harry S. Houpt, general sales manager of the American Locomotive Co. motor car department. How to secure the right distribution of a load, and the effect of good balance of weight in preserving the springs, tires and other features of mechanism, are told by Mr. Houpt in the following suggestions to motor truck drivers:

"Do not place all the heavy articles on the rear of the truck. If you place a heavy article on the rear of the truck, place an article of like weight on the front also.

"If you have a small and heavy load, such as steel rails, use a small body. Have the body constructed so that the load will be centered. If a tank body is used to haul over rough roads, it should be made only large enough to carry a normal load.

"Do not overload. If the body is too big, do not load the truck to the capacity of the body.

"Some drivers are unnecessarily hard on tires. The way the truck is loaded has a good deal to do with the wear. Balancing the load not only saves the tires and springs, but the driving mechanism also."

TRACTORS POPULAR IN CANADA

The Winnipeg correspondent of Canadian Agency Ltd. reports that during the present summer 6,500 motor tractors have been breaking new land for crop next year in the Canadian west. Putting their daily average at the extremely low figure of 10 acres a day, and allowing them 60 days' work during the season, which is a most conservative estimate, this would represent 3,900,000 acres of new land for 1913, and to this must be added the many thousand acres that have been broken by horses and oxen. No matter how rapidly transportation facilities are provided for the movement of the crop, the western farmer can keep ahead of them.

Cases Where Motor Trucks Save Money

Business Houses Relate Experience With Power Vehicles

THE Inspiration Consolidated Copper Co. of Miami, Ariz., has three Velie motor trucks in continuous service hauling supplies from the town of Miami to the Inspiration and Live Oak mines, distances of from 1 to 3 miles. One is of 1500-pound capacity, one of 1½-ton, and one 3-ton.

A record was kept for 1 month of the performance of the 3-ton truck in hauling fuel oil from the railroad station at Miami to Live Oak No. 2 mining shaft, a distance of 2.1 miles. The load consisted of 870 gallons of oil, weighing 6,740 pounds, which was over 3 tons in weight. The road was in fair condition, with less than 3 per cent grade for most of the distance, the last 200 to 400 yards having a grade of from 3 to 8 per cent. About 45 minutes was required for a trip loaded and 20 minutes for the return trip empty. The maximum number of loaded trips per day was six. The cost per ton-mile was 48 cents, of which 24 cents was for labor and depreciation, 13 cents for repairs, and 11 cents for fuel and oils. This was 9 cents per ton less than the cost of hauling by teams, a saving of 16 per cent.

This truck is now engaged exclusively in hauling oil to the two mines, while the two lighter trucks are hauling other supplies from Miami to the mines and between various points on the property. Besides the reduction in cost, the motor trucks effect an economy, by virtue of their greater speed and convenience, that cannot readily be measured in dollars and cents. The mine officials are satisfied with their performance and they have apparently come to stay.

THREE TRUCKS OUST SEVEN HORSES

John Luxem, wholesale meat dealer, Minneapolis, Minn., is using up-to-date delivery equipment in the form of two 1-ton Reliance trucks and one 1-ton Chase. The larger machines are used for city work in general, the smaller one for delivery nearer at hand. The machines have displaced seven horses and average 70 miles a day. About fifteen stops per trip are made the average length of stop being about 4 minutes. It takes about 20 minutes to load the vehicles. Tires last about 10 months. Each machine is doing the work of more than two teams, so that financially as well as from a service standpoint the machines are a success. The 2-ton machines have been in service 3 years, the 1-ton is in its first year.

SAVES $10,000 A YEAR

The Whitten-Gilmore Co., of Boston, Mass., handling Federal and Dayton trucks reports that a customer who does not wish his name published is saving $10,000 per year by the use of five 3-ton trucks. A daily expense per truck of $9.74 is averaged, including the wages of driver and helper. The five trucks are doing the work of twelve double teams costing $7 to maintain per day, with drivers and helpers. The saving is of course the difference in the outlay of $48.70 and $84 which equals $35.30 per day or $10,590 per year, allowing 300 working days. Drivers are paid $3 per day and helpers $2. Five drivers and five helpers do the same work that twelve teamsters and twelve wagon men do, the wage saving being $8,760 per annum, figuring teamster's wages at $2.50 and helpers $2.

QUICK COAL DELIVERY

William H. Harlow, Hyde Park, Mass., is an enthusiastic user of motor trucks in coal and lumber work.

"One day," says Mr. Harlow, "one 3-ton Kelly with the chauffeur and two helpers delivered to a consumer ½ mile from our scales 52 tons of coal in 6 hours 15 minutes. This coal was delivered in 100-pound canvas bags. Another 3-ton machine made ten trips with lumber averaging 1¼ miles from our yard from 7:30 a. m. to 6:00 p. m., carrying 32 tons. Each of our 3-ton machines is doing the work of two teams."

SERVICE IS SATISFACTORY

The Hoeffner Dry Cleaning Co., of Chicago, is a small concern in the north section of the city. For quick delivery work this firm has in use a Ford delivery wagon of well kept appearance which is doing much to establish the footing of this new concern in a new territory.

The machine operates over 30 to 40 miles of road every day, making thirty-five to fifty stops per day. The cost of running is less than $5 a day, all things included. The firm is enthusiastic over the machine and considers it an especially good investment as an advertisement outside of its delivery worth. The figures quoted were given offhand, as no accurate data is kept on the operation costs beyond gasoline and oil. The car makes about 20 miles to the gallon of gasoline. After the first enthusiasm of its use passes the firm probably will keep more accurate costs.

INVENTORS WORK ON SPLASH-GUARDS

Having asked for appliances to prevent the lateral splashing of mud by its city omnibuses, the Paris General Omnibus Co. has received about 200 inventions. The appliances are being studied by the omnibus engineers and the more promising ones will be asked to take part in a practical test at the expense of the bus company. Owing to the large amount of work involved in investigating the schemes, the date of the practical test has not been announced.

Independently of the bus company's competition, the Automobile Club of Seine and Oise is holding a splash-guard competition at Versailles on Saturday and Sunday, November 2 and 3. On the first day the ability of the appliances to withstand rough driving will be tested on a run from Versailles to Chartres and return, a distance of about 60 miles. As the road is straight and fast, high speed will be maintained. A total of 10 points can be obtained under this heading.

The second day of the competition the appliances will be tested over a mud track with white indicator boards on each side; also with a view to their longevity when brought in abrupt contact with the curbstone; and finally with a view to their quick attachment to either a fixed or an emergency wheel.

COST OF OPERATION

The W. H. Pipkorn Co., Milwaukee, Wis., is using one 5-ton truck, one 4-ton truck and one 1-ton truck in the delivery of fire clay products and building material. The cost of operating the 4 and 5-ton machines is given as follows:

	4-ton.	5-ton.
Gasoline	$18.50	$19.60
Mileage	771	808
Tonnage	498	580
Time, days	20	20
Average mileage	38½	40
Average tonnage	24.9	29
Miles per gallon gas	4.17	4.12
Cost per ton	$.60	$.50

The smaller capacity of the 4-ton truck, without any increase in daily mileage, accounts for its higher cost per ton.

CARRIES 90-FOOT TIMBER

The motor truck or motor vehicle has recently entered into another section of commercial life. The ordinary motor truck up to the present time has been unable to handle long-length timber, and it was one place where it could not supplant the horse.

The Knox-Martin tractor, however, has solved this question. The tractor of this make, owned by Pope & Talbot, of San Francisco, during the past week hauled two sawed timbers 20 by 20 inches and 90 feet long. The tractor took these two timbers all around the city, was able to turn the corners of any of the streets without backing and handled it so much easier than the horse-drawn vehicle that it not only surprised the lumber people but was also a revelation to the motor car men. Ordinarily, turning the corner with a horse, the leaders would have to go on the sidewalk to make the turn, but with the tractor it was able to go from one thoroughfare into another as easily as if it were a load of merchandise on the ordinary truck.

The irregular line below the crankshaft is the bottom of the crankcase. The crankcase is simply a pan that holds oil to lubricate the motor and this oil is kept at a level high enough to let the ends of the connecting rods dip into it. They splash the oil all around the inside of the crankcase and cylinders so that it finds its way to all places where it is needed.

Fastened to the rear end of the crankshaft is the flywheel. This is simply a cast-iron wheel which gets to spinning and keeps the crankshaft from stopping between explosions. It is heavy enough to keep turning for some little time after the explosions start it going around. In the case of the car illustrated in Fig. 3, the flywheel also contains the clutch. It will be seen that the rear edge of the flywheel tapers inwards toward the rear and on the inside of it is a smaller wheel whose rim has the same shape as the inside of the flywheel rim. This is the clutch. It is held back by a spring indicated by the double row of dots so that its face is pressing against the inner face of the flywheel rim. That is the position shown in the illustration, and it is pressing hard enough so that when the flywheel turns, the clutch turns too. The crankshaft ends there, the clutch not being attached to it but to the transmission shaft which runs back from the clutch. When the clutch is pressed inward its face does not touch the flywheel and so the flywheel can turn without making the clutch or the shafts behind it turn.

It will be seen that the short shaft to which the clutch is fastened runs back straight a little way to a ball-shaped affair, and there another shaft runs back at a slight angle. The ball-shaped affair is the universal joint by which the short shaft and the longer one are connected so that one can turn the other while not in the same straight line. The long shaft inclined downward is the propeller shaft and it runs right back to the gearset. Sticking out to the rear of the gearset is a short shaft with a small bevel gear on its end which meshes with a larger one on the rear axle. This car differs from the one illustrated in Fig. 1, October 10 as in this the gearset is on the rear axle, while the gearset of Fig. 1 was between the clutch and the propeller shaft, which is the more common practice.

A study of Fig. 3 will show that there is a tube running from the universal joint to the gearset and surrounding the propeller shaft. This is called the torsion tube or torque tube. It is attached to the frame at its front end and to the rear axle housing at its rear end. It forms the connecting link between the rear axle and the frame so that the rear axle pushes the car by pushing on this tube. Sometimes in place of the torsion tube, solid rods are used, which are called torsion or torque rods. Of course the rear springs are attached at their bottom to the rear axle and at their top to the frame, but they are not connected firmly enough to take all the strain of pushing the car.

The Motorists' Bookman

Text Book for Motor Car Engineering

TREATING the subject of motor car engineering in a general manner, and reviewing the development of the motor car in England, this work by A. Graham Clark in its first volume is on construction. Mr. Clark is a lecturer of some note on these subjects, and a member of the English Institution of Automobile Engineers. The book is especially valuable for its thorough descriptions of English motor cars which are the only ones treated in the book. In a deeper vein, the subjects of fuels; the thermodynamics of internal combustion engines; indicated horsepower, brake horsepower and formulated horsepower; mechanical, thermal and combustion efficiency; and crank effort are deeply entered into, and brief chapters are devoted to steam and electric cars. The book contains, including illustrations, double indexes, an exhaustive appendix of tables, charts and examination forms, 437 pages, bound in red cloth and selling for $2.12. Constable, London.

Carbureters and Engine Troubles

Containing fifty-four pages of readable and accurate information, the Breeze Carbureter Co., Newark, N. J., has published a book on motor car engine adjustments and care that, while in the form of an advertisement of its products, is valuable none the less. Coleman S. O'Laughlin is the author. This book, which is in pamphlet form, contains hints and instructions for the location and remedy of nearly a hundred troubles, frequently met with, and treats broadly troubles of all kinds, and very comprehensively those peculiar or related to carburetion. It sells for 50 cents.

In the Land of Sunshine

The motorist contemplating touring the Golden state will find John S. McGroarty's gracefully written history of that western commonwealth, entitled simply "California," excellent preparatory reading if he desires to get the most out of such a tour. With much detail, the history is given of its discovery only 50 years after Columbus found the continent of America, the establishment of the missions, life under Spanish and then under Mexican dominion, the brief period of less than 1 month as the Bear State republic, and its entry into the union. Published by the Grafton Publishing Co., Los Angeles.

More Route Books

Under the title of "Indian Pathfinder," or "Havoline Tours," a series of paper-covered tour books—fifteen in number—covering the entire country has been gotten out by the Indian Refining Co., New York City. Printed on manila paper of medium shade and weight, with cover of a heavier quality, each number is devoted only to a limited section which makes it of handy form and size. A brief digest of the laws governing motor cars for the territory covered by that leaflet is given in each, and, while the route information might have been a little more full without appreciably increasing the size of the book, it is well supplemented by maps.

British Patent Guide

As a guide to Americans after a patent in Great Britain, "Practice Before the Comptroller of Patents," by Carrol Romer, M. A., should prove of great value. The processes in England differ considerably from those in America, and forms are of great importance. This volume is the first of its kind, and is thoroughly up to date. It deals in detail with every feature of patent practice and precedent, in thorough-going English style. A complete appendix is included in the work, containing laws relative to patents, patent rules, fees, forms, and rules for appeals, together with various other regulations. Over 300 cases are cited, and many hints on proper precedent and method of procedure are given. The book contains 324 pages, is unillustrated, is bound in olive cloth, and is published by Street & Maxwell, Ltd., London, Eng.

Metallurgy Up-to-Date

A work on current practice in the production and manufacture of iron and steel has been prepared by Bradley Stoughton, Ph.B., B. S., and published by the Mc. Graw-Hill Book Co., of New York.

"The Metallurgy of Iron and Steel" is intended as a text book for colleges and for practical engineers, architects, etc. It is a complete and exhaustive treatise on American production and manufacture of the products of iron ore. Such a book supplies a well defined need for leading producers of steel and iron.

Inexpensive Motoring

"Motoring for Two from 10 Shillings a Week" is the title of a little brochure on motor car travel which must attract many, as it points out the feasibility of those of very modest means enjoying such journeyings as will not exceed 3,000 miles in a twelvemonth for the nominal cost for actual running expense of the car of $126.52. For such purpose various types of lightweight voiturettes and runabouts are suggested as possible, from those weighing 500 to 1,400 pounds, with a one or two-cylinder engine developing not less than 7 horsepower. The sociable, or three-wheeled car, is considered, as is also the possibilities of the motorcycle. The subject is made very attractive, and is written from the standpoint of one who has had experience, the author being Major C. G. Matson. Thomas Murby & Co., London, Eng. Price 12 cents.

the company are: John R. Scott, president; W. F. Ridge, vice-president and general manager; Walter H. Jenks, secretary and treasurer.

Bayerline Building a Car—A. G. Bayerline has secured manufacturing space in the plant of the King Motor Car Co., where he is at work on the car which he will shortly introduce to the motor world. Mr. Bayerline was formerly general manager of the Warren Motor Car Co.

Another Indianapolis Recruit—The Federal Motors Co. is preparing to erect an enormous plant in Indianapolis, the plans having been received. Contracts are to be let at once and the construction work started as soon as possible. The plant will consist of a one-story building several hundred feet long, to cost $150,000 exclusive of the machinery. The construction will be of brick, steel and reinforced construction and of the saw-tooth type, assuring a daylight plant. The new factory will be located in West Fifteenth street.

Walpole Company Incorporated—The recently formed Walpole Tire and Rubber Co., an adjunct to the Walpole Chemical Co., has been incorporated with a capital of $4,500,000, and its stockholders comprise men prominent in the business world of Boston and vicinity among them the following: Ernest W. Tinkham, Alvi T. Baldwin, Frederick J. Gleason, Elmore C. Green, Everett W. Furbush, Louis O. Duclos and John C. Blanchard, Jr. The tires are produced at the factory at Walpole, Mass., where an extensive rubber business has been carried on for years.

Continental Stock Increased—At a recent meeting of the directors of the Continental Motor Mfg. Co., the capital stock of the concern was increased from $500,000 to $2,400,000. Of this amount $900,000 was made preferred stock and $1,500,000 common. The latter will remain in the treasury to take care of present improvements and additions to the plant, as well as to cover any dividends to stockholders. According to President Tobin, the concern is in an exceedingly prosperous condition, the entire output of the large plant being sold up through August, 1913.

Packard's Paris Branch Moves—Business having increased in enormous proportions, R. N. Goode, European manager of the Packard Motor Car Co., has moved his headquarters from Boulevard Pereire to a handsome store in the Rue Newton, about 2 minutes' walk from the Place de l'Etoile and the Champs-Elysees. The Packard European depot is no longer a service depot only, but a selling branch, the Rue Newton store having on exhibition the leading models produced at the Detroit factory. The new headquarters are excellently situated in the heart of the wealthy residential and hotel district, and in that part of Paris best known to Americans. The European branch of the Packard company now has a sales department, a service depot, a hire department, and also repair shops in the suburbs of Paris. The hire department is reported to be busy with touring parties visiting the south of France and Italy.

Richmond Sets Show Dates—The spacious Horseshow building has been secured by the Richmond Automobile Dealers' Association for its first show, which will be held February 16-23, next. The sum of $10,000 will be expended in putting on the exhibition. There is a total floor space of 13,000 square feet and up to date there remains but about 2,000 square feet to be allotted, with quite a number of local dealers and accessories firms to hear from.

Sturdy Gets Sta-Rite Line—The Sturdy Mfg. Co., of Chicago, maker of Sturdy spark plugs, has taken over the Sta-Rite line of ignition plugs, consisting of the Venus, Vulcan and Gotham, due to the failure of the R. E. Hardy Co., which has manufactured these plugs since 1900. The Sta-Rite Vulcan plug is of the double porcelain type, the Venus, a mica plug, and the Gotham a single hollow porcelain spark plug. The Sturdy company also will build special brand spark plugs on a large scale for the 1913 season.

Fire on Pittsburgh's Row—Fire in the heart of the east end motor district in Pittsburgh, Pa., on the morning of October 16, caused a loss of about $8,000 and much worry among the dealers lest the blaze get beyond control of the firemen and spread. The flames broke out in the Abbott-Detroit agency at 221 Beatty street. There was great excitement for some time, the workers in other garages in the vicinity having a busy time of it getting out the cars from the buildings. The Essanay Tire Co., at 219 Beatty street, suffered some loss, as well as the Beatty Auto Repair Co., at 223.

Prospects Good in Northwest—One of the straws indicating to the wholesale car dealers and the branch managers that the outlook for sales is good in the northwest is the heavy contracting for new garages in all the states tributary. Weekly reports from architects, contractors and building exchanges show that the activity is heavy, and that in all the smaller cities not supplied with good central garages buildings are being remodeled for motor car purposes or are being built. In the Twin Cities several large structures are being erected or are contracted for, by some of the large dealers or by factory branches. Motor rows in the two cities are growing rapidly as the agents, managers and dealers show more clearly the gregarious instinct. No indication is on the surface of a lessening in the business. With bank clearings mounting fast, to show cash grain deliveries, and threshing crews enabled to work extensively, where the weather has been bad heretofore, the spirits of the dealers mount. Car congestion is reported as not serious as the railroads had made every precaution by abandoning construction work which would interfere with the movement of cars. Grain yards in the Twin City district were added to in the summer by heavy purchases of real estate and by adaptation of old yards to handling grain cars.

Timken Conference Held—The quarterly sales conference of the Timken Roller Bearing Co. and the Timken-Detroit Axle Co. was held at Canton, October 15. After the business session and supper the selling forces repaired to the auditorium, where Governor Johnson spoke.

To Make Gear-Shifters—Clark A. Oostdyke, former director of purchases of the General Motors Co., has incorporated the Oostdyke Gear Shifting Co., of Detroit, with $1,000,000 capital, to manufacture a gear-shifting device which does away with shifting levers on the car, the gears being operated from a keyboard on the wheel.

Lenox Increasing Capacity—The Lenox Motor Car Co. of Boston has made plans for a largely increased product for the coming season, and with this object in view it has secured the services of W. K. Hadley as general sales manager and purchasing agent. Mr. Hadley has just resigned as special factory representative of the Marion Sales Co. and prior to that was for 5 years with Maxwell-Briscoe.

To Make Steel Wheels—The Ideal Steel Wheel Co., a new Cincinnati corporation, has bought the former plant of the Seufferle Cooperage Co. on Spring Grove avenue, Winton place. The transaction of property is said to have involved $41,000. The general dimensions of the building just acquired are 200 by 226 feet, together with several minor structures. J. B. Fitch is president; J. E. Strielmeier, the inventor, vice-president; E. H. Massey, treasurer, and Harrie Walker, secretary and manager.

Minneapolis' Building Activities—Four motor car buildings are being constructed in Minneapolis for Andersch Brothers, Abbott-Detroit, to cost $35,000; for the Colby Motor Co., to cost $10,000, and for the Bowman & Libby, Inc., Overland, and the Goodyear Tire and Rubber Co., to cost $100,000. The Ford Motor Co. will erect a $200,000 building and the Avery company, Peoria, Ill., has bought a site for an implement and motor car building. The F. E. Murphy Automobile Co., Mitchell line, is erecting a $250,000 building.

Federal Increases Stock—The Federal Rubber Mfg. Co., of Milwaukee, Wis., with factory at Cudahy, Milwaukee county, has increased its capital stock from $1,000,000 to $2,000,000 to accommodate the remarkable growth of the business. Since January 1 the factory has been working night and day and the actual sales have exceeded the pre-season estimates by more than $400,000. During the past season the company has done extensive construction and improvement work, valued at nearly $500,000. A principal improvement was the construction of a new central power, lighting and heating plant aggregating 3,300 boiler horsepower.

Development Briefs

Improvements in Goggles and in Cotter Pins—Gasoline Starter and Primer—Gasoline Gauge—Gas Lighter and Controller—More Ford Lighting Outfits

Sanitary Eye and Nose Shield

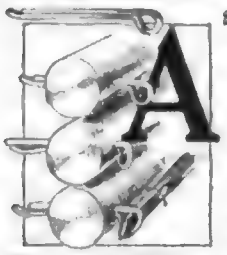


FIG. 1—CAMPBELL COTTER

AS A substitute for the cumbersome, uncomfortable, and unsightly goggles that are often worn, the Sanitary Sales Co., Bradford, Pa., offers the eye-shield shown in Fig. 3. It consists of a celluloid pane, bound with a cushioning tape, and fitted with attaching bands, with a gauze strip beneath the nose, which excludes dust from the nostrils. The pane is well away from the face, so that spots on its exterior will not affect the eyes, and permitting it to be worn over glasses. The celluloid is made in plain, amber, blue, and green shades, and the shield as a whole weighs but ½ ounce. It is sold in a leather case, which protects it from injury when not in use. Being of celluloid, cloth and gauze, there is nothing to break if accidentally dropped.

Safety Gasoline Gauge

Glass stand-pipe gasoline gauges are most convenient to read and are little affected by road vibration and jouncing, but they possess the fault, in most instances, of the danger in case of breakage. Connected as they usually are directly to the gasoline line, if the glass tube becomes broken, the gasoline is allowed to leak out of the gauge until the supply cock in some inaccessible portion of the car is turned off. To conserve the good points of the glass gauge, and yet eradicate this drawback, the Emergency Safety Co., Port Huron, Mich., has produced the Safety gasoline gauge, Fig. 4. This gauge may be applied to any convenient portion of the car, within reach of the driver. It differs from others of its type in that the feed to the gauge is not constant, but is through a valve, normally closed, which is opened by pressure on the push-button on top of the stand-pipe. To read the gauge, this button is pressed. This simple device affords the owner a positive means of determining the fuel consumption of his car, as after a reading, the level in the gauge remains the same until the button is again pressed, when the difference in level can be accurately noted. In the same manner, the owner can know positively how much gasoline is being put into his tank, when a supply is already contained therein. In case of breakage of the glass, only the fluid contained in the tube is lost.

Webb Jay Primer

It is in cold weather that a good primer is appreciated, and if the claims of the Fowler Lamp and Mfg. Co., Chicago, are substantiated, the Webb Jay automatic suction priming system should come in for a large amount of appreciation. On the principle that it is gasoline that must bring the first response of the engine, regardless of the manner of starting, or the form of starter used, the inventor of this device has designed a starting primer that differs considerably from others of its kind. The chief difference is that the gasoline, un-carbureted, is introduced through the inlet valves, on the dying revolutions of the motor, where it is partially vaporized by the heat of the cylinders, thus giving a much better fuel for starting a cold motor than cold liquid gasoline introduced after the motor had cooled. There is no pressure to be pumped up in the Webb Jay system, the suction of the motor drawing the fluid from a bi-pass in the gasoline line to a reservoir on the front of the dash, and through a valve to the inlet manifold lead. This valve is the only visible portion of the device, and is operated upon the dying revolutions of the engine, just after the switch is turned off. The supply in the reservoir is for the purpose of priming the motor after the car is left standing for some time, when all of the gasoline left in the cylinders on stopping would have evaporated. This system is adapted to either pressure or gravity feeds, as shown in Fig. 2.

FIG. 3—SANITARY EYE AND NOSE SHIELD

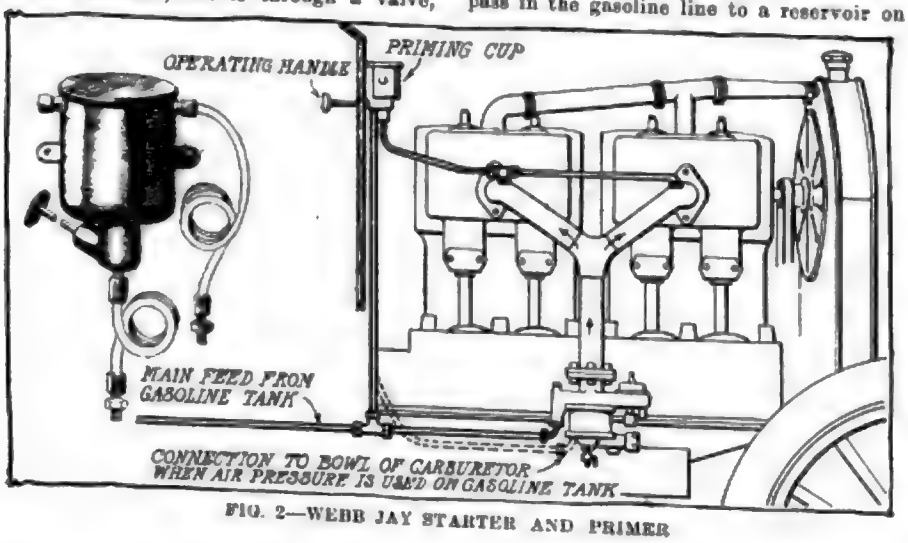


FIG. 2—WEBB JAY STARTER AND PRIMER

Gray Specialties

One of a complete line of tire sundries manufactured by the Gray Specialty Co., Newark, N. J., is an especially interesting spare tire outfit. This outfit has been selected with a view to providing the private owner with just the material he will need for ordinary repairs, in the most convenient form, and consuming the minimum of space. The outfit includes cement, acid, rubber putty, adhesive tube patches, emery paper, brushes, repair plaster, assorted blow-out patches, and an outside boot with laces. This outfit is made in several sizes, and in a smaller edition, known as the tourist's outfit, which is similar, but not so complete.

Campbell Cotter Pin

In many instances the insertion and extraction of cotter pins in a motor car is a decidedly ticklish job, using the ordinary type, due to the fact that in order to spread the prongs, the head must be held in place, while the prongs are spread with a screw-driver, flat-peen hammer, or cotter tool. In other words, it involves working on both sides of the bolt or rod, through which the pin is inserted. The same difficulties apply to the extraction of the pin.

and are greatly enhanced by the inaccessible locations of many of the parts which use this form of fastening. To overcome these difficulties, A. C. Campbell, Waterbury, Conn., has produced the spring cotter shown in Fig. 1. This cotter is inserted, locked, and withdrawn all from one side. Inserting it, a tap on the eye, drives the shorter leg over the hooked longer one, and spreads it, as shown, while a screwdriver, twisted in the direction of the arrow, draws it back to its original position, permitting it to be withdrawn, and used again if need be. These pins are sold in boxed assortments especially designed for the use of motorists.

Aubeuf Dimmer and Lighter

That many accidents to motor cars are due to the blinding glare of the headlights is an incontrovertible fact, and its recognition by the legal authorities has inspired many inventors to produce remedies for this glare, which reduce the dazzle, without imparing the use for which the headlights were intended. The

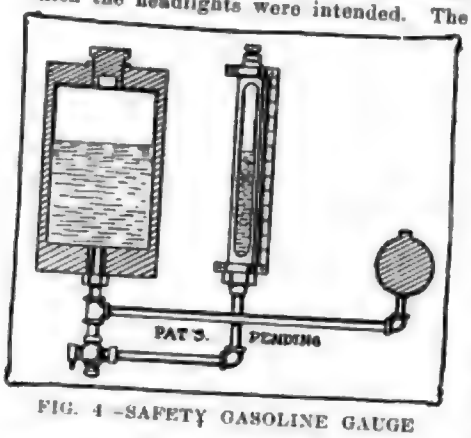


FIG. 4—SAFETY GASOLINE GAUGE

Aubeuf Dimmer is one of these. It consists of a simple gas cock with a convenient operating lever which is placed in a convenient position to the driver, being interposed in the gas line between the lamps and the tank or generator. The lighting feature consists of sparking points on the burners of the lamps which are wired through a switch on the dash to one of the plugs, shorting it when the circuit is closed by means of the switch, causing the high-tension current to flow through the lighting wires, and spark at the lamps. This outfit affords an advantage not possessed by electric lights, viz. —dimunition of the light, and at the same time possesses the advantage of the latter of lighting and extinguishment from the seats.

Merz Valve-Spring Release

In removing valves and stems for replacement, a good valve-spring release is indispensable. Fig. 5 shows such a one. The Merz valve-spring release is the product of H. B. Merz, Pittsburgh, Pa., and is in the form of a malleable three-part screw clamp, the lower jaw of which is bifurcated to straddle the stem, and fitted with an adjustable gauge, which centers the fork on the stem, preventing the bending of the stem. The lower or fixed jaw

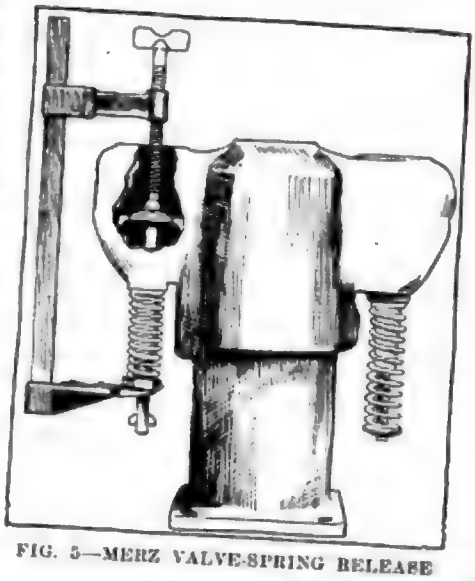


FIG. 5—MERZ VALVE-SPRING RELEASE

is removable to permit it to be stored in the tool box. The sliding jaw slides freely, but binds instantly upon the thumb screw being turned, locking it positively, until the pressure on the thumb screw is relieved, when it again is free to slide. The pivoted pad at the lower portion of the screw is fitted with a lug that fits the slot in the valve head, thus holding the upper portion of the device in center. When set, a few turns of the thumb screw permit the pin to be withdrawn, and the valve removed.

Romort Engine Cleaner

Cleaning the engine is a task that is usually most disagreeable, and for this reason, and the fact that it is enclosed in the hood, out of sight and mind, it is frequently neglected shamefully. The chief reason for this is the crude way in which this operation is usually performed. To take the place of rags and waste in this connection, and do their work more quickly and economically, the Romort engine cleaner is manufactured by the Romort Valve Co., Portland, Ore., as shown in Fig. 7. It consists of a cylindrical trank 20½ inches long by 4 inches in diameter, which holds two quarts of coal-oil. It has a spout at one end, terminating in a fine nozzle. At the other end, an air connection is situated. In use the tank is filled with the fluid, and the air line from a tank or pump is connected to the nipple C. The air is blown through the nozzle, carrying with it a fine spray of fluid, which is projected with great force. It is claimed that this device will clean an engine quickly and easily, and that it will clean the nooks and crevices as thoroughly as the more prominent portions. The air feed is adjustable by means of the packing nut, D, to produce a strong or moderate spray. In using this cleaner, the coal-oil is poured in at the top and the air connection made, when a small and powerful jet of vapor will issue from the nozzle.

A. H. G. Ford Accessories

Manufacturing and selling special accessories for Ford cars is becoming a separate and distinct business. Notable among makers engaging in this sort of specialization is the A. Hazen-Green Co., New York. Lighting outfits, master vibrators, and an oiling system comprise its line. The headlight outfits number three, all electric, taking current direct from the Ford magneto. The outfits are complete in each instance, and the price is remarkably low. One lighting outfit consists of a complete equipment, except lamps, for use as an adapter of regular Ford lamps to electric light. An electric tail lamp is also made, and a master vibrator, the use of which is advised by the

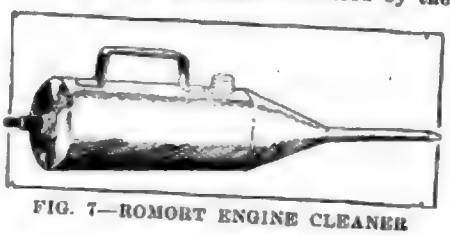


FIG. 7—ROMORT ENGINE CLEANER

maker in connection with the ignition, when current is taken from the magneto for lighting. The oiling outfit is a pressure system, with a sight-feed that is said to enable the driver to know at all times the state of his lubrication. This system does not, it is said, interfere with the regular splash system, but takes the oil supply from the same reservoir.

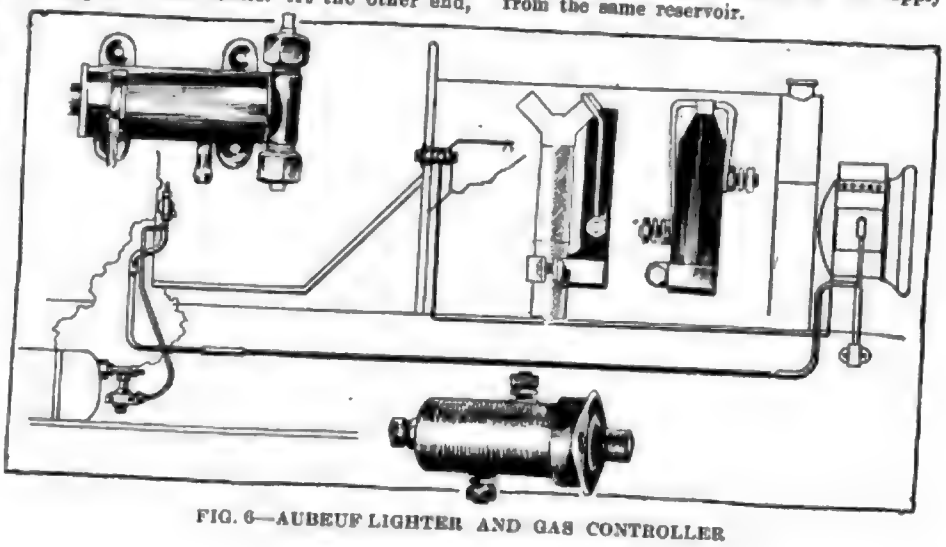


FIG. 6—AUBEUF LIGHTER AND GAS CONTROLLER

Brief Business Announcements

Recent Agencies Appointed by Pleasure Car Manufacturers

Town—	Agent	Car
Able, Neb	Maseck Brothers	Reo
Able, Neb	Maseck Brothers	Little
Ainsworth, Neb	M. L. Smith	Reo
Ainsworth, Neb	M. L. Smith	Little
Albion, Neb	Point & Allen	Reo
Albion, Neb	Point & Allen	Little
Aurora, Ill	O. N. Staley	Abbott-Detroit
Baltimore, O	Neeley & Ensor	Klinekar
Beecher, Ill	H. Wehmhoefer	Abbott-Detroit
Beloit, Wis	L. D. Allen & Co	Abbott-Detroit
Brooklyn, N. Y	C. & C. Auto Co	Klinekar
Buffalo, N. Y	Windsor Motor Car Co	Klinekar
Callaway, Neb	Corothers & Sherrel	Studebaker
Charlotte, N. C	Klinekar	Klinekar
Chicago	Adlake Livery Co	Abbott-Detroit
Chicago	Julius Debita	Abbott-Detroit
Chicago	Barry Garage	R. C. H.
Columbus, O	E. J. Thornton	Winton
Columbus, O	Franklin Cycle & Supply Co	Cole
Columbus, O	Adamson Auto Co	Jackson
Columbus, O	Adamson Auto Co	Detroiter
Columbus, O	Brewer Auto Sales Co	Lion
Corning, N. Y	Max Wolcott Garage	R. C. H.
Crete, Neb	Vaclov Sebek	Cartercar
Danville, Ill	O. E. Newman	Abbott-Detroit
Darlington, Wis	A. C. Poole	Abbott-Detroit
Deerfield, Ill	Deerfield Garage	Abbott-Detroit
Delaware, O	Cook Motor Car Co	Detroiter
Des Moines, Ia	Van Vliet Bradt Motors Co	Moon
Dewitt, Neb	O. W. Wiebel	Cartercar
Dorchester, Neb	John Freehoff	Cartercar
Dorranceton, Pa	Gilbert H. Edgar	Klinekar
Edgar, Neb	Edgar Auto Co	Studebaker
Elgin, Ill	Moody's Garage	Abbott-Detroit
Erwin, Ia	Southall & Hanson	Reo
Erwin, Ia	Southall & Hanson	Little
Fairbury, Neb	Friessed Imp. Co	Studebaker
Fall River, Mass	F. W. Davis & Sons	Cole
Fort Gaines, Ga	W. W. Calhoun	R. C. H.
Franklin, Pa	King Automobile Co	Klinekar
Grand Island, Neb	Jarvis & Boyder	Reo
Grand Island, Neb	Jarvis & Boyder	Little
Haverhill, Mass	Haverhill Motor Car Co	Rambler
Herman, Neb	Schrenk & McDonald	Studebaker
Hinckley, Ill	C. C. Kennedy	Abbott-Detroit
Johnstown, Pa	Atlas Motor Car & Supply Co	Klinekar
Joliet, Ill	Joliet Motor Car Co	Abbott-Detroit
Jonesville, Mich	Grant S. Emery	R. C. H.
Kalamazoo, Mich	Newton Root	R. C. H.
Kasbeer, Ill	Riley & Co	Abbott-Detroit
Kiron, Ia	August Kastner	Lexington
LaGrange, Ill	H. O. Howe	Abbott-Detroit
Lancaster, O	C. E. Pline	Detroiter
Lancaster, Pa	S. E. Bailey & Co	Klinekar
Littletown, Pa	L. M. Alleman	Klinekar
Lima, O	Oakland Co	Oakland
Louisville, Ky	Clark Motor Car Co	Premier
Lowell, Mass	Arthur J. Cummiskey	Stutz
McCool, Neb	Hebreck & Lincoln	Cartercar
Milwaukee, Wis	Bates-Odenbrett Auto. Co	Abbott-Detroit
Massbach, Ill	Rudolph Dittmar	R. C. H.
Minneapolis, Minn	A. F. Chase & Co	Havers
Mt. Sterling, O	Baxter & Neff	Detroiter
Marion, O	Hill & Hipsher	Detroiter
Montreal, Can	E. Rivet	Cartercar
Montreal, Can	Royal Automobile Co	Cole
Maxwell, Neb	O. P. Madsen	Reo
Maxwell, Neb	O. P. Madsen	Little
Newark, N. J	A. N. Brunner	Klinekar
Newberry, Mich	Perry & Westin	R. C. H.
No. Lewisburg, O	Willis Auto Co	Detroiter
Neligh, Neb	C. M. Cassidy	Reo
Neligh, Neb	C. M. Cassidy	Little
Norfolk, Va	C. L. Young	Klinekar
Providence, R. I	Oldsmobile Co. of R. I	Oldsmobile
Palmerton, Pa	K. W. R. Detwiller	R. C. H.
Philadelphia, Pa	Klinekar Sales Co	Klinekar
Pittsburgh, Pa	Klinekar Motor Co	Klinekar
Pawtucket, R. I	Pawtucket Auto Co	Cole
Reading, Pa	D. B. Hoffer & Sons	Klinekar
Richmond, Va	Foster Motor Car Co	Klinekar
Rockford, Ill	F. L. Miller Auto Co	Abbott-Detroit
Roseland, Ill	A. Vincent & Sons	Abbott-Detroit
Rockwood, Pa	P. E. Weimer	R. C. H.
Stratton, Colo	A. S. Baker & Son	R. C. H.
San Francisco, Cal	F. O. Renstrom	Klinekar
Springfield, Mass	Maynard Rubber Co	Studebaker
Sumner, Neb	D. J. Yost	Maxwell
Sidney, Neb	Livona & Son	Reo
Sidney, Neb	Livona & Son	Little
Scranton, Pa	A. J. Schnell	Klinekar
So. Omaha, Neb	Holmes-Atkins Co	Lexington
Urbana, O	Only Garage	Detroiter
Utica, O	H. E. Edwards	Detroiter
Urbana, O	Dallas McCrery, Jr	Mitchell
Utica, Neb	P. S. Boone	Cartercar
Valentine, Neb	G. S. Brown	Studebaker
Venango, Neb	C. M. Weyerds	Studebaker
Worcester, Mass	Palace Auto Station	Cole
Walnut, Ill	J. C. Burchell	Abbott-Detroit
Williamsburg, Pa	V. H. Hancuff and E. Shelly	R. C. H.
Wilber, Neb	Kohout & Greer	Maxwell
Waterloo, Ia	Corn Belt Auto Co	Hupp-Yeats
York, Neb	Mulick Manufacturing Co	Cartercar
Youngstown, O	Thomas Motor Car Co	Klinekar
Yutan, Neb	J. W. Schlesinger	Studebaker
Zanesville, O	Valley Motor Co	Cadillac

SASKATOON, SASK.—V. G. Graham has opened a garage here.

San Francisco, Cal.—R. L. Forsyth has been appointed sales manager of the Thomas Flyer Co., a retailing car agency in San Francisco.

Indianapolis, Ind.—H. C. Waite, formerly factory manager of the G & J Tire Co. at Indianapolis, has been appointed general manager of the Reeve Rubber Co., Providence, R. I.

Akron, O.—The Buckeye Rubber Co. will soon start the erection of a one-story brick and concrete addition to its factory which will be 40 by 120 feet. More room is needed because of a growing business.

Columbus, O.—The Maxwell-Interstate Co. has been formed by Ross Shaw and James Westwater, to act as agent for the Maxwell and Inter-State lines in central Ohio. The concern is located at 248 North Fourth street, where the United Motors-Columbus Co. is housed. The Maxwell-Inter-State Co. has Franklin county on the Maxwell and sixteen counties for the Inter-State.

Scott, Sask.—William Hook has purchased a garage here.

Seattle, Wash.—H. P. Grant is back in the industry and has established a garage and repair shop at 1423 Tenth avenue.

Indianapolis, Ind.—H. A. Elmer, president and general manager of the Grant Motor Car Co., has resigned. His future plans have not yet been divulged.

Washington, D. C.—The Henderson-Rowe Auto Co. has been formed to take over the business of Theo. Barnes, Jr., & Co., Pullman agents. The new company has leased a salesroom at 1127 Fourteenth street and will add the Little to its line.

Philadelphia, Pa.—The Tioga Automobile Co., 332 North Broad street, distributor of the National and Hupmobile cars, has removed to its new sales and service building, southeast corner of Broad and Tioga streets. The vacated quarters at 332 North Broad street have been taken by the Wallace Automobile Co., with the Pope-Hartford.

Buffalo, N. Y.—The Iroquois Rubber Co. is agent now for the G & J tire.

Portland, Ore.—Herbert L. Wilson has recently been appointed western Washington representative of the Studebaker Corporation.

Toronto, Ont.—The Rambler agency for Toronto and vicinity has recently been taken over by C. A. Finzel, late manager of the White American Sales Co., Toronto.

Portland, Ore.—The new Stutz agency has opened on Portland's row in the Winton building at Twenty-third and Washington streets. H. I. Mann, of Portland, is the president and F. J. Finger is sales manager.

Baltimore, Md.—Several more Detroiter agencies have been placed by Manager R. H. Croxton, of the Detroiter-Baltimore Co., representing the Detroiter car in Maryland and Virginia. He established an agency with Clarence Winstead to represent the Detroiter in three counties of

North Carolina, with Elm City as the headquarters.

Toronto, Ont.—The Prest-O-Lite Co., of Indianapolis, has opened a branch at 722 Yonge street.

Stockton, Cal.—Hanke & Gall, distributors for San Joaquin county, Cal., for the Haynes car, are to erect a new garage at Stockton

Columbus, O.—The Broad-Oak Automobile Co., located at 622 Oak street, which was recently taken over by William J. Miller and R. M. Weaver, has opened a repair shop.

Vancouver, B. C.—Bert Ford and T. G. Forshaw, of the B. C. Auto Co., have just been appointed special factory representatives in British Columbia for the Cole Motor Car Co., of Indianapolis, Ind.

San Francisco, Cal.—The Federal Rubber and Mfg. Co. will shortly open a factory branch in San Francisco, which will be in charge of E. L. Rettig, for the past 12 years connected with the Diamond Rubber Co.

Eureka, Ill.—Stumpf & Unsicker, of Eureka, Overland agents, are building a new brick garage 50 by 110 feet. The Eureka Motor Co., E-M-F agent, is erecting a new brick fire-proof garage 50 by 105 feet.

San Francisco, Cal.—The Imperial Automobile Co. is the latest motor car manufacturer to establish a factory branch in San Francisco. G. A. Troutt will take over the Imperial interests for the entire Pacific coast.

Boston, Mass.—E. L. Vail, for the past 4 years manager of the Boston branch of the Splitdorf Co., has resigned, and is now associated with the Hoffecker company as sales manager of the Hoffecker speedometer.

Washington, D. C.—The Storm Motor Co., which has had the agency for the Hudson and National, has gone out of business. The Hudson agency has been taken over by R. A. Klock and a number of other business men, who will form a company to handle that car in addition to the Columbia and Hupp-Yeats electric.

Washington, D. C.—Fred L. Harveycutter and Thornton Chesley have purchased the branch business of the Kelly-Springfield Tire Co., 1730 Fourteenth street, N. W., and will conduct it under the name of the Kelly-Springfield Tire Co. Harveycutter formerly was manager for George Meeley, agent for Firestone tires.

New Orleans, La.—With a capitalization of $1,000,000 the Ezeride Filler Co. has been incorporated under the laws of Louisiana. The offices of the company have been opened at their plant here. The company will exploit the patents of the late Edward J. Larkin. The officers of the new company are Ruffin R. Barrow, president; Gordon S. Orme, first vice-president; John H. Fulton, second vice-president; J. F. Anderson, secretary. These with Daniel D. Curran, Harry H. Osborn and J. Blanc Morgan form the board of directors.

Vancouver, B. C.—The A. Walker Auto Co. is now located in the new quarters, 1840 Georgia street.

Brandon, Man.—A two-story brick garage, measuring 60 by 120 feet, is to be erected here for Denison Brothers on Seventh street.

Buffalo, N. Y.—S. E. Hickman has been appointed Stevens-Duryea special representative for the Buffalo territory, with offices in the Hotel Lafayette.

Baltimore, Md.—The Rittenhouse-Winterson Co., which represents the Cartercar and Seitz truck in Maryland, has moved to new and larger quarters at 602 Water street.

Indianapolis, Ind.—Harlow Hyde, late of the Cole Motor Car Co., Indianapolis, and previously advertising manager of the Bosch Magneto Co., has been made advertising manager of the Empire Automobile Co., Indianapolis.

Vancouver, B. C.—To take up his new duties as manager of the local Goodyear tire branch E. C. McConnell, formerly manager of this concern's store in Calgary, has arrived in this city. Mr. McConnell succeeds F. C. Geary.

Washington, D. C.—The Auto Exchange and Supply Co., 1722 Fourteenth street, N. W., has changed its name to the Washington Car Equipment Co., and will shortly remove to larger quarters at 1327 New York avenue, N. W.

Portland, Ore.—J. Stanley Clemens, for a long time manager of the Portland branch of Chandler & Lyons, accessory dealers, has resigned and will enter the retail car business in Portland. His successor is George E. Johnson, of Seattle.

Washington, D. C.—Robert H. Martin has been appointed manager of the Buick Motor Co.'s branch at 1028 Connecticut avenue, N. W., succeeding T. S. Johnson, who has been made eastern sales manager of the Republic Motor Co.

Savannah, Ga.—The Atlanta Taxicab Co., recently placed in the hands of a receiver by the superior court of Fulton county, has voluntarily surrendered its charter. Elliott E. Cheatham, who had been named temporary receiver for the company, was made permanent receiver.

Syracuse, N. Y.—A transfer of importance locally is announced in the purchase by C. Arthur Benjamin, Inc., of the James Auto Co. This consolidates two of the largest firms in the city. F. C. Benson, who has been in charge of the James Auto Co., will continue as sales manager, but the Hudson and Little cars, the agencies for which have been handled by the James Auto Co., will be sold at the Benjamin sales rooms, 410 West Onondaga street. The sales rooms of the James company in Taylor street will be continued as a service station and repair work, etc., will continue there. The repair department of the Benjamin plant will be supplanted by a corner show room.

Picton, N. S.—Dodd Dwyer has opened a garage, accessory station and motor livery on Creighton street.

Vernon, B. C.—George B. Forsythe and associates of this city are erecting a new garage which will be opened in the near future. The concern will handle the Ford line for the territory.

Madison, Wis.—The Galena-Signal Oil Co., a Pennsylvania corporation capitalized at $10,000,000, has filed articles and a statement to do business in Wisconsin. The local interest is given at $10,775.

Moose Jaw, Sask.—The Canadian garage of this city is building new premises at the corner of Tenth and High streets. The structure will be two stories—to be increased to six—of re-enforced concrete, measuring 72 by 75 feet, and will cost $25,000.

Vancouver, B. C.—To Vancouver's already large list of garages there is still to be another added. Work has been begun on the new $50,000 garage to be erected by the Tudhope Motor Car Co. at the corner of Fifth avenue and Granville street.

Elmira, N. Y.—Roy C. Stage, proprietor of the Electric garage, has filed a voluntary petition in bankruptcy in the United States district court. His liabilities were listed at $1,341.34 with assets of $499.63. Among the creditors is the Diamond Rubber Co.

Los Angeles, Cal.—H. O. Harrison has announced plans for a large two-story garage and salesroom to be built in Los Angeles. The new building will be at the corner of Pico and Flower streets. Harrison has also secured the Flanders line for the state of California.

Columbus, O.—The J. C. Sherwood Rubber Co., which was incorporated recently with a capital of $20,000, will handle the U. S. tires in central Ohio territory. The place of business is located at Fourth and Chestnut streets and J. C. Sherwood is president of the company.

Washington, D. C.—The Dupont Garage Co., conducting a garage at 2020 M street, N. W., has organized a sales department and will handle the Hudson, Columbia and Hupp-Yeats electric. R. A. Klock, formerly with the United Motor Washington Co., will be manager and the sales department will be located at 1321 Fourteenth street, N. W.

San Francisco, Cal.—Work on the new Don Lee Cadillac home at California street and Van Ness avenue, San Francisco, is progressing and will soon be ready for occupancy. The Don Lee company is in its new building in Los Angeles, and work will start at once on the branch house in Sacramento. The Fresno branch is completed. The Los Angeles building is three stories in height, and in addition to a garage, shop and salesroom there will be upholstery,

body building and painting departments on the upper floor.

Yorkton, Sask.—J. E. D'Oust has opened a garage and machine shop. The building measures 30 by 50 feet.

Buffalo, N. Y.—The new factory building and sales branch of the Buffalo Electric Vehicle Co., at 1219-1223 Main street, have been opened.

Vancouver, B. C.—O. J. Fox, 975 Main street, has taken the agency for the Dayton truck, and as soon as he can wind up the affairs of Fox Brothers will devote his time to the new venture.

Washington, D. C.—J. H. Earle, formerly of Earle & Allen, a firm that was dissolved several months ago, has secured the Oakland agency and will have quarters with M. T. Pollock, who handles the Oldsmobile at 1018 Connecticut avenue, N. W.

Vancouver, B. C.—The demand among motorists of Vancouver and tributary territory for the latest Oldsmobile cars and Kelly trucks has come to a head in the announcement that a large new garage is to be erected by the Archibald Auto Co. at a cost of $30,000.

Portland, Ore.—Bolton, McFarland & Co., Incorporated, is the new firm name of the Marion distributors for the state of Oregon and the southern part of Washington. They succeed the firm known as the Crowe Auto Co., which has had the agency for the Marion and others in the Oregon territory for the past year. L. E. Crowe and H. A. Burgess, who were known by the firm name of the Crowe Auto Co., have secured the southern California agency for the Marion cars and have left to take up their new territory.

Burlington, Wis.—W. V. Smart has been appointed sales manager of the Raymond C. Agner Auto Accessories Co.

Windsor, Ont.—Frank Miermicke has leased the ground floor of the Ferris building at the corner of Pitt and Ferry streets, and opened a garage.

Baltimore, Md.—The Colonial Motor Co., which is holding down the Studebaker line in this section, has taken on the agency for the Universal truck. W. E. Hayes, formerly with the Studebaker factory, is acting as sales manager for the Colonial company.

Canton, O.—Papers have been filed with the secretary of state increasing the capital stock of the Knight Tire and Rubber Co., of Canton, from $500,000 to $1,500,000. The increased capital is for the purpose of making large extensions and improvements at the plant.

Winnipeg, Man.—P. F. Plews and his brother, formerly with the Joseph Maw Co., Winnipeg, have severed their connection with that firm and have taken the agency for the Reo for Winnipeg. The firm will be known as the Plews Automobile Co. of Winnipeg.

Toledo, O.—The Gamble Motor Car Co. is to have a new home. The building now occupied by this concern will be remodeled and enlarged. An addition 60 by 130 feet will be made on the Thirteenth street side which will give a frontage of 130 feet on Thirteenth street and a depth of 100 feet. The Madison avenue front will be entirely remodeled, as will the entire interior of the old part.

Minnedosa, Man.—J. W. Campbell & Son have erected a garage here. It is the first garage to be built in this vicinity.

Washington, D. C.—The Henderson-Rowe Auto Co. has removed from 1222 H street N. W., to 1127 Fourteenth street, N. W. In addition to the Pullman the company will also handle the Little.

Washington, D. C.—The Miller Co. has been formed to handle the Stutz. A sales room will be opened at 1026 Connecticut avenue, N. W., formerly occupied by the Goodyear Tire and Rubber Co.

Buffalo, N. Y.—E. E. Denniston has been appointed by the Stewart Motor Corporation manager for the district covering the states of Illinois, Iowa and Missouri for the new motor truck concern.

Toronto, Ont.—The Maxwell-Stoddard Ontario Co. is one of the new firms entering the field in Toronto. N. D. M. Phillips is vice-president of the company and offices are situated at 475 Spadina avenue.

Toronto, Ont.—W. T. Butler has been appointed Canadian distributor for the Lippard-Stewart commercial car, which was introduced for the first time in this country at the Canadian national exhibition.

Detroit, Mich.—Walter H. Van Deusen, assistant general sales manager of the Abbott Car Co., Detroit, Mich., resigned October 1. After taking a short vacation, it is understood that Mr. Van Deusen will take a position as the head of a corporation now in the process of development.

Recent Incorporations

Acton, Mass.—Davis-King Co., capital stock, $20,000; motor car business; incorporators, A. W. Davis, H. E. Mead, B. A. King.

Atlantic City, N. J.—Holland-Donnelly Co., capital stock, $100,000; to conduct general motor car business; incorporators, E. J. Holland, E. R. Donnelly, G. C. Donnelly, H. L. Gibereen.

Benton, Ill.—Benton Motor Car Co., capital stock, $65,000; to manufacture motor cars and accessories; incorporators, H. Atotlar, W. S. Cantrell, A. H. Feaunfelder.

Boston, Mass.—Ultra Motor Car Co., capital stock, $100,000; incorporators, R. H. Randall, E. A. Bagg, C. A. Parker.

Boston, Mass.—Cosmopolitan Rubber Co., capital stock, $2,500; deal in rubber goods; incorporators, S. Miller, E. Miller, B. Levenson.

Brooklyn, N. Y.—Kings County Automobile Owners' Association, capital stock, $2,000; incorporators, M. M. Homiwich, A. Lenick, L. S. Harris.

Buffalo, N. Y.—Up-to-Date Auto Body & Specialty Co., capital stock, $2,500; incorporators, L. Dreyer, E. H. Dreyer, G. P. Askin.

Charlottesville, Va.—Jefferson Garage Co.; incorporators, W. B. Jones, R. L. Thomas, C. E. Blume, E. L. Thurston.

Charlotte, N. C.—Charlotte Storage Battery & Mfg. Co., capital stock, $100,000; to manufacture batteries; incorporators, J. W. Garrett, B. Garrett, C. A. Duckworth.

Cleveland, O.—Ideal Tool & Specialty Co., capital stock, $15,000; to manufacture accessories; incorporators, J. C. McLeland, G. E. Penty, G. P. Moulton, J. A. Hecker, C. Fuller.

Columbus, O.—Kelly Springfield Motor Truck Co., capital stock, $2,500,000.

Columbus, O.—Columbus Auto Parts Co., capital stock, $25,000; repair business; incorporators, C. J. Krag, R. E. Klages, J. J. Stoddart, W. D. McKinney.

Connersville, Ind.—Lexington Sales Co., capital stock, $100,000; to sell motor car parts; incorporators, M. W. Tichenor, E. B. Lilly, W. M. Place.

Des Moines, Ia.—Van Vliet-Bradt Motors Co., capital stock, $10,000; incorporators, W. E. Moyer, W. J. Bradt, C. G. Van Vliet.

Dayton, O.—McVey Mfg. Co., capital stock, $60,000; to manufacture accessories; incorporators, J. L. McVey, W. C. Fraine, A. N. Burkhart, M. Galloway, R. J. McCarty.

Jacksonville, Fla.—Atkinson Tire & Supply Co., capital stock, $25,000; incorporator, R. L. Atkinson.

Jersey City, N. J.—Delion Tire & Rubber Co., capital stock, $500,000; to manufacture rubber goods; incorporators, H. O. Coughlan, T. K. Mallaby, H. T. Letts.

Joliet, Ill.—Joliet Auto Supply Co., capital stock, $5,000; incorporators, B. S. Moore, T. J. Bracker, J. H. Garnsey.

Lowell, Mass.—Patterson Rubber Co., capital stock, $500,000; deal in tires; incorporators, J. S. Patterson, F. H. Appleton, F. H. Appleton, Jr.

Newark, N. J.—Charles E. Ball, capital stock, $100,000; to deal in motor cars; incorporators, C. E. Ball, Jr., R. Whitlock, S. M. Cady.

Newark, N. J.—American Auto Radiator Works, capital stock, $25,000; to manufacture radiators; incorporators, M. Steiner, A. Marcus.

Newark, N. J.—Continental Garage Co., capital stock, $10,000; incorporators, L. Kirkpatrick, R. C. German, S. A. Young.

New York—Faissole Auto Co., capital stock, $25,000; incorporators, A. Karlin, L. Lapides, A. Faissole.

New York—Bryant Auto Painting Co., capital stock, $2,000; incorporators, A. Berkowitz, B. Davis, P. Ostruk.

New York—Atlas Tire Co., capital stock, $10,000; to manufacture tires; incorporators, R. W. Morrison, R. D. Placak, F. F. Nichols.

New York—Light Car Corp., capital stock, $500; incorporators, J. F. Myers, O. R. Mellon, W. P. Myers.

New York—Reliable Auto Parts Co., capital stock, $2,000; incorporators, A. J. Lunde, H. Hansen, A. Sachroff.

New York—Distributing & Importing Co., capital stock, $100,000; motor car business; incorporators, P. LaCroix, H. T. Andrews, H. A. Miller.

New York—Snowden Rubber Co., capital stock, $1,000; to manufacture tires; incorporators, W. T. Snoden, E. J. Landgraff, A. Sidney Galitzka.

North Tonawanda, N. Y.—Twin City Auto Co., capital stock, $5,000; incorporators, W. A. Arenz, R. LeRoy Herschell, F. J. Wallenberg.

Oak Park, Ill.—Radway Garage Co., capital stock, $6,000; incorporators, J. F. Bambas, H. F. Sinden, C. J. Radway.

Philadelphia, Pa.—Otis Motor Sales Co., capital stock, $10,000; to deal in motor cars; incorporators, E. J. Otis, W. T. Cantwell, T. Harvey.

Portland, Me.—Soule-Smith Co., capital stock, $10,000; to manufacture and deal in motor vehicles; incorporators, W. E. Soule, A. T. Smith.

Richmond, Va.—Auto Lighting Corp., capital stock, $1,500,000; incorporators, A. P. Newcomb, W. Hank, W. J. Simpson, Jr.

Richmond, Va.—National Auto Top Co., capital stock, $15,000; incorporators, G. Crawford, R. V. Merchant, E. R. B. Crawford.

Rock Hill, S. C.—McFadden Auto Co., capital stock, $3,500; incorporators, V. B. McFadden, D. B. McFadden.

Rockford, Ill.—Rockford Motor Truck Co., capital stock, $10,000; to manufacture electric and gasoline motors; incorporators, P. A. Peterson, L. Faust, J. Ledin.

St. Louis, Mo.—Cadillac Automobile Co., capital stock, $50,000; to conduct motor car business; incorporators, J. B. Mogown, J. G. McNieve, F. E. McCord.

St. Louis, Mo.—Auto Products Co., capital stock, $25,000; to deal in general supplies, incorporators, W. W. Smoot, E. B. Stinde.

St. Matthews, Ga.—Calhoun Garage, capital stock, $3,000; incorporators, C. H. Culle, N. F. Salley, J. M. Salley.

Washington, D. C.—Pneucar Co., capital stock, $500,000; to manufacture and deal in motor cars.

PHYSICAL REVIEW LETTERS

Franklin and Stevens Win Road Races

Hamlin, After Many Triale, at Last Succeeds in Capturing Los Angeles-Phoenix Desert Contest—Residents sf San Diego Run Rival Event, with Finish at Same Place—Many Fall by the Wayside

PHOENIX, Ariz., Oct. 29—Special telegram—The last two road races of the year have been run and won, the Los Angeles-Phoenix event, 511 miles, being won by Ralph Hamlin in a six-cylinder Franklin, at an average of 28.2 miles per hour, while the San Diego-Phoenix event, 400 miles, was captured by D. C. Campbell at 23.7 miles per hour. The results were as follows:

LOS ANGELES-PHOENIX

Pos. Car and driver	Time
1—Franklin, Hamlin	18:10:22
2—Cadillac, C. Soules	18:54:05
3—National, Fuller	19:45:06
4—Cadillac, Bramlette	23:18:27
5—Cadillac, McKee	23:46:31

Also started: American, Pipher; American, Bunnell; Simplex, Faulkner; Hupmobile, Jones; Buick, L. Nikrent; Mercedes, Bigelow; Schacht, Bell.

SAN DIEGO-PHOENIX

Pos. Car and driver	Time
1—Stevens-Duryea, Campbell	16:49:20
2—National, Houston	18:55:00
3—Apperson, Ferguson	19:07:29
4—Mitchell, Greer	21:16:00
5—Kisselkar, Coop	22:47:52
6—Stutz, Washburn	38:50:00
7—Simplex, Rice	58:53:00

Also started: Buick, Campbell; Mercedes, Johnson; Pope-Hartford, Griffith; Franklin, Carlson; Studebaker, Wood; Columbia, Smith; Knox, De Lovelace; Pope-Toledo, Ballert; Tincher, Lees; Winton, Carlson; Premier, Fernando; Michigan, Gilstrap; Buick, Biggs; Kisselkar, Chenowith.

Details of the Races

After battling a way across oceans of sand and mud, through raging torrents and over mesas where the roads had been obliterated by one of the most severe storms in the history of the southwest. Hamlin yesterday realized life's greatest ambition when he drove his Franklin six-cylinder to victory in the fifth Los Angeles-Phoenix road race. Five of the twelve cars entered in the race finished. All three of the Cadillacs entered were among the five cars to finish.

Hamlin took the lead just beyond Brawley and held it to the end. His time into Yuma was 10 hours and 32 minutes. The cars finished at Phoenix in the same order they arrived at the Yuma control. For 5 years Hamlin has been trying to win the Phoenix race. Each time he declared he would keep at it till he did win.

The start was made Saturday night in bitter cold. When the cars pulled away from Los Angeles the drivers and mechanicians were wrapped in blankets. A storm had been raging for hours on the desert, and most of the course was muddy but not as bad in California as in Arizona, where the storm was fiercer.

This side of the Colorado, gullies had been washed across roads, which were in places wiped out entirely. Hassayampa river, 50 miles west of Phoenix, and Agua Fria, 16 miles out, were both running bankfull Sunday morning. It was thought an extra control would have to be established at Hassayampa and have the cars finish Tuesday, but Hassayampa went down and mules towed the cars across Agua Fria.

Hamlin changed two tires this side of Yuma, but had no other trouble. Soules had little trouble. The National had only minor difficulties due to the condition of the course. McKee got lost and went 8 miles out of his way. He also changed several tires.

There was only one accident in the race—at Vineyard Curve, near Ontario, Cal., where the Buick overturned. Louis Nikrent, the driver, had three ribs broken. Fred Nikrent, mechanician, also was badly injured. Both will recover.

In avoiding a collision with the Buick, the Mercedes broke a radius rod. The rod was temporarily repaired, but broke several times after that. The car lost about 14 hours from this cause. The Schacht broke a rear axle near Glamis, and lost 14 hours. It arrived in Yuma only 1 hour before the other cars went out of the control. Driver Guy Ball continued, though he knew he was out of the money. He acted as a good Samaritan for machines in the Los Angeles and San Diego races. Otherwise several never would have reached Phoenix. The Schacht and Mercedes arrived late Monday night.

The Simplex had trouble with chains, and was stuck in the mud several times. The driver spent Monday night on the desert 100 miles west of Phoenix. The American, driven by Bunnell, skidded into a viaduct within the city limits of Los Angeles and dished a wheel, which caused the car to quit this side of Brawley. The other American, driven by Pipher, dropped out in the same district supposedly because of axle trouble. The Hupmobile broke an axle near Brawley and was out.

The San Diego Race

Campbell, at the wheel of a Stevens-Duryea, won the race from San Diego in 16:49:20. Nearly all the San Diego cars had some trouble. The course of the two races were different in California, but all cars checked into Yuma and from there on the route was the same. Many San Diego cars never reached Yuma. The Columbia cracked a cylinder and did not get to the control. Near Palomas, on the Arizona side, the carbureter on the San Diego National caught fire and burned out all connections. A delay of 2 hours resulted. The National picked up three nails and changed three tires near Dome. The Apperson got two nails in the same place. The Apperson avoided a rear end collision with the Stevens-Duryea at the expense of a broken radiator. The Stevens was halted and the driver of Apperson, close behind, had to go down into an arroyo or over the bank. He went into the arroyo He smashed a radiator, but soon repaired the damage and finished fourth. The Stutz had much engine trouble.

The Winton was stuck in an arroyo near Arlington and has not arrived. The Pope Hartford broke a frame near Dome and the crew repaired the damage with fence posts and baling wire borrowed while the farmer was not looking. With a fence post on each side and wire swathed around the car, the Pope was a strange sight when it reached Phoenix today.

Five minutes after the San Diego racers left, Mayor James E. Wadham, of that city, and Percy Benbough started in a National and an Abbot-Detroit to make the most rapid run possible to Phoenix. They came straight through without going into the control. Wadham won in 19 hours 35 minutes. The Abbott-Detroit, stuck twice in the mud, finished an hour and a half later.

Descriptions of Courses

The course from Los Angeles is 511 miles in length, while the road from San Diego is just a little more than 400 miles.

For 3 years the race from Los Angeles was across the desert by Mecca, across the Colorado at Ehrenberg, and thence on over the Arizona mesas to Phoenix. Last year it was changed to pass through San Diego and Yuma. This year still another change was made and San Diego was left off the course. On the California side the principal towns through which the route passes are Alhambra, El Monte, Puente, Lemon, Walnut, Spadra, Pomona, Ontario, Bloomington, Colton, Beaumont, Banning, Palm Springs, Mecca, Brawley, Mammoth, Glamis and Ogleby. The Yuma control is the first stop on the Arizona side of the Colorado. It was from this place that the cars in both races started Monday, passing through Dome City, Middle Wells, Palomas, Agua Caliente, Arlington, Buckeye and on to the fair grounds, which are situated on the outskirts of Phoenix.

It is at Yuma that the two race routes converge. The San Diegans raced across the southern California desert by way of El Centro and Holtville.

There is little to choose between the two courses. Up to 2 weeks ago 45 miles of the desert between Holtville and Yuma had never been crossed by a motor car. The first to cross that waste was a Premier, driven by J. L. Fernando, with M. J. Farlow as mechanician. Fernando and Farlow were lost a night and a day on the

desert and had a terrible experience. They encountered sand so deep that even after they had deflated their tires the only way they could progress was to leap out and push from behind, letting the car steer itself.

Before the day of the race the routes were placarded thoroughly. Between Holtville and Yuma there was a flag every 2½ miles and 5 gallons of water.

AVERILL GIVES UP YORK JOB

New York, Oct. 29—H. R. Averill, who has been connected with the Pullman Motor Car Co., of York, Pa., for 6 years as general sales manager, has resigned, the resignation taking effect November 1. Mr. Averill will take a vacation before considering any of the offers he has on hand.

GRAND RAPIDS PROMOTES RUN

Grand Rapids, Mich., Oct. 28—After a 400-mile trip through western Michigan the entrants into the reliability run given under the auspices of the Grand Rapids Herald and the Grand Rapids Automobile Club, pulled into Grand Rapids, bedraggled and mudstained, but with two of the drivers happy in the fact that they had attained perfect scores. The final results showed points penalized as follows:

No.	Car	Driver	Total Penalties
1	Cutting	Rickse	234
2	Reo	Vandecar	0
3	Ford	Vallade	88
7	Cadillac	Eckburg	0
8	Overland	Oswald	868
9	Marmon	Kramer	1
10	Oakland	Austin	0

The first day's run was 114 miles to Ludington. The second day 98.5 miles were covered to Traverse City. The third day was from Traverse City to Cadillac and the fourth day brought the tourists home.

TO TAKE OVER KELLY PLANT

Columbus, O., Oct. 28—The stockholders of the Kelly Springfield Motor Truck Co., Springfield, O., recently incorporated with a capital of $3,500,000 met in Columbus last week and perfected the organization. The new company will take over the plant and business of the Kelly Motor Truck Co. and extensive enlargements and additions have been planned. The new capitalization will be divided $1,000,000 of common and $1,500,000 of 8 per cent cumulative preferred stock; $510,000 of the common stock will be issued at once and $800,000 of the preferred stock will be issued at once. Emerson McMillen & Co., of New York is financing the concern. Of the stock to be issued immediately $19,875 of the common and a like amount of the preferred will be used to acquire the plant from the old corporation.

NEW RUBBER COMPANY RUMORED

Detroit, Mich., Oct. 28—A new rubber company, with a capital stock close to a million, is reported to be planned by interests in this city and in Cleveland. It is proposed to manufacture tires which will be non-puncturable and blow-out proof, and which are the patented invention of Arthur Elliott, of Cleveland. Three patents have been issued to Mr. Elliott covering a lap lock base, straight side walls and steel band inner liner for the tire shoe. It is understood that several rubber men are interested in the venture which is contemplating the building of a factory either in this city or in Cleveland. Negotiations are being carried on here by Charles Ritter, while the Cleveland representatives are the Standard Sales Co.

HUB'S ELECTRIC SHOW OVER

Boston, Mass., Oct. 26—Boston's big electric show closed tonight after 4 weeks of remarkable success during which it is estimated that there were 500,000 people in attendance. And of all the exhibitors who were pleased at the amount of business done none were more so than the men who handle the electric vehicles in Boston. Those dealers who had commercial vehicles alone found that there were innumerable places in New England where business men could utilize trucks. This was brought home to them through the cooperation of the men at the heads of the various electric light plants in the cities and towns of the New England states.

OHIO CREDITORS PROTEST

Cincinnati, O., Oct. 28—Proceeding to place the Ohio Motor Car Co. of this city in bankruptcy were entered yesterday by creditors, who charge the company with consenting to let its business pass into the hands of a receiver, Edward G. Schulz, appointed by the common pleas court a month ago. It is alleged the receivership was brought about by the Diamond Rubber Co. for the purpose of protecting its own claim of $6,000 and was meant to give that concern an advantage over other creditors.

Another accusation is that the Ohio company on May 1 last, being then insolvent, gave the Miami Valley National Bank of Hamilton a bill of sale and chattel mortgage on eleven cars to secure a debt of $11,552 to the bank and later on gave the bank possession of two more cars.

The creditors taking action and demanding that the company shall be declared bankrupt are the Eiseman Magneto Co., with a claim of $1,980; the Bosch Magneto Co., with a claim of $495, and W. D. Byron & Sons, with a claim of $825.

RULING IN SPARK PLUG SUIT

New York, Oct. 30—Special telegram—Judge Hand, of United States district court, has rendered an opinion in the suit instituted by A. R. Mosler & Co., against the Auto Supply Co., for alleged infringement of the Canfield patent, 612,701, covering a type of spark plug which has a recess around the electrode. The opinion sustains the patent within certain narrow limitations but holds that the defendant company is not guilty of infringement.

The reason adopted by the court is based upon the fact that Canfield, a pioneer in the industry, really devised a patentable element when he produced spark plugs of the kind covered by the terms of the patent. Canfield, however, disposed of his patent in 1902 and later it was assigned to the Torbenson company and afterward to the Association Patents Co., subsidiary of the old A. L. A. M. There it remained from 1906 to 1909, when Mosler purchased it.

The ruling that the patent was not infringed is based upon the fact that under the construction of the court Mosler himself manufactured a type of spark plug that came within the claims of the patent long before he acquired any interests in the patent.

GOVERNMENT OPENS TRUCK BIDS

Washington, D. C., Oct. 29—Special telegram—The general supply commission of the federal government today opened bids for furnishing various government departments with motor trucks. While only six trucks will be purchased, it is intended under this opening to use the figures submitted as a basis for further purchases. The amounts of the various bids will not be made public for several days.

Propositions were received from Chase Motor Truck Co., Syracuse; Stewart Motor Truck Corporation, Buffalo; Hupp Motor Car Co., Detroit; Commercial Truck Co. of America, Philadelphia; A. O. Smith Co., Milwaukee; International Motor Co., New York; W. H. McIntyre Co., Auburn, Ind.; General Vehicle Co., Long Island City; Federal Motor Truck Co., Detroit; Baker Motor Vehicle Co., Cleveland; Kissel Motor Car Co., Hartford, Wis.; Congressional Garage Co., Washington; Peerless Motor Transfer Co., Washington; Kentucky Wagon Mfg. Co., Louisville; White Co., Cleveland.

HARTFORD DENIED INJUNCTION

New York, Oct. 29—The United States district court at Trenton, N. J., has denied the motion recently made by the Hartford Suspension Co. for a temporary injunction against the Connecticut Shock Absorber Co. in the suit of the Hartford company against Ellis, an accessory dealer of Newark, N. J., charging infringement of the Traffault patents. The court, however, imposed a bond of $20,000 upon the Connecticut company, despite the fact that the order dismissed the motion for an injunction. The Connecticut company asked leave to intervene and defend the action and the court granted the motion.

The procedure with regard to the reason for asking a bond where the motion for injunction was nominally denied attracted a large amount of interest not only in the industry but among the legal fraternity as well.

MOTOR AGE
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"See America First"

THE American tourist of today is not aware of the scenic fascinations of the great mountain sections of the west; he is not aware of the exhilaration that comes from weeks spent in the foothills of the Rockies, as well as crossing the main ranges through the various passes; he is ignorant of the boundless wealth of the great plateau land between the Rockies and the coast ranges, and he has not grasped the stimulating benefits that come from weeks of out-of-door life in this the great tourists' playground of the American continent.

COLORADO has within her borders more of mountain scenery than all of Europe can boast of. The motorist refrains from touring in Colorado because he considers the roads impossible and is not familiar with the hotel accommodations. The tourist who has spent weeks and traveled from 1,500 to 2,000 miles through the scenic centers of Colorado is amazed at finding the roads through nearly all of the mountain passes better than the roads of the Adirondacks or the White mountains. This is true. The state of Colorado has, through its convict labor system, accomplished wonders in road construction, building roads that are being as scientifically constructed as many of the famed highways through Switzerland; in fact, Colorado is aiming at equaling, if not surpassing, Switzerland by engineering road plans whereby it will be possible to travel through the heart of the Rockies and not encounter grades of over 6 per cent.

TODAY it is possible for a tourist driving himself, and with a party of four, to spend 3 weeks in the heart of the Rockies; to travel during this period 1,500 miles, and to get more vistas of mountain scenery, fathomless canyons and other formations consequent upon mountain ranges than he could obtain in a similar period in the Alpine sections of Europe.

THE trouble with the American tourist today is that he does not know his own country; he does not know the mystic beauties it affords the motorist who seeks the far away fields of western grandeur. Unfortunately, those states that hold in their lap the unexcelled grandeurs of the continent have not advertised these beauties as they should have. They have been content to let American tourists spend their tens of millions annually with the hotels and inns of Europe. Today they are not awakened to the possibilities of turning the tide of touring from our big cities westward.

THE roads are there, the scenery is there, the hotels, to an extent, are there; the directions for the tourist to follow are there, the signboards are more prolific than in New England; but, the tourists are wanting. It remains for the citizens of Colorado, for the citizens of Arizona, for the citizens of Montana, for the citizens of Utah and for the citizens of California and the coast states to unite and proclaim to the American tourist what they have to offer. Without this it is unnatural to expect that the tide of touring will turn to the west as it should.

SEE America First is the watchword that all of these western states should keep constantly before them. Their messages must be carried to the cities of the central west and of the Allegheny slopes. One announcement will not serve to change the course of travel; two will not suffice; a hundred may fail to accomplish the desired results. One thing is certain, namely, that if the great army of American tourists was aware of the phenomenal scenery of the sections referred to, and aware of the relatively good condition of the roads today, and was aware of the reasonable hotel accommodations afforded that there would be millions spent in the west central and mountain states next year which will, unless something is done, be spent in the various countries in Europe.

THE entire country is not aware of the phenomenal strides that have been made in road-building in the mountain sections of Colorado within the last few years. This road enterprise has not been confined solely to highways from city to city, selecting the shortest route; rather scenic roads have been engineered and built especially for the mountain panoramas which they afford. Through the deepest canyons the motorists' narrow stone road is now an accompaniment of the ever-present mountain river or creek, and the pioneering railroad track. Practically all of the more important passes have improved roadways. It is true that these are narrow, but they are adequate. The owner-motorist, who is accustomed to driving his car over the varied roads of the country, will not have any difficulty in a 2-weeks' mountain trip. At times he will skirt apparently fathomless canyons, but there is no immediate danger. At other times he will be far above the timber line, but the roadway is as safe as through the corn fields of Illinois. In a 2-weeks' trip, if he has his car in rational condition, it will not be necessary to have to be towed in a single instance. He will find comfortable hotels and inns within reach nearly every day. He will have no difficulty in purchasing gasoline. He will have no difficulty following routes from place to place; in fact, he will find touring in many of the most beautiful sections of the Rocky mountains as easy as in the central states and some parts of New England.

AMERICA is renowned for her Grand canyon of the Colorado, for her Yellowstone park, for her regions of the cliff dwellers, for her Yosemite and for her countless ranges of mountains, and yet these go begging while the coffers of Europe are annually filled. The remedy lies with the citizens of those states embracing the Rocky mountains and westward. They should co-operate. They should begin at once. They should aim at diverting a fraction of the 1913 tourists' traffic. They should honestly advertise what they have by way of roads, by way of hotels, by way of route books, by way of signboards, by way of garages and get a fraction of the share of American tourists' traffic that they deserve.

BUT you can go further: The wealth of Europe is looking for new touring fields. They have conquered the Alps and their two-score passes; they have made their annual tours through the Tyrols; they have traveled through Scandinavia; they have encroached as far as possible on the boundless Sahara, and today they would come to America if they thought they had rational roads, rational hotels and rational road directions. There is no reason why, with the progress in roads that is being made through Colorado and other states, that this advertisement, See America First, cannot cross the Atlantic, and instead of American millions finding their way into European countries, there will be European money coming to maintain American roads, American hotels and giving to other American industries that percentage of traveling expenses which is sure to follow.

Badgers Proud of Year's Work on Roads

Wisconsin Has Spent $950,000 on Highways so Far in 1912

MILWAUKEE, Wis., Oct. 28—A review of the highway situation in Wisconsin at this time presents a most satisfactory state of affairs. During the past year approximately $950,000 has been expended in permanent highway improvement, and the estimates for next year, based on the demands of the counties for state aid, are in excess of $1,750,000. The report of A. R. Hirst, chief engineer of the Wisconsin state highway commission, shows that the counties are asking $811,150 from the state for permanent work in 1913, as compared with $453,417 demanded for 1912 work. Of course, not all of these demands can be met, as there is provided by law only $350,000 annually, to be distributed pro rata on the basis of the petitions. Only three counties have failed to file petitions for state aid, as against twelve last year.

Engineer Hirst's report shows that about 35 miles of concrete road were constructed during the closing season. The average cost is 90 cents per square yard. Milwaukee county built 12 miles this year, and plans 40 miles in 1913.

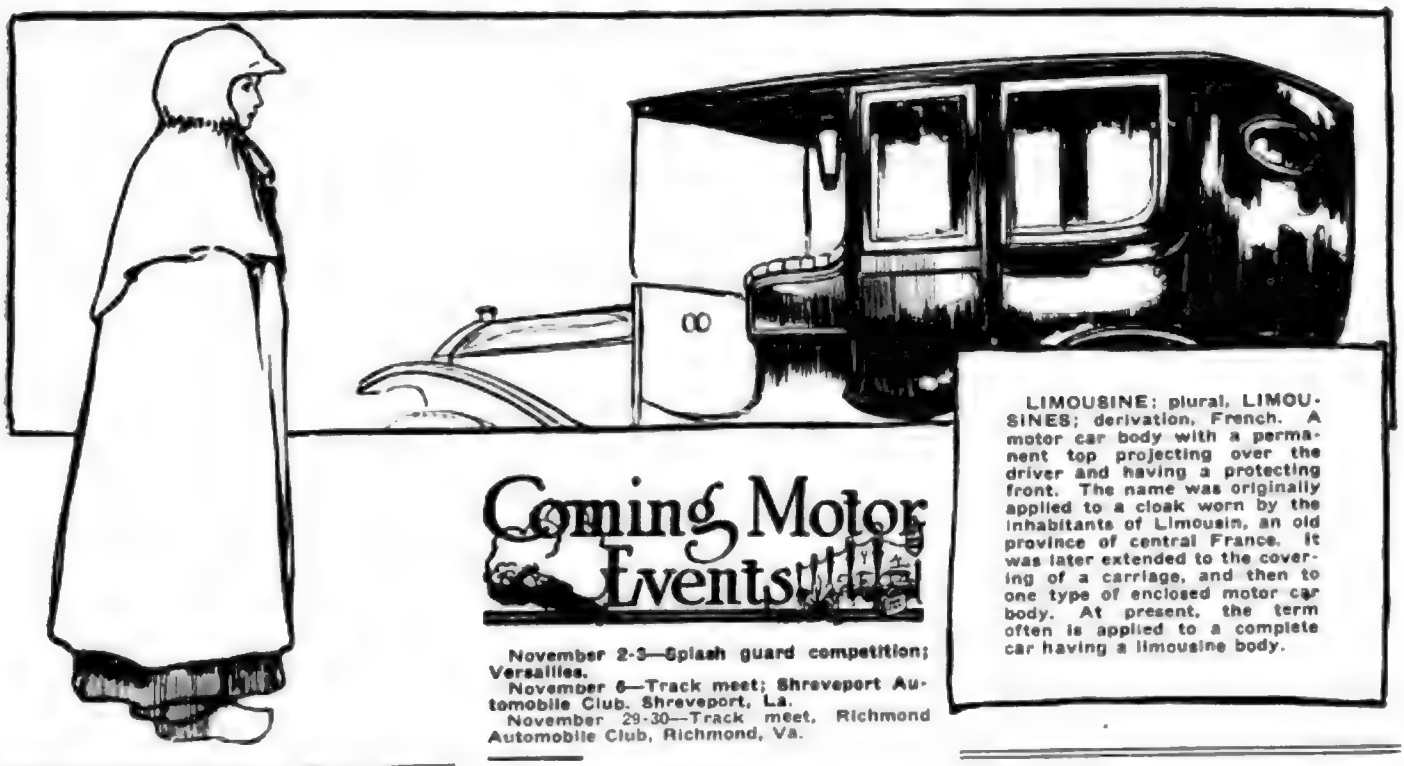
The growth of highway improvement in the newer and poorer counties is a feature of the situation. Florence county, least wealthy county of the state, built 5 miles of the best road in Wisconsin at an expense of $2,500 per mile. The road is constructed of iron ore rock or tailings from the iron mines, 16 feet wide. The road will wear better than iron, says Mr. Hirst.

A permanent road of high class was this year built from Sturgeon Bay to the new state park in Door county, a distance of 21 miles. Door county abounds in limestone and for $1,600 per mile the county has built one of the finest macadam highways in Wisconsin, with but two short gaps in the 21-mile stretch connecting the rest of the state with the new state park.

What can be done by private enterprise is shown by the report of the Oconomowoc-Milwaukee Road Association, the Chicago-Milwaukee Good Roads Association and the Wisconsin Lake-to-River Road Association. The Oconomowoc-Milwaukee body expended $4,457.08 in keeping Blue Mound road, from Milwaukee to the heart of the Waukesha county lake country, in good repair. This amount was raised by popular subscription.

The permanent improvement plan of Milwaukee county is elaborate and will silence critics who declare that Milwaukee county's highways are not only the worst in America, but there seems to be no inclination to improve them. The 12 miles of concrete road built this year will be increased to 52 miles by the end of 1913. A continuous strip of permanent highway will result from the plan to concrete Grand avenue from the Thirty-fifth street city limits to the east end of the new Grand avenue viaduct, the west end continuing in a 120-foot boulevard for a distance of 4,000 feet to Hawley road, which will be concreted from Grand avenue boulevard to Blue Mound road, ¼ mile, and Blue Mound road from Hawley road to the county line, 4¼ miles.

Antecedents of Words Now Part of Motor Phraseology



LIMOUSINE: plural, LIMOUSINES; derivation, French. A motor car body with a permanent top projecting over the driver and having a protecting front. The name was originally applied to a cloak worn by the inhabitants of Limousin, an old province of central France. It was later extended to the covering of a carriage, and then to one type of enclosed motor car body. At present, the term often is applied to a complete car having a limousine body.

Coming Motor Events

November 2-3—Splash guard competition; Versailles.
November 6—Track meet; Shreveport Automobile Club, Shreveport, La.
November 29-30—Track meet, Richmond Automobile Club, Richmond, Va.

SHOWS.

November 8-16—Olympic show; overflow
November 16-23—Show at Atlanta, Ga.
November 13-15—N. A. A. M. meeting, Detroit.
December 7-22—Paris salon.
January 6-11, 1913—Cleveland show.
January 4-11—Montreal show.
January 11-18—New York pleasure car show; Automobile Board of Trade; Madison Square Garden and Grand Central Palace.
January 11-22—Brussels, Belgium, show, Centenary Palace.
January 20-26—New York truck show; Automobile Board of Trade; Grand Central Palace and Madison Square Garden.
January 20-25—Philadelphia show.
January 25-February 1—Montreal, Canada, show.
January 27-February 1—Detroit show.
February 1-March 1—Pleasure car and truck show, Cincinnati, O.
February 1-8—Chicago show.
February 10-15—Chicago Truck show.
February 10-15—Minneapolis show.
February 11-15—Ottawa, N. Y., show.
February 15-22—Newark, N. J. Show
February 16-23—Richmond, Va., show.
February 17-22—Kansas City show.
February 24-March 1—Show, Cincinnati, O.
February 24-March 1—Show at Omaha, Neb.
March 3-8—Pittsburgh show.
March 8-15—Boston pleasure car show.
March 17-22—Buffalo show.
March 19-29—Boston truck show.
March 24-29—Indianapolis show.

W. E. Flanders May Join United Motors

Negotiations Reported to Be Under Way to Bring Detroit Concern and Its President Into Big Holding Company—Vice-President Smith Admits Merger Is Actual Fact—Details of the Deal Not Ready for Publication

DETROIT, Mich., Oct. 30—Special telegram—Rumors which were current in this city during the past week to the effect that Walter E. Flanders had assumed the presidency and general managership of the recently reorganized United States Motors Co., and that the Flanders Motor Co. has been merged with these interests, have assumed tangible form, negotiations to that effect being now under way. The Flanders interests, with a capitalization of nearly $4,000,000, will become a valuable subsidiary of the United States Motors, and it is understood that the latter will assume all the debts and obligations of the Flanders organization.

It is understood that the greater part of the Flanders staff of engineers, advertising men and salesmen will be taken into the combine and that the United States Motors Co. will have available not only the 6,000 Flanders cars built and contracted for, but also the factory facilities of the Flanders concern.

Vice-President Paul Smith, of the Flanders company, stated today that while the merger is an actual fact, no details of the negotiations or the agreement can yet be given out, as nothing definite and final has been done. Mr. Flanders is in the south.

The Flanders Mfg. Co., Pontiac, Mich., is not affected by the merger.

In all probability there will be some definite announcement made in the near future, but it is thought the statement will come out of New York.

HALLADAY PLANS UNDECIDED

Chicago, Oct. 28—No definite policy as to the future has been outlined as yet by the Streator Motor Cor Co., of Streator, Ill., maker of the Halladay, which last week was placed in charge of a receiver, the Central Trust Co. The plant is being operated by the receiver and it is expected that by the end of the week the officers of the company will be in a position to issue a statement as to their plans.

CONSOLIDATED STATEMENT OF ASSETS AND LIABILITIES OF THE UNITED STATES MOTOR CO. UP TO SEPTEMBER

REAL ESTATE, BUILDINGS AND EQUIPMENT—as per the books	$7,858,266.23		
Deduction — Depreciation as per the books	1,473,493.24		
	$6,384,772.99		
Value as a going concern—Appraised by Gunn, Richards & Co.		$4,999,836.31	
Auction value — Appraised by Gunn, Richards & Co.	$2,602,000.00		
REAL ESTATE INVESTMENTS—			
Columbus Circle Realty Co. — Capital Stock at par—as per the books	$ 112,000.00		
Improvements made on premises owned by Columbus Circle Realty Co — per books	116,311.67		
	$ 228,311.67		
Building and improvements appraised by Gunn, Richards & Co. at $587,737.00; estimated value in the equity based on appraisal	$ 83,520.00		
New Castle Construction Co. — Bonds at par—as per the books; and estimated value, based on appraisal of property by Gunn, Richards & Co.	36,000.00		
		119,520.00	
Total real estate, buildings, machinery and equipment			$ 5,119,356.31
FURNITURE AND FIXTURES—			
Estimated value, as per office employees; appraiser's figures not yet received			
New York office		$ 36,000.00	
Factories		40,000.00	
			76,000.00
INVENTORIES—ESTIMATED—			
At factories, and on consignment from factories, as per actual inventory July 31, 1912, brought to September 11, 1912, by adding purchases and labor and deducting sales—as per books	$5,772,870.52		
Deduction — Reserve for obsolete material, etc., estimated by the comptroller of the company	1,024,831.72		
	$4,748,038.80		
Of this sum less than $275,000.00 is represented by completed new cars.			
Estimated Value: By Messrs. Anthony, Maxwell and Jameson for the company on the basis of a going concern for all factories, all operating, except the Brush			4,500,000.00
On the basis of closing down the Brush and Alden-Sampson factories, $4,100,000.00.			
On the basis of closing down the Brush, Alden-Sampson, Columbia and Dayton fact's, $3,000,000.00.			
ACCOUNTS RECEIVABLE—Not including inter-company accounts—as per books		$ 661,257.22	
Deduction—Reserve for doubtful accounts—as per books		73,010.70	
		$ 588,246.52	
Estimated value			550,000.00
NOTES RECEIVABLE — In hands of treasurer—as per books		$ 55,406.44	
Estimated value			34,630.29
CASH IN HAND AND ON DEPOSIT			412,027.80
CASH—Special to provide for dealers' deposits. This fund stands to credit of U. S. Motor Co. in banks as "special fund"			62,513.24
PREPAID EXPENSES: Insurance premiums—unexpired proportion—estimated value			45,440.21
Total assents other than inter-company accounts			$10,800,167.78
INTER COMPANY ACCOUNTS—			
Accounts receivable—Due from factories to U. S. Motor Co. and other inter-company accounts all in receivership		$4,789,713.56	
Offset by Habilities to companies in receivership of equal amount.		4,789,713.56	
Accounts receivable—Due by branch selling companies on notes assigned to banks with endorsement		$1,303,838.25	
Unassigned notes and open account.		2,066,844.03	
		$3,370,682.28	

Court Affairs of the United Motors

Deposits Ordered Returned to Dealers—Receivers Recommend That All Plants Except Maxwell Trio Be Closed Down and Ask Permission to Issue $1,500,000 Worth of Certificates to Finance Manufacturing Schedule of 1913

NEW YORK, Oct. 29—Great activity has been displayed the past week in the affairs of the United States Motor Co. In chronological order the happenings are herewith recorded:

Court orders deposits returned to dealers; provides for settlement of claims that arose between extension and receivership, in all $133,000.

Receivers recommend that all plants be closed down except Maxwell trio and ask permission to issue $1,500,000 of receivers' certificates to finance manufacturing schedule of 1913.

Certificates are a lien on all property, but must be applied first to other assets than those of the three Maxwell plants.

Application for a general demurrer to the jurisdiction of the court is filed on behalf of Frederick D. Bond, acting for some minority stockholders.

Walter E. Flanders and the United States Motor Co. are making examinations of each other's properties in contemplation of a merger when the court tangle is settled.

Court orders form of decree of sale be settled and discussed November 11.

The Week's Doings

Roberts Walker and W. E. S. Strong, receivers of the United States Motor Co., presented their report to Judge Charles M. Hough, of the United States district court, on Monday, recommending that manufacturing of cars be abandoned in all the plants of the company except the three belonging to the Maxwell-Brisco Motor Co., and that the court should give permission for the issuance of a maximum sum of $1,500,000 of receivers' certificates to finance the beginning of the Maxwell 1913 activities.

Not a word was said officially concerning any reorganization and as far as surface indications go, all parties in interest contemplate proceeding toward a sale as the culmination of the present suit in equity which was instituted by the Brown

11, 1912, AS A GOING CONCERN, AS ISSUED BY THE RECEIVERS, W. E. S. STRONG AND ROBERT WALKER

Estimated value of the entire debt, assigned and unassigned, $1,954,995.72		
Estimated value of the entire debt so far as unassigned		1,198,769.54
Notes receivable—E. R. Thomas Motor Car Co.	$ 5,000.00	
Estimated value, problematical		2,000.00
Accounts receivable—National Motors Co.—estimated value par		4,042.23
Accounts receivable—Providence Engineering Works—as per the books disputed	$ 189,923.53	
Estimated value		
Total assets, other than securities owned—going concern value		$12,004,979.53
SECURITIES OWNED IN OTHER CONTROLLED COMPANIES—		
Briscoe Mfg. Co. Par value of capital stock owned	$ 310,000.00	
Estimated value, over and above amounts due from U. S. Motor Co.		367,995.00
Appraisal of real estate, buildings, machinery, etc., by Gunn, Richards & Co., as a going concern $166,995.00, and auction value $121,000.00		
Providence Engineering Works Par value of capital stock owned	$ 500,000.00	
Estimated value, problematical		1.00
Appraisal of real estate and buildings, by S. A. Nightingale & Co., not including machinery, to amount of $91,021.00		
E. R. Thomas Motor Car Co. Par value of capital stock owned	$2,400,000.00	
Estimated value		
Courier Car Co. Par value of capital stock owned	$ 500.00	
This company has no assets—estimated value		
National Motors Co. Par value of capital stock owned	$ 849,600.00	
Estimated value based on equity in real estate at Boston, Mass.; New Castle, Ind.; equity in certain branch selling companies, cash; receivables, etc.		355,190.07
TOTAL ASSETS, ESTIMATED VALUE		$12,728,165.60

AGGREGATE LIABILITIES

Real estate mortgages		$ 164,540.00
Debenture bonds, bond scrip and interest		6,181,509.87
NOTES OF ONE OR MORE OF THE SUBSIDIARY COMPANIES—		
Endorsed by the U. S. Motor Co., and notes of one or more of the branch selling companies endorsed by the U. S. Motor Co., with interest		*2,104,258.12
NOTES OF U. S. MOTOR CO.—		
Endorsed by one or more of the subsidiary companies		650,820.99
CLAIMS AGAINST THE U. S. MOTOR CO. ONLY—		
Of this sum approximately $100,000 is due for goods delivered immediately prior to receivership		1,961,875.99
Claim against Columbia Motor Car Co., or U. S. Motor Co., or both		91,789.60
Notes secured by sight draft on car shipments		63,691.26
Wages of employes and accrued expenses		74,256.30
Dealers' deposits—partly offset by accounts receivable		55,113.24
Contingent liability on endorsement of notes of E. R. Thomas Motor Car Co.		†400,000.00
PROVIDENCE ENGINEERING WORKS—		
Claim made for work performed disputed	$ 138,532.26	
Total liabilities other than inter-company		$11,817,856.27
INTER-COMPANY ACCOUNTS—		
Briscoe Mfg. Co.	$ 313,070.91	
The capital stock of this company is owned entirely by the U. S. Motor Co., and, as the Briscoe Mfg. Co. is regarded as a solvent company, this liability is taken at		
EXCESS ASSETS—		
Estimated value as shown over liabilities as shown		910,309.33
CAPITAL STOCK NOT INCLUDED IN THIS STATEMENT OUTSTANDING OUTSIDE OWNERSHIP—		
U. S. Motor Co., preferred	$11,499,733.33	
U. S. Motor Co., common	12,200,350.00	
Columbia Motor Car Co., preferred	13,400.00	
Columbia Motor Car Co., common	118,000.00	
	$23,837,483.33	
Total		$12,728,165.60

* It is estimated that the branch selling houses can pay $756,226.18 on their notes, after providing for their local indebtedness.

† The receivers of the E. R. Thomas Motor Car Co. estimate that that company will pay from 25 to 40 per cent to its creditors.

& Sharpe Mfg. Co. Mr. Walker read the receivers' report, which was very voluminous, covering forty pages of closely written manuscript. The report described in detail the physical and financial condition of all the properties of the United States Motor Co. as outlined in the balance sheet on pages 16 and 17.

The recommendations of the receivers, so far as finance is concerned, were included in the following list:

To provide for the liquidation of selling companies and the full payment of the local creditors of such selling companies and of the dealers who dealt with such selling companies, where deemed advisable by the receivers.

The indebtedness to local creditors of the selling companies referred to amount to about $140,000 after setting off certain credits. The amount owing to dealers who did business with the selling companies is in the neighborhood of $120,000 net. In all, permission to pay $260,000 net was asked by the receivers on account of the selling companies. It was indicated that such a move would be good business for the embarrassed company because of the valuable assets that would be added to the estate after settlement of the scattered debts of the selling companies; that it would serve to continue the good will, an intangible but valuable element in the situation, and that in case of continuance of the business it would make a favorable sale easier than if the usual outlet for manufactured product was eliminated.

The second recommendation was for payment in full to the dealers who made deposits with the United States Motor Co.

Returning Dealers' Deposits

It was shown that the company held about $63,000 of such deposits and that just prior to the receivership a virtual trust fund was deposited by the company in the Central Trust Co. to provide for the protection of the dealers. The court was asked to construe this fund as a trust fund for the benefit of the dealers. It also was shown that there were certain credits of the company that should be charged against this fund, making the total net amount due the dealers about $29,000. This would leave a credit of about $33,000 for the estate.

The third recommendation was for payment in such manner as may be ordered by this court to creditors who shipped goods or furnished materials or services to the company just prior to the receivership. In this regard it was shown that claims for about $100,000 had accrued between the time certain materials were shipped to the company or services rendered the company and the appointment of the receivers.

Under the working agreement of the creditors as outlined in their letter of June 18, it was provided that all current indebtednesses of the company should be paid in cash upon delivery. The amount covered by the class of claims included in the recommendation represents materials and services contracted for under the creditors' agreement that fell due after the receivers took possession. They could not be paid by the receivers without permission of the court.

The fourth recommendation was for continuance of the business. The receivers reported that the Alden-Sampson and Brush companies were closed down except for sufficient activity to maintain the supply of spare parts likely to be required by the cars in service. The Columbia is completing its manufacturing schedule and the receivers recommend that the plant be closed down as soon as the few remaining cars are finished, except that a certain amount of work should be done in the manufacture of spare parts for cars in service. The Courier Car Co. was pronounced moribund and it was recommended that it remain so for the present.

The Dayton Motor Car Co. was reported to be finishing its manufacturing schedule for 1912 and it was recommended that the plant be closed down as soon as the present work is ended except for the making of spare parts and repair supplies. As far as the three Maxwell factories are concerned, the receivers recommend that they be closed down also by or before December 15, unless provision can be made to finance the 1913 campaign.

In this particular it was shown that the United States Motor Co. had on hand about $500,000 and sufficient quick assets, over and above the amounts asked in the first three recommendations, to make up about $800,000. That sum, with $1,500,000 to be raised by the issuance of receivers' certificates at par, based upon all the assets of the corporation, would in the opinion of the receivers be sufficient to make a good start on manufacturing for 1913 and enough to carry the operations of the company for 3 months.

Must Work Fast

It was pointed out that the element of time is the vital one in the situation and that even with the utmost celerity it will be necessary to proceed at high pressure in order to retrieve the fortunes of the company.

James N. Rosenberg, attorney for the receivers, explained with much clarity to the court that unless a manufacturing schedule was framed and material progress made at once, the effort would prove

Plans for Refinancing R.C.H. Discussed

Creditors' Committee of Nine Appointed to Manage Affairs of Detroit Corporation—Agreement to Be Submitted Stockholders for Ratification Next Month

DETROIT, Mich., Oct. 30—Special telegram—The condition of the business of the R. C. H. Corporation was fully disclosed to the stockholders and merchandise and money creditors at a meeting at the Pontchartrain hotel, on October 25.

The meeting was largely attended, the creditors present representing an indebtedness of $1,600,000. Plans for the refinancing of the company were discussed at length and an agreement was drawn up between the creditors and the R. C. H. corporation whereby the latter's affairs will in the future be in the hands of a creditors' committee of nine, the former directorate consisting of three.

Sixty per cent of the capital stock is to be under the direct control of three men chosen from this committee of nine, under the terms of the agreement. It was pointed out that this was done in order to protect the concern in the event of the death of the Hupp brothers, owners of a large proportion of the stock. This agreement is to be submitted to the stockholders and creditors for their formal ratification November 8, when the directors of the R. C. H. Corporation meet. It is expected that the entire plan will be finally adopted. The six creditors who have been placed on the directorate become practically debenture holders, but it is expected that all obligations will be cleared away within the next 18 months.

The condition of the concern's affairs may best be explained by the fact that it has grown too rapidly for its capitalization.

At the present time the corporation's books show assets over liabilities of $576,000, according to the auditing of MacPherson, Weiss & Co., certified public accountants. Domestic and foreign contracts for some 16,000 cars are in hand, while production at present is normal, the concern having 417 cars in stock in Detroit and in its branches. Materials for about 1,000 more cars are at the factory. During September 617 cars were shipped, while this far this month 342 have left the shops, it is asserted.

By the adoption of this plan the output of the plant will not be curtailed in any way, and at the same time the corporation's financial condition will be made secure, although the members of the new directorate have not yet signed the agreement, all are favorable to it.

It is understood that the following nine will compose the committee: John Kelsey, Kelsey Wheel Co.; J. F. Hartz, C. F. Hall Lamp Co.; H. S. Firestone, Firestone Tire and Rubber Co.; J. H. Clark, attorney; C. A. McCutcheon, American Gear Co.; F. M. Randell, C. H. Fuller Co.; J. H. Sieberling, Goodyear Tire and Rubber Co.; C. P. Sieder, Sieder Mfg. Co., and R. C. Hupp

futile. He said that it was imperatively necessary that there be a volume of cars ready for market in April and May and a fair supply in March and a few in February. This, he said, would be impossible to accomplish unless work was begun practically instanter. The alternative, he pointed out, was that the plants must be closed down and scrapped along with the rest of the properties.

The fifth recommendation was that the court should give such directions as it saw fit respecting the sale of any of the properties or assets.

Object to Fourth Clause

Objection was made by Judge Bisbee on behalf of the Maxwell-Briscoe creditors to the fourth recommendation as outlined by the receivers. Judge Bisbee stated that the Maxwell company was the only solvent concern of the United States Motors and that at a sale as scrap the property would realize enough to pay its debts. He stated that it would work a substantial injustice to his clients in case the recommendation for the issuance of receivers' certificates should be approved, if the operation so financed developed into a failure. He said that the Maxwell creditors could be paid off at forced sale and that there was an element of unjustified chance involved in case of continuance, "where the only solvent company would have to bear the brunt of the risk."

Judge Hough rather leaned toward Judge Bisbee's presentation, and for a time it seemed as if a period would be placed to the affairs of United States Motors.

After recess Judge Hough took up the question and settled the matter by approving the recommendation of the receivers, but ordering that the lien of the receivers' certificates should be first borne by other companies than the Maxwell, and that if, in case of liquidation under the certificates, the properties of the Maxwell company should be applied only to the payment of any balance that might remain after all the other assets had been used to satisfy the liquidation.

Judge Hough's Ruling

Judge Hough's opinion as to the recommendations of the receivers was as follows:

Now with respect to the first application of the receivers which is as follows: The liquidation of selling companies and the full payment of the local creditors of such selling companies and of the dealers who dealt with such selling companies where deemed advisable by the receivers.

No general authority to the receivers to deal with all the selling companies will be given now or at any time. In my opinion circumstances may arise in respect to any selling company, as the word is used in this litigation, rendering it advisable for the receivers to liquidate themselves, to act as their own local courts, so they can pay their own local creditors in full; and the receivers are advised to prepare a separate petition as to each and any selling company which they wish to liquidate in the manner suggested.

The second proposition is in regard to payment in full of dealers who made deposits with the United States Motor Co.

In my judgment there has been sufficiently shown that there was an effort on the part of the motor companies shortly before the appointment of these receivers to create a trust fund for the securing of the said dealers who had not made deposits. Entirely irrespective of any question that might arise about deposits made so soon before the appointment of the receivers, it is in my judgment evidently advantageous from a business standpoint, that the claims of those dealers be settled, by offsetting deposits against amounts due, with the net result that there will become available, as I am informed if I correctly understand the receivers, the net sum of $33,000 approximately out of $62,000 now on deposit which is not now available to them in any case. They are authorized and directed to settle this matter in this way.

As to the third proposition regarding a payment to creditors who shipped goods or furnished materials or services in the interval between the creditors' committee circular of June, 1912, and the appointment of the receivers herein on September 12. As to those creditors it is directed that where the receivers are satisfied that any particular goods were not only furnished but delivered to and used in a certain factory during the period specified, that certain goods and materials may be paid for and charged against that particular factory.

As to the future continuance of the business. It is directed that the receivers have authority for a future continuance of the business along the lines indicated by them in their report. They are authorized to apply for receiver's certificates to an amount not exceeding in the aggregate the $1,500,000 mentioned by them, and in such amounts as they may deem advisable, showing their reasons therefor from time to time, and that upon the issuance of such certificates, and in the order authorizing their issue, it shall be provided that the lien thereof or payment thereof shall be made in the first instance on properties other than those of the Maxwell-Briscoe company to the end that only in the event of all the other property in the hands of the receivers being insufficient to pay the receiver's certificates, shall the property of the Maxwell-Briscoe company be touched. * * *

As to the sale of the property. It is believed that this property ought to be sold as soon as reasonably can be. The receivers in conjunction with the solicitors for the complainant are hereby directed to draft a decree of sale, concerning the form of which I give more specific directions at this time. That they do this as speedily as possible, not pausing to obtain the formal legal descriptions by meets and bounds of the real property, if any be affected, but drafting such a document as shall so show the scheme of sale proposed. That they serve notice of that proposed form of decree upon the attorneys who have appeared here today, as well as upon any who may be on the formal record on the docket of this court, and that for the purpose of discussing that form of decree an adjourned day of this meeting may be fixed. I would think 2 weeks from to-day would be ample time for that purpose.

At headquarters of the United States Motor Co. it was stated that Walter E. Flanders recently had made an inspection and appraisal of the properties of the company, and that representatives of the United States Motor Co. were at present engaged in examining the Flanders plant in Detroit looking toward a consolidation as soon as the legal tangle in the United States district court was unraveled.

Deposits of stock and claims under the proposed plan of reorganization is continuing, and a tentative limit has been set for such deposits on November 9. It is said that the amount deposited already represents a material amount more than a majority.

N. A. A. M. Calls Detroit Meeting

First Mid-Year Session to Be Held November 13-15—Many Prominent Tradesmen Called Upon to Deliver Addresses Pertaining to Industry Before Gathering of Makers

DETROIT, Mich., Oct. 28—The National Association of Automobile Manufacturers has given out the complete program of its first mid-year meeting, which takes place in this city on November 13 to 15. The first day will be devoted to business meetings of the board of directors of the N. A. A. M. and of the Automobile Board of Trade. On the following 2 days, papers by a number of prominent figures in the industry will be read, as follows:

NOVEMBER 14—MORNING.

The National Association—What Has Been Accomplished and What Can Be Accomplished—S. A. Miles.
Multiplicity of Models—G. W. Bennett.
Some Selling Problems—Hugh Chalmers.
Yearly Models—C. C. Hanch.

AFTERNOON

Relation of the Volume of Motor Carriage Business to the Volume of Commercial Car Business—David Beecroft.
The Commercial Car—S. D. Waldon.
Why All Manufacturers Should Use the Standard Warranty—Walter C. White.
Traffic—J. S. Marvin.
Injudicious Methods of Selling Commercial Vehicles—M. L. Pulcher.

NOVEMBER 15—MORNING

Good Roads—R. D. Chapin.
Territory and Discounts—E. R. Benson.
Labor Conditions—H. M. Leland.

NEW DETROIT CONCERNS

Detroit, Mich., Oct. 28—The Phipps Electric Automobile Co. has been organized by Joel G. Phipps for the purpose of manufacturing electric motor cars. Mr. Phipps was formerly general manager of the Grinnell Electric Car Co. A coupe model already has been built by the new concern.

The Detroit Puncturine Co. was recently incorporated in this city. The officers of the concern are M. H. Chamberlain, L. N. Taylor and K. R. Montgomery. The concern manufactures a tire compound which is intended to heal punctures and cuts in the envelope. A small amount of the preparation is put into the tire and in the event of a puncture, is said to flow to the hole, filling it immediately and hardening, preventing any appreciable escape of air.

HAY QUITS FORD SERVICE

Chicago, Oct. 30—Thomas J. Hay, for 7 years manager of the Chicago branch of the Ford Motor Co., created a local sensation by retiring from his position Monday morning. His successor is Dayton Keith, who has been managing the Indianapolis Ford branch. Mr. Hay has several plans in view as to his future, but is not ready to make any statement.

LUCE MAKES A CHANGE

Chicago, Oct. 28—Morton H. Luce, manager of the Chicago Velie branch, has resigned that position to become sales manager for the American and Marion Sales Co. of New York. He will make his headquarters in New York city and will handle territory which includes New York, Pennsylvania, Maryland, Delaware, New Jersey and New England. Luce leaves here November 10.

Autumn Activities of the Motorists

Charles J. Glidden Reaches New Orleans Over Lakes-to-Gulf Route—York Entertains Lancaster Club—DePalma Able to Get Out of Doors—Track Meets at San Antonio and Louisville—Contest Board Rulings

NEW ORLEANS, Oct. 28—Declaring his welcome to New Orleans the most cordial he ever had received in any city, Charles J. Glidden stepped from his 1913 Maxwell here Saturday night at the end of his tour from Detroit, having made the trip on schedule time.

"There were just enough bad roads to make the run interesting," Mr. Glidden said.

New Orleans cars awaited the tourists at Baton Rouge, 100 miles up the river, and extended the first greetings. Every few miles between the state capital and the city other cars came up and took their places in the procession. In the late afternoon a cavalcade a mile long swung into the city and was cheered almost continually during the parade through the business section.

At a banquet Saturday night Mr. Glidden told the story of the trip. There was no doubting that it had been filled with interest for every participant when his narrative was finished. He held that there was no more enticing or healthful recreation and that interest was heightened by the requirements of the tour. This, he said, was his answer to those who said that the tour had outlived its interest.

Trips to points of historical interest and a journey up the river in an old-time steamboat occupied Sunday and Monday. Monday afternoon Mr. Glidden spoke on good roads at a luncheon in his honor at the progressive union. Mr. Glidden favors reversing the route if the tour is held next year, starting from New Orleans instead of Detroit.

YORK ENTERTAINS LANCASTER CLUB

York, Pa., Oct. 28—The track meet here Saturday was attended by about 1,500 persons including many members of the York Motor Club and the Lancaster Motor Club, which held a socialbility run to York and were the guests of the local organization. In the second and third events of the races in which the Klinekar driven by Minher, and the Pullman driven by Gillard there was a close rivalry for first place throughout. Both events were taken by Minher.

The party of about forty members of the Lancaster Motor Club, left Lancaster at 10 o'clock in the morning on the run to York. After checking in at the National hotel the Lancaster party proceeded to the fair grounds to witness the races. The prizes to the Lancaster motorist running to York nearest to the secret time set by Major Frank B. McClain of Lancaster, were awarded during the races by Paul Gilbert, president, of the York club.

The sealed time was 1 hour and 13 minutes. John M. Binkley, Lancaster, in an Overland was awarded the first prize, his time being 1:14¾. E. H. Eshbach, Millersville, in a Regal won second prize. His time was 1:15:10. After witnessing the races the visitors were entertained with a banquet by the York club at its new home along the Wrightsville pike east of the city. Nineteen cars were entered in the run. Summaries of the track meet:

Five miles, for cars under 301 cubic inches—Freitag, Mercer, won; Tambright, Ford, second; Anderson, Pullman, third. Time, 6:29⅘. Also ran, Gillard, Pullman.

Five miles, for cars under 451 cubic inches—Minker, Klinekar, won; Gillard, Pullman, second; Richley, Buick, third. Time, 6:03⅕. Also ran, Freitag, Mercer; Schnaeder, Pratt.

Five miles, for cars under 601 cubic inches—Minker, Klinekar, won; Gillard, Pullman, second; Oden, Simplex, third. Time, 6:08⅖. Also ran, Anderson, Pullman; Schnaeder, Pratt.

Five miles, free-for-all, handicap—Richley, Buick, won; Tambright, Ford, second; Minker, Klinekar, third. Time, 7:09⅘. Also ran, Anderson, Pullman; Gillard, Pullman; Freitag, Mercer; Oden, Simplex.

DE PALMA GETS OUT OF DOORS

Milwaukee, Wis., Oct. 29—Ralph de Palma, winner of the 1912 Vanderbilt cup race, and runner-up to the winner of the 1912 American grand prix until an accident put him out of the running in the last lap, will be able to do without doctors and nurses by the end of the present week. Last Saturday Ralph and Mrs. de Palma were known spectators at the football game between Marquette university and Lawrence college. De Palma sat through the game without feeling it and afterward got to his wheeled chair unassisted and went back to Trinity hospital for the night. On Sunday he was about bright and early and with permission of the physicians he discarded the slow invalid's chair at noon and went down town on crutches with his wife to have dinner in the Hotel Pfister. During the afternoon the couple attended a vaudeville show and took supper down town, returning to the hospital for the night.

The Milwaukee Automobile Dealers' Association is still working to raise funds to cover the $43,000 deficit and is succeeding fairly well.

RESULTS AT LOUISVILLE

Louisville, Ky., Oct. 27—Over the historic 1-mile dirt racing track at Churchill Downs, nine well-contested motor races were run this afternoon. About 3,000 persons witnessed the events. The exhibition of Louis Disbrow, driving his Simplex Zip and his Jay-Eye-See, was the feature. No records were lowered. Summary follows:

Exhibition trials to establish handicaps, 1 mile—Simplex Zip, Disbrow, :53⅘; Case Bullet, Nikrent, :57; Hotchkiss, Klipatrick, :57; Case Tornado, Endicott, :57⅕; Lozier, Martin, 1:05.

Five-mile match race, class E—Nikrent, Case Bullet, won; Endicott, Case Tornado, second. Time, 5:21⅖.

One mile exhibition by Louis Disbrow in Jay-Eye-See. Time, :58.

Australian pursuit race, class E—Disbrow, Simplex Zip, passed Klipatrick, Hotchkiss; Nikrent, Case Bullet, and Endicott, Case Tornado, winning the race in 6 miles. Time, 5:45.

Two miles—Disbrow, driving Jay-Eye-See against southern dirt track record of 1:49⅘. Time, 2:08.

Two-mile event for local cars—Martin, Lozier, won; Filson, White, second. Time, 2:23.

Five miles, free-for-all, class D—Disbrow, Simplex Zip, won; Endicott, Case Tornado, second; Kilpatrick, Hotchkiss, third. Time, 5:22.

Free-for-all handicap, class D, 3 miles—Nikrent, Case Bullet, won; Disbrow, Simplex Zip, second; Martin, Lozier, third. Time.

RACING AT SAN ANTONIO

San Antonio, Tex., Oct. 27—Special telegram—The harvest jubilee 3-day meet came to a successful termination today, the feature being the establishment by Barney Oldfield in his Christie car of a new record of 50⅕ seconds, electrical timing, for 1 mile on a ¾-mile track. The Mercedes, driven by George Clark, won the continuation race on each of 3 days with a total mileage of 129.75 for 2:15:00 elapsed time. No accidents marred the meet, which was seen by the largest crowds ever gathered at the local track. The loop was heavily oiled and the oil was worked in. Raimey's work in the Ohio car was one of the big features. There were purses aggregating $3,000 for the 3 days' racing. Summary of the 3 days' racing:

FIRST DAY

Six miles, class E—Heinemann, Cino, won; Oldfield, Benz, second; Raimey, Ohio, out on seventh lap with engine trouble. Time, 6:01.

Nine miles, class 3C—Heinemann, Cino, won. Raimey, Ohio, second. Time, 9:02⅘.

Nine miles, class 2C—Mosley, Studebaker 20, won; R. Johnson, Studebaker, second; Craig, E-M-F, threw tire and went out on seventh lap. Time, 10:00⅖.

Six miles, class E—Raimey, Ohio, won; Oldfield, Benz, second; Mosley, Studebaker 20, third; Heinemann, Cino, fourth. Time, 6:08.

Mile time trials for track record held by Oldfield, flying start—Oldfield, Christie, :51; Clark, Mercedes, :55⅘; Raimey, Ohio, :58⅘; Heinemann, Cino, :59⅖. 52⅘.

Continuation race, free-for-all, cars to run 45 minutes each day for 3 days, results of first day Clark, Mercedes, fifty-nine laps in 45:41⅘; Mosley, Studebaker, fifty-seven laps in 45:02⅖; Raimey, Ohio, fifty-five laps in 45:28; Craig, E-M-F, forty-nine laps in 45:19; Oldfield, Benz, forty-six laps in 45:29; R. Johnson, Studebaker 20, forty laps in 45:13⅖; Heinemann, Cino, out in twenty-third lap with bad rear wheel.

SECOND DAY

Six miles, class 3 and 4C—Raimey, Ohio, won; Oldfield, Benz, second; Johnson, Studebaker, third. Time, 5:57.

Nine miles, class D—Clark, Mercedes, won; Heinemann, Cino, second; Raimey, Ohio, out on last lap with engine trouble. Time, 8:36.

Nine miles, class E—Johnson, Studebaker, won; Craig, E-M-F, second; Mosley, scratched. Time, 12:00.

Mile trial records—Moore, Buick, :64⅘; Oldfield, Benz, :56; Clark, Mercedes, :54; Oldfield, Christie, :51.

Nine laps, class E—Heinemann, Cino, won; Johnson, Studebaker, second; Ralmey, Ohio, out because of break in feed pipe.

THIRD DAY

Twelve miles, class E, division 300 cubic inches and under—Ralmey, Ohio, won; Mosley, Studebaker 20, second; R. Johnson, Studebaker, third. Time, 11:12⅘.

Six miles, class E, 300-450 cubic inches—Ralmey, Ohio, won; Heinemann, Cino, second. Time, 5:55.

Six miles, class D, free-for-all—Clark, Mercedes, won; Heinemann, Cino, second; Mosley, Studebaker, third. Time, 5:43.

Mile trial—Oldfield, Christie, first in :50⅕; Clark, Mercedes, second, :54 electrical timing. Two starters.

Six miles, class 3C, 300 cubic inches and under—Ralmey, Ohio, won, being flagged off on sixth lap after Cino had thrown a tire. Two starters.

Match race, 9 miles Ralmey, Ohio, won; Oldfield, Benz, second. Time, 9:02⅘.

Continuation race, free-for all, cars to run 45 minutes each day on 3 days, total results—Clark, Mercedes, won, 129¾ miles; Oldfield, Benz, second, 105¾ miles; Ralmey, Ohio, third, 91½ miles. Five starters on last day.

CONTEST BOARD RULINGS

New York, Oct. 28—Several important rulings were made at the meeting of the contest board of the American Automobile Association last week covering appeals, disqualifications, etc. The gist of the rulings follows:

Studebaker Corporation appeal in Minneapolis-Winnipeg run against disqualification for cutting course was dismissed and class trophy awarded to Hupmobile.

The Pittsburgh Mercer Auto Co. was suspended until January 1 for mis-advertising contestants in a non-stock meeting as stock cars.

The George C. Brinkman Motor Car Co., of St. Louis, was suspended until January 1 for failure to start a Nyberg car entered at a recent race meeting.

Charles W. Canner, registered driver, was suspended until January 1, 1915, and E. V. Rickenbacher, January 1, 1914, for participation in various unsanctioned race meetings in Iowa and Nebraska where Canner campaigned the Marshall flying squadron and met with some serious mishaps, owing to the carelessness and disregard of the precautionary rules of A. A. A.

SCHIMPF TROPHY RUN BILLED

New York, Oct. 28—For the second time the Schimpf trophy event under the auspices of the Long Island Automobile Club will be run off November 9. Last year the run attracted quite a field of club men and the prospects for this event are reported promising. The run is a sealed time affair over a course of about 50 miles. The unusual feature of the rules is that the sealed times will be different for everybody in the field and the winner will be determined by the degree of exactness with which he approximates the particular time he selects. Owners must drive.

REBUILDING SPEEDWAY EQUIPMENT

Indianapolis, Ind., Oct. 28—The Indianapolis motor speedway is to tear down the present press stand, judges' stand, refreshment and executive buildings and all other stands grouped near the start and finish line and behind the pits. One large, modern pagoda building is to supplant the entire lot. This building will accommodate those in charge of the race in the following way:

On the lower, or ground floor, will be located the telegraph and electrical appliances. On the second floor will be the timing and scoring devices. The press will be taken care of on the third floor, and on the fourth floor the judges and officials will have high, roomy accommodations. The fifth floor is for the management and executives. Other changes being incorporated by Manager of Events Charles W. Sedwick are the installation of more efficient scoring service and a general improvement in the utilization of parkage and paddock space.

Mr. Sedwick sails about November 1 for Europe, where he will discuss the May race meet with the most prominent European manufacturers.

ASKS MARYLAND RECIPROCITY

Washington, D. C., Oct. 26—Plans are under way to bring about a reciprocal agreement with Maryland, that state having a law which effectually bars Washington motor car owners from using Maryland roads unless they have a Maryland license. The chamber of commerce is investigating the matter through its secretary, and it is also stated that the Touring Club of America will endeavor to bring about some agreement whereby Washington motorists can use the Maryland roads without having to pay the heavy license fees now being charged.

Several means of retaliating for the injustice which Washington motor car owners claim is done them by Maryland have been suggested. The agitation may result in a regulation by the district commissioners or a change in the law, if that is necessary, requiring Maryland motorists to pay the same license fee that is charged district motorists.

The fee here is $2 and the license is good so long as the licensee owns the machine for which it is granted. It is estimated Washington motorists are paying nearly $50,000 per annum for license fees in Maryland, whereas Maryland motorists coming into Washington pay practically nothing, temporary permits being given them without cost. Efforts have several times been made to secure a reciprocal agreement with Maryland, but each time without success, the Maryland authorities being quick to recognize the fact that Maryland offers practically the only outlet for Washington motorists who wish to tour.

In view of the fact that Maryland grants reciprocity to every state in the union but insists upon the District of Columbia paying the full license fee of from $5 to $25 per car, motorists here think some consideration should be given them. They put forth the claim that they spend large sums of money in the state while touring and this fact should be taken into consideration.

The chamber of commerce has determined to sift the matter to the bottom and the agitation is likely to result in a change for the better, which will meet with the approval of all motorists.

ROAD RACE POSSIBLE

Baltimore, Md., Oct. 28—The county commissioners of Frederick county, Md., have endorsed the road race between Frederick and Emmitsburg, that county, by giving permission to those who will drive in the race to operate cars at a speed greater than 25 miles an hour. Motor Vehicle Commissioner Roe said that the race could be run provided the permission of the commissioners was obtained. The race will be held under the auspices of the Frederick News and Emmitsburg Chronicle.

European Tribute to the Late David Loney Bruce-Brown

BRIEF, but brilliant was the career of David Bruce-Brown, killed at Milwaukee while practicing for the grand prix of America, of which he had twice been the winner. Although he had won great fame and popularity at home, David Bruce-Brown was practically unknown in Europe until his appearance in the grand prix last June, in which event he drove a Fiat, led at the end of the first day, and was struggling hard with Boillot for first place on the second, when the breakage of a petrol feed pipe necessitated the taking of fuel away from the pits, and entailed disqualification.

"In the history of racing no finer display than that of the American driver on the Dieppe hairpin turns and before the grandstands has ever been seen. America has long possessed good race drivers, but never before the appearance of Bruce-Brown on the Fiat have they taken part in European events on machines capable of proving their worth.

"Bruce-Brown was typically American in his style of driving—possessed of a craze for speed as soon as the word was given; a man having no mercy for his machine; a driver determined to get the most out of it from beginning to end. But coupled with this wild dash was a consummate skill in the handling of his car which it is given to few men to possess. Bruce-Brown's work at the tire pits at Dieppe undoubtedly was the most brilliant Europe ever has seen. The leading continental drivers, men who have been trained to racing since the earliest days of the motor movement, were commonplace in comparison with the extraordinary combination of wild fury and calm reasoning shown in every movement of the American driver of only 3 or 4 years' racing experience.

"His was a most charming personality, and he conveyed, insensibly, to all who observed him and his doings, the true racing atmosphere. His perfect preparations, the mastery of his car, the absolute absence of anything approaching "playing to the gallery," his extraordinary strength, shown by the way in which he lifted great cans of spirit shoulder high for replenishing his tank, the trained rapidity of his replenishments—all served to convey an impression of earnestness and thoroughness that no other racing driver quite conveyed, the nearest approach being perhaps Boillot. He was a born racing motorist, having all the pluck, power and vim necessary for so arduous a task, and his loss will be greatly felt."—The Motor of England, October 8.

Clearing House

Wiring Diagrams for Battery Lighting—Law Prevents Ideal Plan—Missing Cause is Local—Engineer Defends Opinions on Crank Balance

FRIED REMAINS UNCONVINCED

DETROIT, Mich.—Editor Motor Age—Referring to the criticism in Motor Age October 17 on balancing of motors:

The torque unbalance will be the same in both the regular type four-cylinder four-cycle motor and the new type motor suggested in the article. As explosions occur in both cases every half revolution, the torque effect exerted on the crankshaft will be the same, independent of the position of the cylinders in which they occur. The explosion of the gases does not cause any unbalance as the same force which is exerted on the piston and transmitted to the crankshaft is acting against the top of the combustion chamber, and therefore counterbalances the action on the crankshaft.

The unbalance due to the revolving and reciprocating parts is exerted by the centrifugal force of the crankshaft and the accelerating force of the pistons.

All that I referred to in regard to two-cycle motors was that even a two-cycle engine, which is known to be in bad balance, would be in better balance than the one suggested in the article.—Ernest R. Fried, research department, General Motors Co.

of the floating type to a large extent, with the cheapness of the semi-floating type.

This type differs from the semi-floating type in that the wheels are carried on independent bearings, exterior of the axle tubes, hence the drive-axles carry no wheel load. It differs from the floating type, however, in that the axles are secured rigidly to the wheels. While not quite so elaborate as the floating type, three-quarter-floating axles are so little more complicated than the semi-floating type, and their cost being considerably less than the floating type. See Fig. 3.

The following makers of cars in the $4,000 class use the semi-floating type of rear axle: Packard, Premier, Amplex, Morse, Apperson, Pierce-Arrow, Simplex, White, Fiat, Franklin.

AN OVERLAND MISS

Dayton, Ky.—Editor Motor Age—My car is an Overland, model 61, equipped with the Bosch dual system. On cranking, cylinders 1 and 4 fired, while 2 and 3 got no spark. The spark plugs from 2 and 3 work in 1 and 4. The firing order is 1-4-3-2. The insulation of the cables is good and I can find no short anywhere. I have thoroughly cleaned out the breaker-box. All connections, outside of the magneto, are clean and tight. All connections are just the same as the day previous, when the firing was satisfactory. The breaker-box cones open the platinum points about 3-64 inch. Could the trouble be here? No current is delivered to cylinders 2 and 3, and the trouble seems to be in the magneto. Can Motor Age tell me what to do?—Robert L. Johnson.

Your firing order is not right. It should be 1-3-4-2. This may have something to do with the misfiring. If you are sure of your above statements, your trouble is most likely to be found in the distributor. The contacts are in the form of friction brushes, which should be periodically adjusted for wear, and cleaned. The platinum point opening is right. Since current is delivered as it should be to the other two cylinders, the trouble must be with the connections to cylinders 2 and 3. If your distributor is making contact as it should, you should get a spark in the second and third plugs.

Suggests Wiring Plans

Proposed Systems for Lamp Wiring Criticised by Motor Age and Improvements Outlined

BUFFALO, Minn.—Editor Motor Age—I would like to hear from readers of Motor Age on the merits and demerits of the different systems of wiring, as shown in Figs. 4 and 5. I would like Motor Age's opinion also.—P. G. Liederbach.

The first diagram is to be preferred greatly to the second, as there are no grounds to interfere with ignition. Experience has shown that a lighting system, to operate well and permit the ignition to operate as it should, should not be grounded to the frame. There is also economy in complete insulation, and the expense of the second wire is not great. If carried in looms or tubes there will be no danger of short circuits, and if the insulation on one wire wears off so that it connects with the metal parts of the car, no short circuit will result, as would were the negative circuit grounded. Your diagrams show three switches, one to control the headlights, one for the side lights, and one for the tail and dashlight. Inasmuch as the taillight is never used without the sidelights, there can be no use in separate circuits for them. There is of course an advantage to parallel wiring of the head and side lamps, as the failure of one will not affect the other, but in the taillight circuit the advantage is in favor of series wiring, as the failure of the taillight will cause the extinguishment of the dashlight, which thus acts as an efficient tell-tale. A short-circuit switch may be connected to it so that the failure of the dashlight will not permanently affect the taillight. In some states, such as Illinois, the law requires that the taillight be controlled only from the rear. This feature need not be sacrificed to these requirements, as a separate switch for the tail and dashlights may be installed at the rear of the car, without control at the dash.

Fig. 6, provides a circuit through the dashlight, and the taillight switch. The switch on the dash is a cut-out for the dashlight, but cannot break the circuit. In Fig. 7, the tail and dashlights are controlled by the sidelight switch.

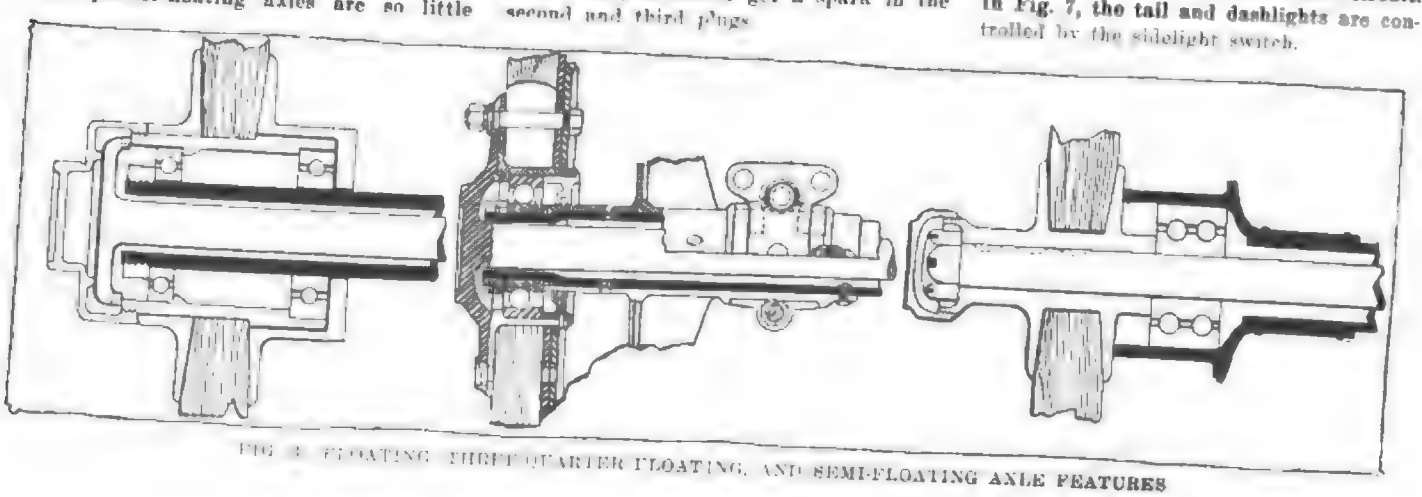


FIG. 3. FLOATING, THREE-QUARTER FLOATING, AND SEMI-FLOATING AXLE FEATURES

Long and Short Stroke

Discussion of Advantages of Popular Engine Type and Elucidation of Valve-Location Status

CALDWELL, Tex.—Editor Motor Age—Will Motor Age kindly explain the advantage of the long-stroke motor over the short stroke?

2—I have heard it said that the long-stroke type delivers more power on low speeds than the short stroke. Is this true and is it true that the long stroke motor uses less gasoline for the same service?

3—Does Motor Age consider a five-bearing crankshaft more efficient and durable than the three-bearing type? Is there less liability of loose bearings in the five-bearing than in the three? Is it not true that it is usually the connecting rod bearings and not the crankshaft bearings that wear first and therefore the number of crankshaft bearings has nothing to do with this trouble?

4—I own a 1912 Overland, model 61, equipped with a Remy magneto. Will it cause the explosion to take place later in the cylinder by turning the notched nut on the magneto to the right?

5—Explain the advantages claimed for the T-head motor over the L head. Also the advantages claimed for the use of overhead valves.—A Reader.

1—The advantages of the long-stroke over the short-stroke type of motor are:

Leverage. Given a certain expansion force within the cylinder, the travel of the piston being longer, and transmitted to a longer crank, it operates on a longer lever.

Greater expansion. Given a charge of a certain volume at the time of ignition, it will expand to a greater volume before the opening of the exhaust valve in a long-stroke motor than in a short-stroke one, thereby using more of the energy generated in the expansion of the gases. The theoretical ideal of any heat engine is to use as nearly 100 per cent of the expansion of the charge within the engine as is possible. This accounts for the greater efficiency of the compound steam engine over that of the single-acting type. This type of engine is substantially an elongated-stroke engine, the only difference being that the low-pressure portion of the stroke is in a different cylinder from the high-pressure portion. In the long stroke engine, this super-expansion takes place in a less degree in the same cylinder, so that at the beginning of the stroke the cylinder is a high-pressure cylinder, and at the lower portion of the stroke, it is a low-pressure one.

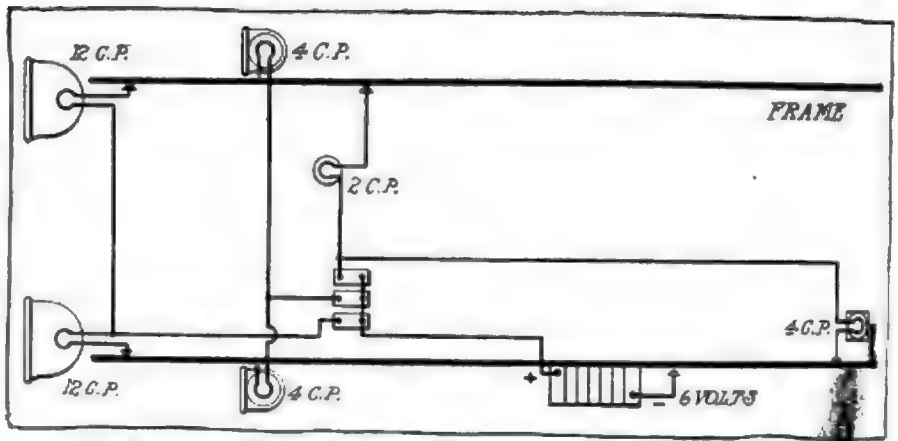


FIG. 4—BAD, THOUGH SIMPLE ELECTRIC LIGHT WIRING PLAN

It has been found in high-speed express locomotive practice that the short-stroke single-expansion engine, while it produces a very low rate of efficiency, and is enormously wasteful, the actual results in high-speed, light-draught work are superior to those of the more efficient type, as only the very cream of the expansive energy is used. This has been found to apply in the same way to gas engines, and for racing work, the short stroke, while less efficient, more wasteful of fuel, and less flexible, has been found to give better results than the long-stroke type. This is the reason why some of the prominent European makers produce stock cars with small bores and long strokes, while their high speed cars are the reverse. Road racers, on the other hand, generally revert to the preponderance of stroke again, as the short-stroke type is not sufficiently flexible to produce good results, unless built in enormously large power-units.

This was well illustrated in the late Milwaukee road races, where even the high horsepower cars were found to have a preponderance of stroke, while the lighter ones were all designed with long strokes. One make, whose sprint cars, designed for excessive speed for short distances—below 150 miles—have larger bores than strokes, while those designed for the long distance high-speed grinds, have longer strokes than bores.

Slower crankshaft speed for the same piston speed: It has been found that speed in revolutions per minute is not an accurate standard by which to gauge the power of a motor; but that piston speed in feet per minute, in combination with bore and number of cylinders, is the true measure of an engine's power. It is thus seen that two engines of the same design except as to stroke, will give the same power, disregarding considerations of expansive efficiency, at equal piston speeds. But the long-stroke motor in reaching the same piston speed as the short-stroke type, will revolve much slower. The advantages of slower speed are, of course, well understood. If compared as to crankshaft speed, the long-stroke type will give greater power.

There are other advantages, but the above are among the most important. In considering them, it must be remembered that the comparison is made in the light of efficiency, which is understood to be made up of the factors: horsepower per gallon of gasoline, horsepower per pound of weight, horsepower per cubic foot of space occupied, durability and flexibility. In a racing motor, this term would not have the same meaning, nor would all racing motors come under the same category, as explained above.

2—As explained in the general statement above, all other things being equal, the long-stroke motor does generate its power at lower crankshaft speeds. They are certainly more economical of gasoline than the short stroke, as is proven by the results of certain European makers in their endeavors to find a type of motor that will give the highest efficiency.

3—There are advantages on both sides of the engine journal question. The advantages of the five-bearing type rest on the fact that there is a longer bearing surface, hence more provision for wear, and less distance between bearings, hence less

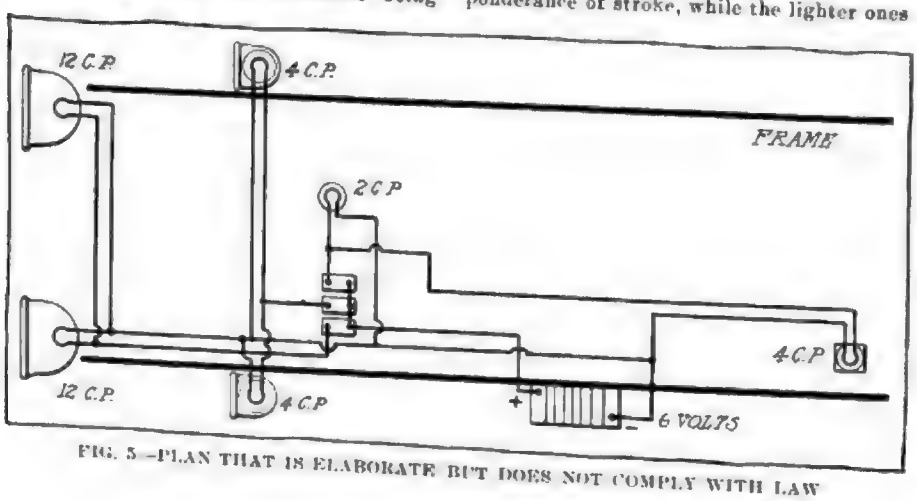


FIG. 5—PLAN THAT IS ELABORATE BUT DOES NOT COMPLY WITH LAW

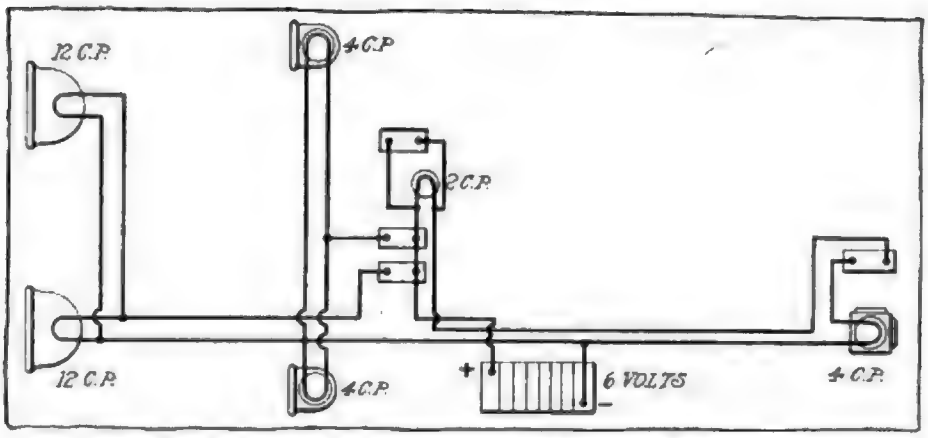


FIG. 6—ELABORATE INSTALLATION THAT COMPLIES WITH LAW

strain on the crankshaft. The advantages of the three-bearing type are that owing to the shorter bearing surface, all other things being equal, it will run freer than the five-bearing type, although the journals will not wear as long.

This is on the same principle as the jeweling of a watch. Friction in these bearings is reduced to the minimum by reducing the bearing surface to a very small area of hard and smooth material. Three-bearing crank bearings should be made of harder metal than five-bearing journals. While the strain on the crankshaft is slightly greater with the fewer bearings, the lining up of the three bearings is easier than the five, and more likely to be right, even in the hands of the most expert assembler or repairman. Thus, while the strain on the crankshaft resulting from piston shock is less severe when five bearings are used, the strain and friction that would result from poor alignment is less likely to be present. The best thing about three-bearing crank-hanging is the saving in expense that this form of construction permits. Your observation in regard to the crank bearings is right.

4—No. This nut adjusts the platinum points on the breaker, the distributor governs the timing. The points should separate about 3-64-inch, on most magnetos, for best results. To alter the degree of advance of retard, the position of the driving gear must be altered.

5—The principal advantage of the T head motor over the L-head is that the valve-area is larger than with the L-head with the valves side-by-side. Another advantage is that the gas has a direct passage from one side of the motor to the other, and the plugs, situated in the inlet valve pocket, are not subjected to a carbon-laden blast of burned gas at the exhaust.

The disadvantages, which you do not ask for, are that the volume of the valve-pockets is increased, thus providing more space for burned gases to lurk in than with the L-head, and that the engine so constructed requires two camshafts and with their gears, bearings and casings, are heavier, for the same power, and much more expensive to manufacture.

A new type of L-head motor has been evolved in recent years that removes the objection to the small size of the valves necessitated in side-by-side location. This type places the valves one over the other in the valve-pocket, or one in the lower portion of the valve-pocket, and the other in the cylinder head. This eliminates objections to both types, while partaking of the advantages of each.

Valve-in-the-head motors have the advantage over these other types in that no pockets are used in the cylinder, making the combustion chamber more nearly the dome, cone, or parabolic shapes that are variously accepted as ideal. The valves in this location are more accessible than in the other types, although their operation involves more complication than the direct-lift types, usually employed on the straight T-head and L-head types. Valves in the head are usually made smaller than those on opposite sides.

MAKERS OF NOVEL SYSTEMS

Joliet, Ill.—Editor Motor Age—I would like to know the names and addresses of the makers of the Manley hydraulic transmission and the Mead rotary valve engine, both of which were described in Motor Age about 3 years ago, and mention of them has been made later, but never the address.—P. Champoux.

The Manley transmission system is handled exclusively by the Hydraulic Truck Sales Co., 1777 Broadway, New York. The Mead engine is made by the Mead Engine Co., Dayton, O.

Adjutements on E-M-F

How Carbureter Is Adjusted, What to Do When Differential Sings, and Lack of Advance

INDIANAPOLIS, Ind.—Editor Motor Age—Will Motor Age inform me how to adjust the carbureter on 1910 E-M-F 30.

2—Cannot the singing in the differential be stopped? I have it well lubricated.

3—Is the timing on my car correct? I can advance the magneto either one-fourth or all the way and not change the speed of the motor in the least. Is this proper?—E. E. I.

1—There is but one adjustment on the E-M-F carbureter, as shown in Fig. 1. This is the screw, S, on the lock nut N. This screw controls the air valve. To turn it to the right increases the tension on the springs O and I, so that at the same speed, valve V will not open so wide, giving a richer mixture.

2—If your differential sings when well lubricated, it must be either out of adjustment or there must be a defective gear or pinion. Whether the trouble is in the differential proper or merely in the driving gears may be determined by noting whether the noise occurs only in rounding corners, or at all times. If it is in the differential proper, look for a defective pinion, while if it is in the driving gears, try adjusting the drive-pinion, by means of the nut at the front of the axle housing. If this fails, remove the cover and look for a broken tooth or chewed gears.

3—In a correctly timed car, all other elements being in proper order, each degree of advance will have its effect upon the speed of the motor. If advancing the spark lever beyond one-fourth of its sweep makes no impression on the motor, the chances are strong that its action is limited to that extent, probably by a loose connection. Run over all connections and see that there is no excess of lost motion. A good way is to have someone manipulate the spark lever, observing the effect upon the distributor. Your platinum points may not be breaking properly, breaking the circuit too soon or too late. They should break 3-64 inch.

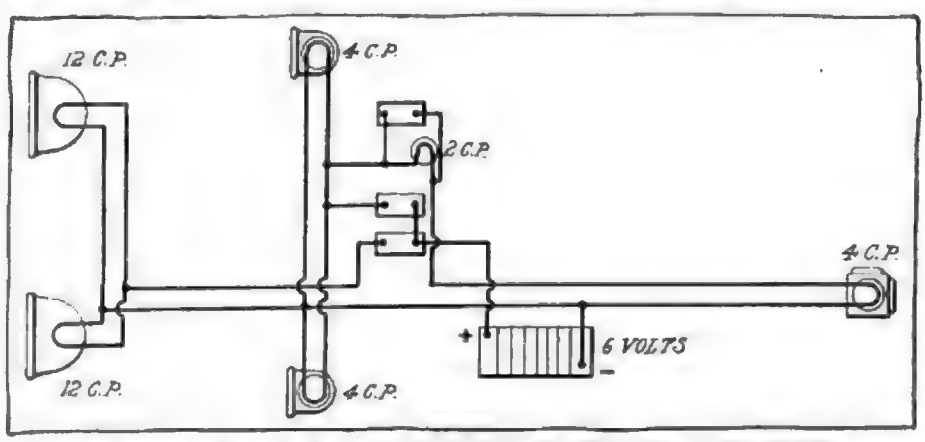


FIG. 7—THE BEST PLAN, WHICH IS SAFEST, BUT ILLEGAL IN ILLINOIS

planes which are 2¼ inches apart, the shortest distance between them being a horizontal line. When under load the bars work up or down depending on their temporary location as referred to the road surface. Under load the horizontal distance between the bar ends is less since any inclined line is greater than the perpendicular distance between the vertical planes and these bar ends. It therefore is evident that any motion of the ends of the bars means a horizontal pull on the flat springs and their consequent bending in.

Not Floating Hub

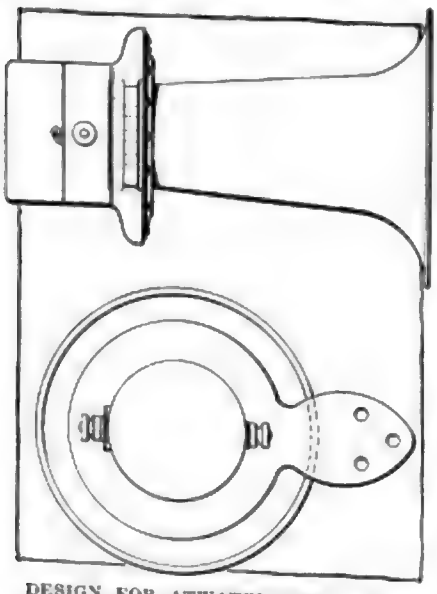
When there is a starting torque load imposed upon the wheel, there is a tendency for the inner portion to revolve within the outer part. But since the flat springs SB are mounted alternately on the two portions of the complete wheel, when the inner part received a twisting load, one bar pulls in one direction while the next one pulls in the opposite direction. This each two pairs of interconnected springs pull against one another equally nullifying the action and causing the outer and inner sections to move together with only a slight give.

The flat springs SB always are under tension, being drawn inward when assembled, the bars NN holding each set of springs closer together than they would be normally.

DENVER SENDS OUT ROAD SCOUTS

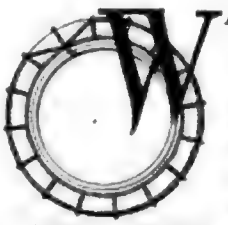
Denver, Colo., Oct. 26—A trip to mark out the Denver-Salt Lake City section of the projected Midland transcontinental route was started this week by Charles M. Kittredge, Jr., assistant secretary of the chamber of commerce, and A. L. Westgard, of the American Automobile Association.

The line of this proposed route passes through Golden, Idaho Springs, Kremmling, Berthoud Pass, Sulphur Springs, Wolcott, Glenwood Springs, Rifle and Grand Junction, Colo., and Green River, Cisco and Provo, Utah.



DESIGN FOR ATWATER-KENT HORN

Current Motor Patents



STEWART CHAIN

WALKING TRACTOR—No. 1,041,837—To Ambrose Miks, Ganado, Texas. Filed August 28, 1911, dated October 22, 1912. Walking is mechanically the securing of tractive motion by means of a temporary frictional anchoring of the tractive element, and the rocking of the weight to be carried on an arc of limited extent, with this anchored portion as a center, raising and moving the anchored portion ahead when in motion. It is a superior method of traction to the wheel, in that the frictional contact with the road is a flat surface instead of a theoretical line, as with the wheel. On this principle, the Miks tractor utilizes a set of four vertical legs, carrying pivoted feet as road contacts. These legs at about their center are provided with a circular aperture in which an eccentric is revolved, which porduces an oscillating motion from front to back and upward and forward in a compound reciprocating motion. The upper portions of the arms are slotted, and within them a revolving crank slides, producing longitudinal oscillation.

The action of each leg is a simultaneous lowering and backward movement, followed by an upward and forward movement; the first, bringing the weight of the vehicle on the foot, and moving it forward, and the second raising it clear of the road, and carrying it forward again. The four legs move intermittently, so that the motion is one of continuous propulsion. It is steered by the usual front wheels.

Two-Cycle Counter-bored Motor—No. 1,042,181—To Richard Trotter White, Richmond, Va. Filed February 17, 1912, dated October 22, 1912. A three-port two-cycle type, this motor is of the double-bore type, the cylinder being provided with bores of two diameters, and having a piston of two diameters. It differs from the usual construction of this type, in that the larger and lower bore, which constitutes the pump chamber, is provided with stationary walls inside and outside, in which an annular extension of the piston reciprocates. The inner wall of this pump-chamber is disposed within an annular slot in the piston body, and serves as an additional piston guide, compression being retained through it by a piston ring in the inner overlapping portion of the piston, which bears on its inner surface.

The upper portion of the pump chamber is open to the atmosphere at its upper end. The lower end is provided with slots about its entire circumference which communicate with an annular passage. This passage opens into the inlet port of the engine, tapering down from thence to the carbureter intake. As usual, the inlet port is situated at the bottom of the piston stroke in the combustion cylinder, and is opposed by the exhaust port. The advantage of this construction is that the intake of the charge is on the up stroke of the piston, and the compression on the down stroke, making the action of the engine similar to that of the four-cycle type, in this respect.

Tire Chain—No. 1,042,166—To John G. Stewart, Vandergrift, Pa. Filed June 24, 1912, dated October 22, 1912. This chain differs from the usual construction in that four circumferential chains are used, two at the bead and two at the tread. These chains are connected by diagonal and cross chains.

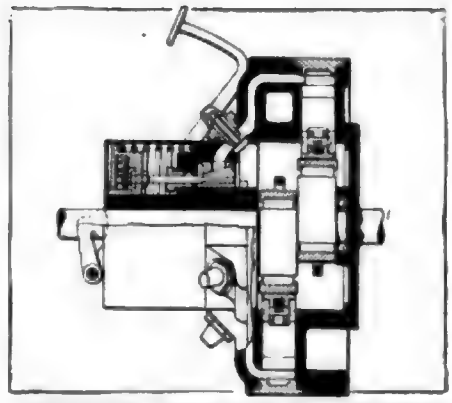
Hydraulic Transmission—No. 1,041,132—To Charles David McClintock, Oakland, Calif., assignor of 58-100 to Saul Cornfield, Oakland, Calif. Filed January 15, 1912, dated October 15, 1912. To provide a transmission means, presumably for motor cars, between a power source and a driving means, this invention consists of a housing containing a central fluid space, fluid cylinders, and an outer fluid space, with valves therefor, which is secured to the driving shaft, within which is disposed a driven shaft which carries pistons within the cylinders. These pistons are actuated in the cylinder by fluid pressure, their action being transmitted to the driven shaft by a cam- and pull-ring mechanism. The fluid is admitted to the cylinder by automatic check-valves. The rotation of the cylinders about the driven shaft causes the reciprocation of the cylinders. In so reciprocating, they pump the fluid from the central portion to the outer portion, whence it finds its way back to the central portion, through a spring retained pressure valve. With no load, this valve is held closed by the spring, so that no fluid is pumped, the pistons remaining stationary in the cylinders, and hence turning the driven shaft with them, at substantially driving-shaft speed. Upon a load being applied, however, the pressure of the fluid is increased, which causes the valve to overcome the resistance of the spring, and open. Its opening is proportionate to the pressure of the fluid, and hence to the load, thus allowing a proportionate leakage of fluid. The greater the leakage, the less the pressure, so that at the severest loads, the valve is so far open, permitting such a volume of leakage from the outer fluid space to the inner

Inventions of the Week

that the pistons have a considerable amount of action, and the driven shaft is hence rotated at decreased speed in proportion to the speed of the driving-shaft. To bring this condition about when the load is not so severe, a pedal is fitted which upon being pressed, causes a cam to bear upon the pressure spring, relieving its pressure, and permitting abnormal leakage. This gives low speed, and the extreme stroke of the pedal relieves the spring pressure totally, unseating the valve, and relieving the pressure entirely, so that the casing revolves about the driven shaft, and the pistons have full action, without transmitting any motion to the driven shaft. No reversing means is specified.

Lubricating System—No. 1,041,735—To Alanson P. Brush, Flint, Mich. Filed February 15, 1911, dated October 22, 1912. This patent relates to a system of splash lubrication, wherein circulation is automatically maintained in the engine base, without the use of mechanical appliances. This system is applied to multi-cylinder motor car engines, having an inclosed crankcase and a crankshaft. The crankcase is provided with oil splash pans, in which the connecting rods splash oil to lubricate the cylinders and wrist pins. The crank bearings are lubricated by means of tubes which scoop the oil from the troughs, and conduct it to the bearings. The main journals are lubricated by troughs, which catch a portion of the oil as it runs down the inside of the crankcase. The rest of this return flow is directed to the next trough ahead of the one from which it was splashed by sloping channels. Return leads conduct the overflow from the front trough to the rear.

Vacuum Tire—No. 1,042,065—To Willard Jay Woodcock, Brooklyn, N. Y. Filed January 3, 1912, dated October 22, 1912. This tire relies on air pressure for its source of resiliency, but, unlike the pneumatic type, the pressure is that of the atmosphere, outside the tire, the flexible tube, which forms the tire, inclosing a vacuum. This vacuum chamber is in the form of a narrow and deep annular slot, completely inclosed, to exclude the entrance of air. The side walls and tread are heavy, and prevented from coming together on their inner surfaces by spaced members, secured thereto. The deformation of the tire in passing over obstructions is resisted by the external pressure of the atmosphere, when the side walls of the tire are spread, enlarging the vacuum space.



McCLINTOCK HYDRAULIC TRANSMISSION

Nantucket Rowing Over Motor Cars

NANTUCKET, Mass., Oct. 19—The row over the use of a motor fire engine on the island of Nantucket, off the Massachusetts coast, which would furnish a basis for a comic opera plot, has at last reached the courts through August L. B. Fisher, a liveryman, bringing suit against the town of Nantucket, asking that an injunction be issued restraining the board of fire wardens from enlarging the fire engine house on Quince street.

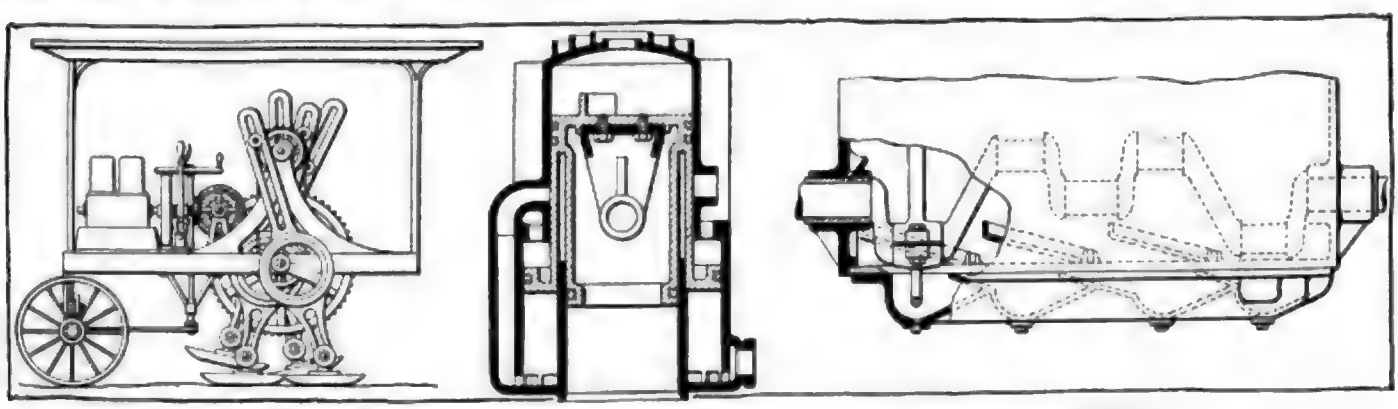
This suit is the outcome of antagonism against the presence of the new $6,000 motor fire engine on the island, which is protected from invasion by motor cars by a specially enacted law. Fisher alleges that the board of fire wardens is to infringe on his rights by the enlargement of the chemical house, taking therefor land which has been in public use for a quarter of a century. Mr. Fisher's stable is at the rear of the engine house and he has a right of way over the town's land.

The action of the fire wardens, he claims, is in direct defiance of the vote of the town, which a few weeks ago refused to appropriate money either for enlarging the building or men to operate the motor chemical, and now the liverymen are desirous that the apparatus be sold.

Fisher's suit is the first legal step taken to bring the matter to a head, however, service having been made on Henry Riddell, chairman of the board of selectmen; George Howard Winslow, town treasurer; Arthur A. Norcross and Maurice W. Boyer, fire wardens, and Harrison G. Gardner, superintendent of the fire alarm service. The notice of a temporary injunction against the town was issued in Boston by Judge Pierce, and he has set a date for the hearing, the writ being returnable the first Monday in December.

That the motor chemical is a white elephant is admitted now by those who have had anything to do with it, for to operate it on the island would place those who handled it amenable before the courts for violating the state law. The liverymen believe that to let it be used would be an opening wedge for the use of other motor vehicles on the island, and that would put them out of business. So it is believed now that if a reasonable offer were made for the machine it would be disposed of.

Summer residents, however, would like to see it put into commission, for they realize that it would be a much more efficient safeguard than the antiquated fire apparatus now in use, and their property interests on the island are very large. So everyone is awaiting with interest the action of Judge Pierce when the case comes before him in Boston.



MIKS TRACTOR, WHITE TWO-CYCLE MOTOR AND BRUSH LUBRICATION SYSTEM

between explosions, and they are called four-cycle engines.

The names of the five events that compose the cycle tell their nature. When the mixture is fired and the explosion occurs it is called ignition or explosion, when the gases expand and force the piston down it is called expansion or the power stroke, when the burned gas is driven out it is called the exhaust, and when the fresh inflammable charge is taken into the cylinder it is called admission, inlet or suction. The last event is when the charge is compressed into the head of the cylinder ready for the next spark, and that is called compression.

In a four-cycle engine the five events are accomplished in the following way: starting with the ignition of the compressed charge of inflammable gasoline and air mixture with the piston at the top of its stroke, the piston is forced down on the power or expansion stroke by the expansion of the burning gas. When it gets down to the bottom the piston starts back on the exhaust stroke, driving the burned, dead gas out of the cylinder. Upon arrival at the top of its stroke, it starts down again, sucking into the cylinder a charge of fresh gas—this is the inlet suction, or admission stroke; on the last upward stroke two things occur, first the piston squeezes the charge up into a small space in the top of the cylinder; this is called the compression stroke; just as the piston reaches the top of the cylinder on its compression stroke, a spark occurs in the spark plug which is sticking into the compressed gas and the latter is exploded, completing the cycle. The two down strokes are the power and inlet strokes respectively and the two upstrokes are the exhaust and compression strokes respectively.

So far, nothing has been said about how the fresh air gets into the cylinder or how the burned gas, usually called the exhaust gas or simply exhaust, gets out. This is done through two gates in the cylinder, called valves, one that lets the fresh gas in and the other that lets the fresh gas out. The first is called the inlet valve and the other the exhaust valve. These gates or valves must be opened and closed at just the right moments or the gas cannot be let in and out and compressed when necessary.

When the gas is exploded, both valves must be closed so that the force of the explosion shall not expend itself on the outside air but shall all go to sending the piston downward. Then on the exhaust stroke, the exhaust valve must open so that the exhaust gas will pass out of the cylinder; on the inlet or suction stroke the exhaust valve is closed and the inlet valve open so that the piston actually sucks the fresh mixture into the cylinder; while compression is going on, both valves are closed, otherwise the gas would be forced out of them. How these gates of the motor, the valves; are made and worked will be explained in the next issue.

Many Concerns to Exhibit in Chicago Commercial Show

Space Already Assigned to Sixty-Five Truck Concerns

NEW YORK, Oct. 28—Sixty-five commercial motor vehicle manufacturing companies secured exhibition space at the Chicago show in the October drawing. Allotments made at the drawing took all of the ground floor space in the Coliseum, Coliseum annex and the First Regiment Armory with the exception of five of the least desirable spaces comprising about 2,500 square feet in all. Three of these spaces have since been taken and there are in addition half a dozen applicants on the waiting list.

This indicates plainly that next February's exhibition will be considerably larger than last winter's, and in all probability it will be necessary to utilize the basement under the annex for the first time at the truck show. Between now and the opening of the show there are sure to be a score of belated applications which can be taken care of in no other way.

Last winter the show opened with eighty-two exhibitors of complete vehicles and chassis, but at the October drawing the allotments were smaller and only three or four companies went into the armory, which, however, filled up later.

There will be no motorcycle section this winter and the center of the second floor of the annex occupied by it last winter will be filled with motor car parts and accessories, so that this part of the show will be more comprehensive than heretofore. Most of the members of the Motor and Accessories Manufacturers will continue their displays from the first to the second week, and there will be many sundries displayed by unaffiliated concerns.

In the accompanying list of complete vehicle makers already allotted space are those that are new exhibitors in Chicago. These are the Brown Commercial Car Co., Buffalo Electric Vehicle Co., Four-Wheel Drive Auto Co., Gramm-Bernstein Co., Krebs Commercial Car Co., Lippard-Stewart Motor Car Co., D. F. Poyer & Co., Standard Motor Truck Co., Transit Motor Truck Co. and Universal Motor Truck Co.

Of these, only the Lippard-Stewart and Universal showed in New York last winter. The Brown company is the new concern organized by Will H. Brown, formerly of the Mais truck, which was exhibited in the Chicago show in 1910. The Gramm-Bernstein is the new enterprise of B. A. Gramm, whose Gramm Motor Truck Co. was sold to the Willys-Overland Co.

The half dozen makers now on the waiting list are: Mogul Motor Truck Co., Chicago; Mercury Mfg. Co., Chicago; H. J. Koehler S. G. Co., New York; Ideal Auto Co., Ft. Wayne, Ind.; Kentucky Wagon Mfg. Co., Louisville, Ky.; Ware Motor Vehicle Co., St. Paul, Minn. Of these, the Mogul and Mercury were exhibited before at Chicago, and the Koehler was shown at the Palace show in New York last winter.

It will be noticeable next February that the large companies have extended their lines and are offering a wider range of capacities than formerly and in some cases added electric vehicles to their gas truck lines or gas trucks to their electric lines.

The armory takes on an added importance this winter as a result of luck in the drawing, whereby several of the most prominent manufacturers got allotments in that building. Notable among these are the Packard, White, General Vehicle, Baker and Alden Sampson companies. The list of exhibitors now stands:

COLISEUM

Adams Brothers Co., Findlay, O.
American Locomotive Co., New York.
Autocar Company, Ardmore, Pa.
Buffalo Elec. Veh. Co., Buffalo, N. Y.
Buick Motor Co., Flint, Mich.
Clark Delivery Car Co., Grand Crossing, Ill.
Dayton Auto Truck Co., Dayton, O.
Federal Motor Truck Co., Detroit, Mich.
Flint Motor Wagon Dept. Durant Dort Carriage Co., Flint, Mich.
Garford Co., Elyria, O.
General Motors Truck Co., Pontiac, Mich.
Gramm Motor Truck Co., Lima, O.
Hupp Motor Car Co., Detroit, Mich.
International Motor Co., New York.
Thomas B. Jeffery Co., Kenosha, Wis.
Kelly Motor Truck Co., Springfield, O.
Kissel Motor Car Co., Hartford, Wis.
Knox Automobile Co., Springfield, Mass.
Krebs Com. Car Co., Clyde, O.
Locomobile Co. of America, Bridgeport, Conn.
W. H. McIntyre Co., Auburn, Ind.
Old Reliable Motor Truck Co., formerly Henry Lee Power Co., Chicago.
Peerless Motor Car Co., Cleveland, O.
Pierce-Arrow Motor Car Co., Buffalo, N. Y.
Pope Mfg. Co., Hartford, Conn.
Reliance Motor T. Co., Owosso, Mich.
Reo Motor Car Co., Lansing, Mich.
Selden Motor Vehicle Co., Rochester, N. Y.
Speedwell Motor Car Co., Dayton, O.
Sternberg Mfg. Co., Milwaukee, Wis.
Studebaker Corporation, Detroit, Mich.
United States M. Truck, Cincinnati, O.
Velie Motor Vehicle Co., Moline, Ill.
Walker Vehicle Co., Chicago.
Waverley Co., Indianapolis, Ind.

COLISEUM ANNEX

Bowling Green Motor Car Co., Bowling Green, O.
Chase Motor Truck Co., Syracuse, N. Y.
Dart Mfg. Co., Waterloo, Ia.
Lippard-Stewart Motor Car Co., Buffalo, N. Y.
M. & P. Elec. Veh. Co., Detroit, Mich.
Service Motor Car Co., Wabash, Ind.
Standard Motor Truck Co., Detroit, Mich.
Transit Motor Truck Co., Inc., Louisville, Ky.
Universal Motor Truck Co., Detroit, Mich.

FIRST REGIMENT ARMORY

Avery Co., Peoria, Ill.
Baker Motor Vehicle Co., Cleveland, O.
Bessemer Motor Truck Co., Grove City, Pa.
Brown Commercial Car Co., Peru, Ind.
Chicago Pneumatic Tool Co., Chicago.
Commerce Motor Car Co., Detroit, Mich.
Four-Wheel Drive Auto. Co., Clintonville, Wis.
General Vehicle Co., L. I. City, N. Y.
Gramm-Bernstein Co., Lima, O.
Harwood-Barley Mfg. Co., Marion, Ind.
International Harvester Co., Chicago.
Lauth-Juergens Motor Car Co., Fremont, O.
National Motor Truck Co., Bay City, Mich.
Packard Motor Car Co., Detroit, Mich.
D. F. Power & Co., Menominee, Mich.
Alden Sampson Mfg. Co., Detroit, Mich.
Sanford Motor Truck Co., Syracuse, N. Y.
A. O. Smith Co., Milwaukee, Wis.
White Co., Cleveland, O.

The Motor Car Repair Shop

Hints for the Amateur

Testing the Mixture

IT has been recommended that the proper adjustment of a carbureter can be obtained with great facility and precision by mounting upon the inlet manifold of the motor, a device constructed as shown in Fig. 1. It consists of a piece of ¼-inch tubing tapped into the inlet manifold of the motor as illustrated, a reduced combination coupling and valve connecting one end of this tubing to a piece of ½-inch tubing about ½ inch long; the latter being packed first with a little gauze, of cotton wool or wire, then with as many small brass capillary tubes as can be fitted into the ½-inch tube above the gauze.

With this device one has but to start the motor, open the valve, and apply a flame to the exposed end of the ½-inch tube. The gas that issues therefrom will ignite and burn with a colored flame, which, if blue in color, with little light green flame points issuing from each of the little capillary tubes, indicates that the mixture is correct; but if the flame is red or yellowish in color, the mixture is too rich, and the carbureter should be adjusted until the blue flame is obtained. If, in the process of adjusting, one finds that the flame becomes yellower as the adjustment is made in a certain direction, then adjust in the opposite direction until the desired blue flame is obtained. The yellow or lighter flame may be seen when the mixture is too strong, that is, when it contains too much gasoline. Therefore, if an improvement is not obtained in the color of the flame when the mixture is enriched, weaken the mixture by adjusting in the opposite direction. Generally, if the mixture is too weak, the flame at the top of the device will puff up and go out. This is often accompanied by a coughing and popping in the carbureter.

This recommendation was obtained from an engineer who has specialized in the design, construction and installation of acetylene gas lighting outfits, and he claims that he is now using devices of this kind on his motor cars with excellent results.

Adjusting a Carbureter

Adjusting a carbureter consists in regulating the proportion of air and fuel in the gaseous mixture so the mixture may be consumed to the best advantage in the motor. As for the ways and means of doing this, all depends upon the construction of the carbureter, and the facilities for adjustment. Before adjusting a carbureter, one always should endeavor to learn how to perform the operation by consulting either the manufacturer of the carbureter or motor, or some user that has successfully done the trick; for a trick it is, in many cases.

There are so many different designs and constructions now in use that no rules can be given that will enable one to successfully adjust all types; however, certain simple rules may be given which will apply to many designs. For instance, an experienced motorist or mechanic would begin by assuring himself that there is gasoline in the supply tank, then in the float chamber of the carbureter; the latter usually is done by depressing the float, or in some other convenient way, opening the valve governing the supply to the float chamber so that fuel will overflow from the carbureter.

Most carbureters have spray nozzles, so, if possible, an effort would be made to see if the fuel was passing through it or them when the float chamber was flooded. He would then try to start the motor by cranking it over a few times, noting at the same time whether or not there was reasonable compression in the cylinders. It is quite difficult to adjust a carbureter when the compression is not equally good in all cylinders; for poor compression in one or more cylinders will cause weak explosions, or misfiring, in those cylinders.

As the speed and power of the motor is generally determined by the sound and rhythm of the explosions, it is necessary that there should be no misfiring or loss of power from poor compression, faulty ignition, or air-leaks around the valve or inlet-manifold connections. This, of course, does not apply to factory carbureter adjustors when equipped with dynamometers, instruments which indicate the speed and power developed by a motor.

Before any adjustment on a carbureter is changed, one should decide if such a step is necessary. There is a sort of standard group of troubles, directly and indirectly connected with the carbureter, that should be known before the adjustment of a carbureter is attempted. For example, a rich mixture—in which the proportion of gasoline or fuel abnormally exceeds the amount of air—may be due to faulty adjustment of the float or air-valve, clogged air inlet pipe, dust on the inlet pipe screen, leaky float valve, or to a so called water-logged float, a term given to soggy cork or punctured metallic floats. A poor mixture, on the other hand, may be due to faulty adjustment of the air or float valve, a leak in the inlet manifold or around the pipe or valve connections; the fuel-supply cock may be partly clogged, or there may be water in the gasoline. If a motor cannot be started, the spray-nozzle, float-valve, or feed-pipe may be clogged, the gasoline tank empty, the supply-cock shut off, or the air pressure in the tank too weak.

In addition to these troubles, there are many more that pertain only to certain types and makes of carbureters. These are very important, and it is because of them that one should always try to consult a reliable source of information before attempting to adjust a carbureter whose peculiarities are not understood.

Overloading a Common Error

It is a most common error of the new motorist to overload his car either with passengers or luggage to such an extent that during the first few months, or year, of its use the car is subjected to unusually severe strains. The result is that the tires do not stand up as recommended; the car shows neither the power nor speed of the company's demonstration car; springs seem to flatten out or break before the year's guarantee has run out; brakes do not work with the necessary efficiency; and the general wear and tear on the entire chassis mechanism makes the repair bill at the end of the year seem unreasonably large.

Of course, it is difficult at times to prevent overloading a car; but under such circumstances, the operator should drive more slowly, take the bumps more easily, and bear in mind that the increased weight is going to make the brakes more difficult to operate with the same efficiency as with a normal load. Manufacturers of motor cars have been very generous in building their cars with a liberal capacity for overload; and the motorist should endeavor to cooperate with him in his efforts to prevent the abuse of the car in this manner. The manufacturer is just as anxious to have his product give good service as the owner; for he knows that a better advertisement can hardly be found.

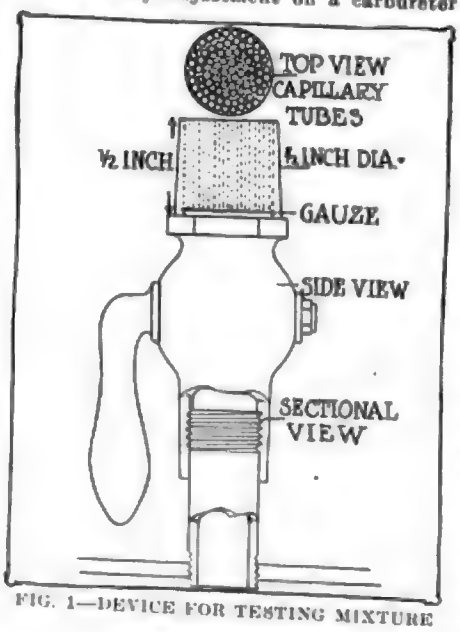


FIG. 1—DEVICE FOR TESTING MIXTURE

The Motorists' Bookman

Compounding of Rubber

INTENDED for use in factories and by practical rubber workers and chemists, "Crude Rubber and Compounding Ingredients," by Henry C. Pierson, makes its appearance in a second, renewed and revised edition. Mr. Pearson is editor of the India Rubber World, and a recognized authority, the publishers of that journal being also the publishers of this work. The volume combines the features of a general treatise on the rubber industry and rubber processes, with a classified lexicon of terms that constitutes a compendium of rubber information. As a reference work, it is of great value.

The book contains 298 pages of matter, and is completely indexed. It is unillustrated, and published by the India Rubber Publishing Co., New York.

Good Roads Year Book

The "Official Good Roads Year Book" of the United States for 1912 contains a fund of valuable information on this intensely live topic. Among its contents is to be found a list of the officers and members of the American Association for Highway Improvement, together with the constitution and by-laws of this organization; road legislation in the United States, showing from what sources funds are obtained, and how disbursed; under whose supervision work upon our highways is carried on; the suggested state aid bill printed in full, with an analysis of the same; bond issues, appropriations and mileage in the various states; the acting highway officials, their addresses and duties; a chapter on experiments with convict labor; an extensive list of patents issued in 1911 pertaining to roads; a list of general treatises on road and bridge construction and a great number of bulletins, circulars and documents published by the office of public roads. The associations of the United States, with their officers, that are members of the International Association of Road Congresses, also a list of manufacturers of road machinery and materials, and of road contractors, are contained in this compendium of highway information. A brief history of road building and short sketches of the various types of roads, their maintenance and repair, are to be found within its covers. The information compiled therein is brought down to December 31, 1911. Published by the American Association for Highway Improvement, Washington, D. C. Price, $1.

Roads, Paths and Bridges

Few subjects before the American people at the present time are of more importance or so far reaching as that of good roads. A disseminator of practical, authoritative information on the subject, comprehensive so far as its limited space permits, is the small volume, "Roads, Paths and Bridges," by Logan Waller Page, director of the United States office of public roads.

An interesting chapter on the history of roads leads the reader on, as a good road will, to investigate further. Highway legislation is next taken up, wherein is brought out the fact that the best results in a comprehensive system of roads are to be obtained under centralization of authority and responsibility. Another point which the author makes is the necessity for expert knowledge of highway engineering on the part of those undertaking the work.

Specific, practical information is given in the chapter on location and specifications, while the different kinds of roads—earth, sand-clay, broken stone and macadam—are discussed separately. The author's distinction between maintenance and repair is especially good, as he says, "To maintain a road means to keep it always in good condition, while to repair a road means to make it good only occasionally," and follows with methods for the maintenance of various kinds of roads.

The roadside, paths and bridges, and the new problems brought into the science of highway construction by the motor car, are discussed. Appended is a list of authoritative works on roads and road building. The book is meaty for whosoever is interested in the subject. Published by Sturgis & Walton Co., New York, N. Y.

A New Motoring Country

The ancient discoverer's averred right to preemption has in a mild and modified form descended to the motorist who feels a particular proprietorship in stretches of good roads wherever found. One of the latest discoveries in touring ground is the countries on the southern shores of the Mediterranean. When the French acquired possession in northern Africa and projected their boulevards along the lines of the ancient Roman military roads, even into the desert, they did not wittingly pave the way for the motor car. In "About Algeria," C. Thomas-Stanford writes, "Algeria, a land of great distances and admirable roads, is especially suited to the use of the motor car. And it is a country brimful of interest, historical and actual." He then proceeds to tell much of the special charms and matters of interest to be found there, pictorial, historical, psycological, etc. Selecting the cities of Algiers, Tlemcen, Constantine, Biskra and Timgad as bases from which to make radiating journeys, many delightful motor trips are suggested. From Algiers, facing the sea, through Constantine, the wonderful city of precipices, to El Kantara, the scenic gateway to the desert, under the guidance of Thomas-Stanford one's interest cannot flag. Witness to his keen appreciation of the treasures of this land, through the whole book runs a plea for the preservation of the beautiful and historic, and a retention of local character. Besides an excellent road map, the book is admirably illustrated. Of exceptional note are the beautiful doorways pictured, each a page of history in itself, a theme for the imagination, for, if the doorway be thus beautiful, what of the mind that conceived it which dwells within? Published by John Lane Co., London, England. Price, $1.50 net.

German Directory for Sportsmen

Braunbeck's Sport Lexicon for 1912-1913, in its usual size and form, has been brought to date by the inclusion of new autobiographies, such as that of Graf Zeppelin, Dr. Parseval and Prinz Heinrich von Preussen, also new articles and new addresses. It is printed in German. Published by Gustav Braunbeck, Berlin, Germany.

By the Father of Aviation

"Birdflight As the Basis of Aviation" is a translation of a work by Otto Lilienthal, by A. W. Isenthal, and published by Longmans, Green & Co., of New York. The book was first published in German more than 20 years ago, and still the exhaustive study, research and experiment that was finally concluded by his death in a motor glider, stands as authority today. As Euclid is to the science of mathematics, so is Lilienthal to the science of aeronautics—the fundamental authority. The results of his efforts are told in the translation of his own language in this volume, accompanied with many useful drawings and photo-gravures. The purpose of this translation is to stimulate afresh in English-speaking countries, experiment and research to the end of reproducing mechanically the flight of birds, rather than the pursuit of the glittering bubble of power-gliding, which is so responsive to swift development.

Rubber Hand Book

"Rubber Hand Stamps and the Manipulation of India Rubber," by T. O'Connor Sloane, is a complete and comprehensive treatise on all branches of india rubber manufacture, including its history, methods of production, its properties and peculiarities, and the myriad uses to which this material is applied. A very useful chapter on the manufacture and repair of rubber vehicle tires is included. The work concludes with much valuable information regarding miscellaneous rubber repairs. It is admirably adapted for use as a text or handbook for any branch of rubber manipulation. It contains 175 pages, comes bound in red cloth. The Norman W. Henley Publishing Co., of New York; $1.

Among the Makers

NEW Pullman Sales Manager—C. W. Jacoby has resigned the position of eastern sales manager of the Standard Electric Co., to assume the general sales management of the Pullman Motor Car Co., York, Pa.

Henderson Gets More Room—About 13,000 square feet of space has been leased in the Industrial building by the Henderson Motor Car Co. in Indianapolis and is being used as a paint shop, pending the completion of a large addition to the company's factory. The former paint shop is now a final assembly department.

Wilmot Again Chosen—The Minneapolis Automobile Trade Association has elected Walter R. Wilmot manager for the 1913 show in the Armory and annex and has executed a $5,000 contract for the decorations. The space for the show has been doubled by the erection of an addition to the Armory which adds 27,000 square feet of space. Accessories will be displayed in the gallery of the Armory, as before, and the vehicles will be shown on the ground floor of the two buildings.

Probably No Show in Washington—The chances for a motor car show in Washington, D. C., are slight. The chief obstacle is the lack of a building of sufficient capacity to house the exhibits of all those who wish to take part in any show. Convention hall, where the previous shows have been held, is the only available building, but there is some question about filling it with cars, many dealers believing it unsafe to use it for show purposes again. The show question will be discussed by the dealers at a meeting to be held in the near future.

Exhibit in Dairy Show—A number of enterprising dealers are making exhibits at the international dairy show, which is being given in the Auditorium from October 22 to October 31 inclusive. This is the second annual dairy show and it has been found an excellent medium for getting into touch with the agricultural classes. Among the exhibitors were: Petrol Motor Car Co., Milwaukee, Petrol; Hustis Brothers, King and Borland electric; Imperial Auto Sales Co., Imperial; Oakland-Wisconsin Motor Car Co., Oakland and Detroiter; Buick Motor Co., Buick trucks; Hickman-Lauson-Diener Co., Ford.

New Kissel Plant Nearly Ready—The Kissel Motor Car Co. of Hartford, Wis., expects to be able to take occupancy of its new branch plant at Milwaukee on or about November 15. The work of rearranging the new plant, formerly the Romadka trunk factory, is progressing rapidly, and some of the equipment is now being installed. Improvements to the main plant at Hartford, Wis., are being completed, the new buildings having been equipped and put into condition for continuous operation at full blast during the winter. The new Kisselkar service buildings at Chicago and St. Paul are nearing completion, and the new station at Boston has its formal opening this week.

THE Nashville Railway and Light Co. is one of the recent converts to the motor car, having just installed a G. M. C. electric tower wagon for emergency work and repair of its overhead trolley system, the truck displacing two horse-drawn emergency wagons in addition to effecting a substantial saving in operating expense. The electric tower wagon is capable of a speed of 18 miles an hour. It is stated that the street railway company intends replacing its entire fleet of horse-drawn vehicles with electric power wagons and that it plans to put two more electric power wagons into commission as trouble wagons in the very near future.

NASHVILLE'S NEW MOTOR TROUBLE WAGON

Dixon Company Changes—At the regular monthly meeting of the board of directors of the Joseph Dixon Crucible Co. following changes in the officers and board of directors were made on account of the death of Vice-president William H. Corbin: George E. Long, former treasurer, was elected vice-president to succeed Mr. Corbin; J. H. Schermerhorn, former assistant secretary and assistant treasurer, was elected to membership in the board of directors and made treasurer of the company.

Big Plant Expansion—The New Process Raw Hide Co., Syracuse, N. Y., has just erected additions which make its complete plant now the largest single plant in the world devoted exclusively to gear-making and gear-cutting, it is claimed. The latest additions are a four-story and basement wing extending 65 by 180 feet at right angles to the old building and a heating plant in the rear 60 by 50 feet, housing three 125-horsepower boilers. The new buildings are entirely fireproof throughout, having steel framework, reinforced concrete floors, concrete roofs, brick curtain walls and steel window sash. New equipment to the extent of $100,000 has been installed. The hardening and heat-treating department has been enlarged and six Gleason rotary oil furnaces installed, together with an oil refrigerating plant for cooling the oil. A laboratory also has been added for the testing and analysis of the various alloy steels and gear metals used.

Lavigne Chooses Racine—The Lavigne Gear Co. of Corliss, Wis., and Detroit, which moved its plant and equipment from Detroit to Corliss about a year ago, at which was reported to have been contemplating a return to the Michigan metropolis, has leased the big Racine plant of the Racine-Sattley Co. of Racine, Wis., and Springfield, Ill., and will occupy 50,000 to 75,000 feet. The Racine-Sattley company recently was reorganized and decided to concentrate its works at Springfield, Ill., abandoning the Racine works. The Lavigne Gear Co., which manufactures steering gears and other motor car parts, has been occupying a part of the mammoth works of the Wisconsin Engine Co. at Corliss. The quarters became much too small, and it was proposed to return to Detroit, especially as the Wisconsin Engine Co. came into the need of more room for expansion at once. The Lavigne company plans to greatly increase its working force and capacity without delay.

Hickman Re-elected President—Isaac N. Hickman, president of the Hickman Lauson-Diener Co., state agent for the Ford, was re-elected president of the Milwaukee Automobile Dealers' Association at the annual meeting held on October 23. Ed. Estberg was re-elected vice-president; George P. Hewitt was elected treasurer, succeeding August A. Jonas. A. E. Raffauf was re-elected secretary. The executive board consists of Messrs. Hickman, Estberg, Hewitt, Raffauf and Alter. March. Although the association would

Brief Business Announcements

Agencies Appointed by Pleasure Car and Truck Manufacturers

Town—	Agent	Car
Asheville, N. C.	Asheville Auto Co.	Alco
Boise, Ida.	Wade & Adellman	Federal
Boston, Mass.	Republic Motor Car Co.	Chevrolet
Boston, Mass.	Republic Motor Car Co.	Little
Buffalo, N. Y.	Barrett Motor Car Co.	Apperson
Butte, Mont.	Packard Motor Car Co.	Packard
Chattanooga, Tenn.	Auto Repair Co.	Alco
Columbus, O.	Oscar Lear Motor Car Co.	Oldsmobile
Columbus, O.	Oscar Lear Motor Car Co.	Oakland
Columbus, O.	Everett Auto Sales Co.	Flanders
Erie, Pa.	Star Garage Co.	Alco
Fond du Lac, Wis.	E. W. Clark Motor Co.	Jackson
Fond du Lac, Wis.	E. W. Clark Motor Co.	Premier
Grand Rapids, Mich.	E. A. Merrill	Alco
Grant's Pass, Ore.	Allen & Dunn	Federal
Greenville, S. C.	W. Conway Thompson	Federal
Harrington, Wash.	J. Thompson & Son	Chalmers
Independence, Ore.	Hanna Brothers	Federal
Kankakee, Ill.	Kankakee Motor Car Co.	Alco
Lowell, Mass.	Walter Perham	Cadillac
Louisville, Ky.	Peter M. Androit & Sons	Atterbury
Madison, Wis.	Hokanson Auto Co.	Chalmers
Memphis, Tenn.	Tri-State Chalmers Co.	Alco
Mendota, Ill.	George Wendel	Rambler
Milwaukee, Wis.	J. G. Wolleager Co.	Studebaker
Milwaukee, Wis.	Hustis Brothers	King
Milwaukee, Wis.	Hustis Brothers	Stevens-Duryea
Milwaukee, Wis.	Hustis Brothers	Borland
Montreal, Que.	Victor Octave Reed	Hupmobile
Morristown, N. J.	A. M. Guerin	Franklin
New Bedford, Mass.	O'Neil Auto Co.	Stearns
New Bedford, Mass.	O'Neil Auto Co.	Hudson
New Bedford, Mass.	O'Neil Auto Co.	Hupmobile
Portland, Ore.	Stoddard-Dayton Automobile Co.	Menominee
Poughkeepsie, N. Y.	R. B. Kelly	Federal
Quebec, Can.	J. A. Landry	Speedwell
Salem, Ore.	B. C. Boedinheimer	Federal
Scranton, Pa.	Simpson & Hubbard	Michigan
Seattle, Wash.	Olympic Motor Car Co.	Rauch & Lang
Seattle, Wash.	Van Brunt Motor Car Co.	Pathfinder
Seattle, Wash.	Pacific Car Co.	Federal
St. Paul, Minn.	Central Auto Co.	Premier
St. Paul, Minn.	Borg & Wharry	Stewart
Union, N. J.	Union Auto Co.	Federal

DETROIT, Mich.—The Stromberg Motor Devices Co. has opened a Detroit branch, with N. H. Minniter in charge.

Detroit, Mich.—The Wolverine Castings Co. of Detroit has been incorporated with a capital of $100,000 to manufacture motor castings.

Cleveland, O.—The Cadillac Automobile Co. has filed papers with the secretary of state changing its name to the Cleveland Cadillac Co.

Detroit, Mich.—J. W. Cully, formerly with the New York branch of the Swinehart Tire and Rubber Co., has been appointed local manager of the Detroit branch.

New York—W. Mason Turner has been engaged as manager of S. J. Wise & Co., Broadway and Fifty-eighth street, New York, agents for the Paige-Detroit and Touraine six.

Chicago—The G. Piel Co., of Long Island City, N. Y., has opened a Chicago branch at 1461 Michigan avenue, with R. G. Ames as manager. Territory extending from Cleveland to Denver, and Minneapolis to Texas, is to be covered from this branch.

Syracuse, N. Y.—M. H. Granger has bought from J. O. Brodeen the Buick agency for Onondaga county, of which Syracuse is the center, and a large part of Oneida county. James Bex, sales manager of the Buick garage, will remain in that capacity and the present quarters at 571 South Clinton street will be retained.

Sheboygan, Wis.—The Wald Mfg. Co., recently incorporated for $30,000, has increased its capacity and added a large number of workmen to its force. The company specializes in the manufacture of a tire tool, pedal grips, luggage carriers and mudguards. Considerable new equipment has been installed and a 4,000-pound stamping press and complete nickel-plating outfit purchased. The company formerly was known as the Wald Co.

Detroit, Mich.—Harry M. Snyder, of the former Snyder-Harbridge Sales Co., has been made secretary of the Reo Motor Car Co., of Lansing.

Detroit, Mich.—C. M. Clement has become production manager of the Metal Products Co., of Detroit, having resigned as factory manager of the Weston-Mott Co.

Lima, O.—A building permit has been issued for the construction of a garage on North Main street by J. A. Ireton, who will occupy it with a garage and repair shop.

Detroit, Mich.—The Rands Mfg. Co., maker of motor car equipment, has purchased from the Pfauder Realty Co., Rochester, N. Y., the plant located at Fort and St. Antoine streets. The plant is about two-thirds the size of the factory now occupied by the company, and will be operated as an addition to the present plant.

St. Louis, Mo.—The Kardell Motor Car Co., of St. Louis, has taken the agency for eastern Missouri and southern Illinois for the Little four and the Little six manufactured by the Little Motor Car Co., of Flint, Mich. This new arrangement will in no way affect the local agency which is controlled by the M. W. Bond Automobile Co.

Indianapolis, Ind.—Mrs. Laura B. Elder has acquired a site at the northeast corner of Vermont street and the Capitol avenue boulevard in Indianapolis, and has let a contract for a building to be occupied by motor car sales rooms. The building will be 95 by 135 feet, and the construction of white enamel brick, trimmed with green brick, the sides facing the streets to be of glass. The building will cost $20,000 and will contain four sales rooms.

Cleveland, O.—The Auto Owners Co., of Cleveland, has filed papers with the secretary of state changing its name to the Sixth City Tire Repair Co.

Columbus, O.—Papers have been filed with the secretary of state increasing the capital stock of the Knight Tire and Rubber Co., Canton, O., from $331,500 to $1,500,000.

Davenport, Ia.—Denial is made by the Davenport Auto Co. that it has made any changes in the management. It will continue to handle the Krit and operate a taxicab line.

Boston, Mass.—Volney J. Jacobs, who has represented various makes of cars in Boston for the past few years, has filed a petition in bankruptcy. His liabilities amount to $19,483, of which $13,572 is secured and there is due about eighty creditors $5,892, the principal one being Walter C. Allen, of New York. Jacobs' assets are given as $50.

New York—David C. Fenner has been appointed New York branch manager of the International Motor Co. Robert F. Fulton, former branch manager, has been promoted to the position of assistant to General Sales Manager W. S. Stevenson. At the same time C. W. Stratford, consulting engineer, becomes chief engineer, vice Edward R. Hewitt, resigned.

Phoenix, Ariz.—The Arizona Motor Co. Inc., has issued a statement denying it has been absorbed by the Transcontinental Motor Co. The story became current when F. A. Carr, who operated a garage here, which he called the Arizona Motor Co. bought the Transcontinental company, consolidating the two interests. The Arizona Motor Co., Inc., is the Studebaker

agent here and has no connection whatsoever with Mr. Carr, it is claimed by its president.

Columbus, O.—W. W. Muzzy is the new manager of the High-Seventh garage, located at High street and Seventh avenue.

Detroit, Mich.—Grosvenor A. House has been appointed sales representative of the Hayes Wheel Co., of Jackson, with an office in the Ford building.

Albany, N. Y.—The E. V. Stratton Co. has opened a repair and service building at 391 Hudson avenue just north of Washington park for the care of Everitt cars and Flanders sixes and electrics.

Milwaukee, Wis.—The Fisk Rubber Co. is building a new branch house and service station adjoining its present quarters at 456 Milwaukee street. The new building will be three stories high, 40 by 120 feet in size.

Cleveland, O.—The Winton Motor Car Co. announces the appointment of Charles D. Smith as production manager. Walter H. Doddridge succeeds Mr. Smith as manager of the company's repair and service departments.

Syracuse, N. Y.—The Overland-Syracuse Co., of which J. W. Lee is manager, is to handle Garford pleasure cars and trucks. T. F. Fitzpatrick, of the Overland-Syracuse garage, is to be the new manager of the truck department.

Boston, Mass.—W. S. Howes, for several years sales manager for the Dodge Motor Vehicle Co. in Boston, formerly agent for the Pope-Hartford line, has accepted a position with the new company that has just taken over the agency.

Columbus, O.—Judge Kinkead in the court of common pleas, has ordered the sale of the property of the Barndt & Johnson Automobile Supply Co., 2030 South High street. Fred W. Herbst has been receiver for the concern for several weeks.

Syracuse, N. Y.—The Jefferson Garage Co. will open its new garage in the Freeman block, 428-432 East Jefferson street, in a few days. Charles J. Roehm will manage the business and will handle the National, Hupmobile and Alco cars and the International truck.

Milwaukee, Wis.—E. B. Huylar has resigned as manager of the Milwaukee branch of the Diamond Rubber Co., 132 Oneida street, and is succeeded by R. W. Smith, who comes from Indianapolis. A. G. Langher is traveling representative in Wisconsin, with headquarters at the Milwaukee branch.

Savannah, Ga.—Jacob Bruno, mechanical engineer, of Hamilton, O., wants Savannah to bid in competition with other cities for a motor car factory. Bruno says that a company is rapidly being organized through his efforts to build cars. The company is searching for a location, preferably in the south, and he has turned to Savannah as the most available location. The suggestion of Bruno has been taken under consideration by the chamber of commerce.

Detroit, Mich.—George S. Waite has been engaged as sales manager of the W. A. Paterson Co., Flint, Mich., manufacturer of the Paterson line of cars.

Sheboygan, Wis.—William Loeffler, for many years foreman of the Jenkins Machine Co., Sheboygan, Wis., has resigned to engage in the garage and repair business at 826 St. Clair avenue.

Chicago—Officials of the Auto Mart of Chicago disclaim any connection whatsoever with the Auto Mart Cut Rate Tire and Supply House recently opened in Milwaukee and which was reported to be a branch of the Chicago concern.

Kansas City, Mo.—The National Motor Car Co. has moved from its temporary quarters at the Shackelford garage, Eleventh and Locust, to its new sales-rooms, 1708 Grand avenue. H. F. Sundin is the manager of this agency.

Kansas City, Mo.—Holcker & Elberg, carriage and body builders, who have recently accepted the agency of Peerless pleasure and commercial cars, are installing a motor car department in their building at Sixteenth and McGee streets.

York, Pa.—Charles E. Sweeney has become advertising manager for the Kline Motor Car Corporation, of York, Pa., and Richmond, Va., succeeding W. P. Sieg, who in the future will devote his entire time to the Kline sales organization.

Buffalo, N. Y.—H. E. Bradford has been appointed superintendent for the Stewart Motor Corporation, of Buffalo, manufacturer of light delivery trucks. Mr. Bradford formerly was connected with the Nordyke & Marmon Co. and prior to that with the National.

St. Louis, Mich.—The citizens of St. Louis have succeeded in raising $25,000 for a new motor car factory, to be conducted under the management of W. H. Kilto & Son, Toledo, O. Work on the factory will be started soon. The company will manufacture six-cylinder trucks and touring cars.

Milwaukee, Wis.—The G. H. Hafemeister Motor Co., of Watertown, Wis., has established a garage and service station at 322-324 East North avenue, Milwaukee, Wis. The company is state agent for the Staver and its principal place of business is at 203-207 Third street, Watertown. W. N. Wegemann, of Watertown, has been appointed manager at Milwaukee.

Anderson, Ind.—P. E. Kempton, of San Francisco, has been made manager of the San Francisco Remy branch, to succeed A. J. Rogers, who becomes manager of the New York branch to succeed F. M. Henkel, resigned. W. F. Hamilton, formerly assistant manager of the Indianapolis branch, becomes assistant manager of the San Francisco branch and is succeeded at Indianapolis by A. H. Berndt, who has been connected with the sales department of the Remy Electric Co., for several months.

Boston, Mass.—Harry S. Morrison, formerly a salesman for the Whitney-Barney Co., of Boston, has just been promoted to be general sales manager of the company.

Pontiac, Mich.—S. H. Humphrey, formerly connected with the Peerless Motor Car Co., has taken the position of factory manager of the Oakland Motor Car Co., to fill the vacancy occasioned by the accidental death of T. W. Wilson on September 15.

Indianapolis, Ind.—A position as special traveling representative, with territory in eastern Indiana, with the A and M Sales and Service Co., Indianapolis, has been taken by J. A. Newby, formerly manager of the United Motor Newcastle Co. at Newcastle, Ind.

Detroit, Mich.—The United Motors Detroit Co. has removed its headquarters temporarily from Woodward and Charlotte avenues to the Brush plant, where service will be provided owners of Maxwell, Columbia, Courier, Brush and Stoddard-Dayton cars.

St. Louis, Mo.—After a slight misunderstanding with another local company, it is announced that the Standard Electrique car is to be handled in St. Louis and its surrounding territory by the Cook Motor Vehicle Co. This company formerly sold the Columbus electric.

Willimantic, Conn.—The Chesboro estate at the corner of Main and Windham streets has been conveyed to Fred D. and William P. Jordan, and they acquire with it the garage business of the E. P. Chesboro Co. The new owners will make extensive improvements.

Kansas City, Mo.—H. J. Clark and J. H. Runcie have formed the Cole Motor Co. and have taken over the agency of Cole cars for Kansas City, western Missouri and eastern Kansas. They have leased a salesroom at 1712 Grand avenue. Frank Bruening, former distributor of Cole cars, has retired from the motor car industry.

Indianapolis, Ind.—The Goodyear Tire and Rubber Co. has begun the construction of a new business and warehouse building at Walnut street and Capitol avenue in Indianapolis. It will be 50 by 200 feet, of fireproof construction and will cost $107,000. The building is to be occupied by the company as an Indianapolis sales branch as an Indiana distributing branch.

Philadelphia, Pa.—A new company consisting of well-known business men and operating under the name of the Wallace Automobile Co. has taken over the local agency for the Pope-Hartford line of pleasure cars and motor trucks. Headquarters are at 332 North Broad street, in connection with which will be conducted a garage and service department located at 206-210 North Twenty-first street. The officers of the new company are William

M. Brownback, president; H. B. Pearson, vice president, and Robert Wallace, secretary and treasurer.

Toledo, O.—H. L. Croy, formerly mechanical engineer of the Woods Motor Vehicle Co., Chicago, has organized the Toledo Engineering Agency of Toledo, O.

Boston, Mass.—The Pope-Hartford Co. of Boston has just leased a large building on Heywood street, Cambridge, recently completed of steel and concrete, and will use it for a service station.

Haverhill, Mass.—George A. Burnham, James P. Molloy, Charles S. Goodwin and Frank P. Kimball have formed the Rambler Motor Car Co., to handle that make. The company is incorporated for $10,000.

Philadelphia, Pa.—A three-story brick and concrete garage, 74 by 86 feet, is in course of construction for the Pullman Taxicab Co. at 1542 Wood street. The building is to cost approximately $45,000.

Burlington, Wis.—The Raymond C. Agner Co., manufacturing adjustable socket wrenches, grease and oil guns and other specialties, is now located in its new factory, erected at a cost of $30,000. The output has been increased 75 per cent.

Detroit, Mich.—Thomas Walker and Superintendent Weiss of the Weston-Mott Co. and other associates have bought the Flint Axle Works and the firm name will be changed to the Walker-Weiss Axle Works. They will enlarge the facilities of the plant for the manufacture of axles.

Regina, Can.—The Regina Motor Co., has been reappointed representative of the Studebaker Corporation of Canada. Although 6,000 cars were sold in western Canada this year, the demand is not yet supplied, and the Regina Motor Co. has bound itself to sell almost three times the number of cars sold in any previous year. The cars contracted for by this concern are valued at almost half a million dollars.

Columbus, O.—Robert F. Boda & Co., 25 North Fourth street, has contracted to handle the Reo in fifteen counties in central Ohio for 1913.

Columbus, O.—The Eastern Auto Co., 58-62 East Spring street, which has been doing a garage and repair business for some time, announces that it will go out of business. F. F. Cain is general manager.

Columbus, O.—The J. C. Sherwood Rubber Co., which was incorporated recently to handle the United States line of tires in central Ohio, has organized by electing J. C. Sherwood, president and treasurer, and Robert C. Crippen, secretary and manager.

Minneapolis, Minn.—The Havers Motor Car Co., Port Huron, Mich., has closed a contract with A. F. Chase & Co., Minneapolis, Minn., who will handle the Havers line as distributors for a portion of Wisconsin, Minnesota, North Dakota, Montana and a portion of South Dakota.

Vancouver, B. C.—The large number of motor trucks and motor cars operated in Vancouver has induced the Kelly-Springfield Tire Co. of New York to open up a branch office in this city at 929 Pender street, W. Harry R. Sauer has been appointed manager of this branch.

Columbus, O.—Since the consolidation of the Diamond and Goodrich companies the two Columbus branches have been consolidated with the former Diamond branch at 186 East Gay street under the management of H. S. Smith. Part of the office force of the Goodrich branch, which was located at 512 East Long street, has been taken to the Diamond branch. The two lines will be handled separately in the same branch.

Philadelphia, Pa.—The Cartercar Motor Co., now at 632 North Broad street, will during December remove to its new building, 661-669 North Broad street.

Detroit, Mich.—The Ottawa Leather Co., of Grand Haven, Mich., is reported to have leased property in Detroit for the establishing here of a leather manufacturing business for the motor industry.

Philadelphia, Pa.—The Ford Motor Co. 250 North Broad street, has leased property at Sixteenth and Washington avenue and will establish an assembly plant on the site. This property will also give the Ford company the benefit of its own railroad siding. The North Broad street retail salesrooms of the company will after November 1 be located at 257-259 North Broad street.

Indianapolis, Ind.—A contract has been let by the Wabash Realty and Loan Co. for a two-story factory building at Standard avenue and Division street, in Indianapolis, to cost $20,000. The building will be 450 by 50 feet, and when completed will be used as an addition to its already large plant by the Motor Car Mfg. Co. The new building is to be of fire-proof construction.

Milwaukee, Wis.—Frank F. Tuschen, Watertown, Wis., has taken over the garage and business of the Boulevard Motor Co., 264-268 Twenty-seventh street, Milwaukee, and disposed of his business at Watertown to Felix Knospe, of Clyman, Wis., and August Knospe, of Hustisford, Wis., who will continue the garage and business. Mr. Tuschen is state distributor for the Nyberg line.

Recent Incorporations

Akron, O.—Akron Welding Co., capital stock, $10,000; to manufacture and deal in parts; incorporators, M. N. Smith, G. D. Stiver, E. H. Boylan, D. H. Morgan, L. H. Smith.

Albany, N. Y.—Albany Motor Racing Association, capital stock, $1,000; incorporators, J. D. Keeler, R. P. Keeler, S. H. Shaw.

Aurora, Ill.—National Cycle Accessory Co., to manufacture motor car accessories; incorporators, A. J. Jeffery, E. E. Ruth, A. G. Gustafson.

Boston, Mass.—New England Motorist Co., capital stock, $75,000; publishing business; incorporators, F. Hurtubis, Jr., T. T. Bouye, R. E. Croke, W. H. McMahon.

Boston, Mass.—N. E. Motorist Co., capital stock, $75,000, to publish motoring journal; incorporators, F. Hurtubis, Jr., T. T. Bourne, R. E. Croke.

Brookfield Garage Co., capital stock, $10,000; general motor car business; incorporators, R. S. Brownlee, F. Dick, A. Gannon, W. L. Yaney, R. W. Markham.

Buffalo, N. Y.—Lafayette Motor Sales Co., capital stock, $10,000; incorporators, J. A. Groh, F. J. Batt, A. E. Groh.

Camden, N. J.—Hendricks Mfg. Co., capital stock, $250,000; to deal in motor car accessories, incorporators, F. R. Hansell, J. A. MacPeak, F. S. German.

Chicago—S. Breastone, Inc., capital stock, $50,000, to manufacture motor vehicles; incorporators, R. Storch, W. H. Davenish, J. Warner.

Chicago—Auto Combination Lock Co., capital stock, $50,000; incorporators, H. L. Mason, H. M. Snow, F. W. Robinson, W. J. Liddy.

Chicago—Harry Taxicab Co., capital stock, $2,500; general motor car business; incorporators, A. A. Rolf, F. A. Tulford, M. Mears.

Chicago—Dean Auto Devices Co., capital stock, $10,000; incorporators, E. R. King, R. Lewis, G. F. Ort.

Cleveland, O.—Perrine Mfg. Co., capital stock, $10,000; to manufacture and deal in motor cars; incorporators, R. A. Wilbur, C. S. Wathner, H. H. Burton, B. A. Gage, A. S. Dole.

Daytona, Fla.—Pneu Tire Filler Co., capital stock, $2,500; incorporator, V. P. Collins.

Detroit, Mich.—Parker Motor Co., to manufacture rotary valve motors.

Detroit, Mich.—Tyro Mfg. Co., capital stock, $5,000, to manufacture and deal in motor vehicles; incorporators, R. I. Wellington, W. C. Stuart, F. J. B. Gerald.

Hartford, Conn.—Locomobile Co. of Missouri, capital stock, $10,000; incorporators, L. A. M. Marsh, D. S. Day, S. Stoddard.

Jacksonville, Fla.—Atkinson Tire & Supply Co., incorporators, R. L. Atkinson, J. D. Cary, L. H. Boggs.

Louisville, Ky.—Rothmel Motor Car Co., capital stock, $15,000.

Madison, N. J.—Michigan Motor Sales Co., capital stock, $10,000; to deal in motor vehicles, incorporators, E. L. Reynolds, A. L. Reynolds, C. Reynolds.

Menominee, Mich.—D. F. Poyer Co., capital stock, $75,000; to manufacture motor trucks.

Mount Vernon, N. Y.—Mount Vernon Local Auto Express Co., capital stock, $1,500; incorporators, L. Jacobson, F. Cardillo.

New Orleans, La.—Exeride Fuller Co., capital stock, $1,000,000; to manufacture filler for tires.

Newark, N. J.—Lippard Stewart Sales Co., capital stock, $50,000; to deal in motor cars; incorporators, B. P. Burton, R. C. Bennett.

Newark, N. J.—W. C. D. Motor Car Co. capital stock, $50,000; general motor car business; incorporators, P. C. Wells, W. E. Campbing, Wm. J. Drumpelmann.

New York—Cathedral Park Garage, Inc., capital stock, $1,000; incorporators, M. Klein, K. Klein, S. Klein.

Petrolia, Ont.—Petrolia Motor Car Co. capital stock, $300,000; directors, W. English, C. H. Metcalf, J. A. McKenzie and others.

Philadelphia, Pa.—McGraw Tire & Rubber Co., capital stock, $100,000.

Portland, Me.—Maine Power Truck Co. capital stock, $10,000; directors, L. L. Peabody, G. E. Peabody, H. E. Nixon.

Salem, Ore.—Beaver State Motor Co., capital stock, $300,000; to manufacture motor vehicles; incorporators, P. A. Combs, J. L. Bailey, G. A. Johnson.

Sheboygan, Wis.—Wald Mfg. Co., capital stock, $30,000; to manufacture tire repair tools.

Toledo, O.—Valley Light & Power Co., capital stock, $200,000.

Troy, N. Y.—Auto Salvage Corp., capital stock, $2,000; to deal in second-hand motor cars; incorporators, M. Kennedy, T. P. Lee, M. F. Nichols.

University City, Mo.—St. Louis Tire & Rubber Co., capital stock, $150,000; to manufacture rubber goods; incorporators, J. A. Swinehart, H. C. Baker, A. C. Einstein, W. H. Glasgowk, R. F. Britton, C. C. Collins, C. M. Skinner.

Washington, D. C.—Croton Motor Car Co. capital stock, $300,000; incorporators, J. F. Stoltz, A. M. Linn, J. D. Bigger, J. I. Brownson, J. H. Donnan, H. C. Warne, C. S. Caldwell.

Williamson, Me.—Goodyear Tire & Rubber Co. of South America, capital stock, $3,000,000; directors, E. M. Leavitt, J. Williamson.

Wilmington, Del.—Dayton Motor Truck Co. capital stock, $100,000; to manufacture and deal in motor vehicles; incorporators, E. F. McWhiney, N. P. Coffin, H. E. Latter.

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General Electric and Rushmore at Law

Clash of Patent Claims on Electric Lighting and Starting Devices

TRENTON, N. J., Nov. 4—Suit has been entered in the United States district court for the district of New Jersey by the General Electric Co. against the Rushmore Dynamo Works, charging infringements of the Barry and Steinmetz patents, Nos. 884,555 and 713,523, which are alleged to cover certain principles of winding and regulating electric dynamos involved in the electric lighting and starting systems used in the motor art.

The Rushmore company has proceeded on the principle that patent No. 1,016,037, granted to Samuel W. Rushmore, January 30, 1912, for an electric lighting system for motor cars does not infringe the rights of the complainant's patents.

The suit has been started, but the matter is not likely to come to an issue before the middle of January and may be heard before vacation in 1913, although this is by no means certain.

The Barry patent was granted April 14, 1908, to C. E. Barry, and is for a system of regulating dynamo electric machines. The chief element of the idea is its provision for limiting maximum voltage of the generator, irrespective of its speed or load. The device was primarily intended to cover generators driven from the axles of railway cars, but the principle is said to cover motor cars as well. In accomplishing the object the inventor resorts to two windings with a system of balances to control the voltage.

The Steinmetz patent was granted to C. P. Steinmetz for a compound-wound generator, November 11, 1902. It covers a method of compensating for the variation in voltage due to variation in permeability of the magnetic circuit. This is accomplished by automatic compensation; diverting current by a field coil; using parallel circuits; two magneto-motive forces; passing current through a field coil.

On behalf of the defense it is stated by Mr. Rushmore that the Rushmore patent, granted specifically for an electric lighting system on vehicles, does not infringe either of the other patents cited in suit. The dynamo is driven from the propelling axle or engine at widely differing rates of speed. In order to prevent the burning out of the lamps when the voltage is high, due to the high rate of speed of the propelling mechanism, or the destruction of the storage battery from overloading, some system of compensation is required. Rushmore's invention consists essentially of a ballast coil made of iron or other metal having a high positive resistance temperature coefficient when heated and so arranging the various parts that sudden rises in voltage and consequent rushes of current are opposed by the ballast coil, proportionately to the rises in voltage and the fluctuations are absorbed by the battery.

According to the statement of Mr. Rushmore, his patent was granted after a close scrutiny and familiarity with the prior art and the claims of his patent were drawn by Dr. Albert F. Ganz of Stevens and George Cooper Dean, electrical and patent law expert.

In commenting on the Barry and Steinmetz patents, Mr. Rushmore says that in the Barry device it is attempted to control the voltage of the dynamo irrespective of current output, with individual ballasts to protect each lamp. The Steinmetz patent seeks merely to compensate for variation in magnetic permeability of his dynamo when driven at constant speeds in order to maintain constant voltage at widely varying loads, according to Mr. Rushmore.

While the formal answer has not yet been drawn up, Mr. Rushmore states that the Barry patent covers a principle that is not practical and the Steinmetz patent is anticipated by the prior art.

TO REARGUE SPEEDOMETER SUIT

New York, Nov. 3—Serious illness which has befallen United States District Judge Platt will result in a rehearing of the suit of the Warner Instrument Co. against Stewart & Clark for alleged infringement of the patent covering the split-ring magnet used in the construction of speedometers manufactured by both companies.

The case was argued before Judge Platt in April and has been held under advisement by him ever since. Recently the dangerous character of the jurist's illness became apparent and as he was unwilling to delay matters further, he notified the litigants that the matter would have to be reargued.

A motion has been made to place the cause near the head of the current calendar and it is quite likely that a hearing will be had during the week of November 18. According to the attorneys, nothing new has developed since the original argument and the same briefs will be filed that were submitted before.

PREPARING TO MAKE MAXWELLS

New York, Nov. 4—The manufacturing schedule of the Maxwell-Briscoe Motor Co. for 1913 is being framed in accordance with the action of the United States district court which authorized the issuance of $1,500,000 of receivers' certificates to finance the undertaking.

Progress was reported by the officers who have the work in hand, but no inkling of its scope has been made public. The whole enterprise is a temporary expedient for the purpose of advancing the work so that it will be possible to turn out Maxwell cars for 1913 at the beginning of the marketing season.

The sale of the property to a reorganizing corporation and the continuance of its activities so that a sale can be made on a better basis than scrap are the immediate objects to be attained.

The deal with the Flanders Motor Co. remains in a state of uncertainty. It has been announced at United States Motor headquarters that appraisements have been made on each side and that agreement as to terms is a mater of negotiation. It was positively stated that no official development would be announced prior to November 11, when the form of the decree of sale will be discussed before Judge Hough.

In the meantime the outstanding stocks of the parent corporation and the claims of the creditors are being deposited with the Central Trust Co. and it is said that the total of claims now deposited amounts to nearly 75 per cent.

SHIPPING RELIEF PROMISED

New York, Nov. 4—Good news of the industry was contained in the optimistic statements issued by numerous representative railway officials as to the alleviation of the shortage of freight cars and the prospect for an adequate supply by the time the motor car shipping season begins. The net shortage up to November 2 was more than 40,000 but to the gratification of the motor industry it is announced that the exceedingly heavy movement of grain during October has brought forward the peak of the railroads' load so that it will probably be passed before the end of November. The total net shortage is 12,881 more than reported at the last fortnightly period. Presidents of the Atchison, Wabash, Illinois Central, Northwestern and Great Northern report full traffic but little congestion. The New York Central, but Erie have more than they can handle, but both roads are hopeful about cleaning up in a few days.

The fine weather for shipping during the past 6 weeks is generally given as the reason for the degree of facility with which the situation has been handled. If the weather continues good through November and fairly good in December, the traffic problem will be normal during the car shipping season, according to railroad officials.

What amounts to unofficial notice has been served upon the railways of the United States by the interstate commerce commission that the railways must adjust the present arrangements concerning the prompt return of freight cars that have been diverted from their own companies. Franklin K. Lane, of the commission, calls attention to the fact that it is little less than stealing for one railroad to withhold and use the cars of another railroad, par-

ticularly during periods of stress like that noted in the present grain movement.

The commission has issued a circular to the railroads to increase the speed of freight trains and calling attention to the fact that 25 miles a day is too small an average movement for freight cars. Another recommendation is for a higher per diem demurrage charge so that poorly equipped companies will have less motive for withholding the cars of better equipped roads.

James S. Marvin, traffic manager of the N. A. A. M., has a statement from one railroad which has 175 motor cars, showing that on November 1 the company had only sixteen of the cars in service on its own lines. The remainder, 159 cars, were being used by other roads; needless to say that their service is not in the shipment of motor cars.

The attitude of the interstate commerce commission is simply that it insists that the railroads remedy an inexcusable situation themselves or else the commission will take jurisdiction.

ATLANTA DEALER KILLED

Atlanta, Ga., Oct. 28—H. Vincent Connerat, manager of the Atlanta branch of the Buick, was killed tonight while trying to cross in front of a Central of Georgia train. The accident occurred between Jonesboro, Ga., and Atlanta. Mr. Connerat, riding alone in his car, was returning from Macon, Ga. The road and the track parallel for most of the length and Mr. Connerat, who was a daring and none too careful driver, had been racing the Central Flyer. An abrupt crossing, which he must have forgoten, left him with only the alternative of taking a fence or crossing the track. He tried to make the crossing but despite the fact that the engineer put on brakes the engine struck the car square in the middle, lifted it and then dropped it under the wheels. The train went half a mile before it was stopped. Mr. Connerat leaves a wife and two children. His body was buried in Savannah, his old home.

CANADIAN CONCERN SHOWS PROFIT

Toronto, Ont., Nov. 2—The annual meeting of the Russell Motor Car Co., of Toronto, developed no new features of particular moment. While an increase of dividend on the common stock has been expected for some time, no action was taken along that line. The company at present pays 7 per cent. The annual report, which showed net profits of $10,127, was unanimously adopted. The old board of directors was re-elected as follows: J. N. Shenstone, president, Toronto; T. A. Russell, first vice-president and general manager, Toronto; E. B. Ryckman, second vice-president, Toronto; George A. Cox, Toronto; Lloyd Harris, Brantford; J. W. McConnell, Montreal, and A. E. Ames, Toronto.

Frank Wheeler Buys Out His Partner

Because of Ill Health George Schebler Quits Carbureter Business

INDIANAPOLIS, IND., Nov. 4—Frank H. Wheeler has bought out the interest of his partner, George M. Schebler, in the firm of Wheeler & Schebler, manufacturers of the Schebler carbureter. The business will be continued by Mr. Wheeler without change in firm name, Mr. Wheeler to be sole owner. The consideration has not been made public.

The growth of the company, which has been conducted as a partnership, has been almost phenomenal. Mr. Schebler, who was a mechanic in moderate circumstances, brought out the Schebler carbureter and found himself without sufficient capital to develop and manufacture his invention. Mr. Wheeler became associated with him, and the two started in an extremely modest way in small quarters on the second floor of a building in North Alabama street.

In a remarkably short length of time the business had outgrown its quarters and it was found necessary to erect the enormous plant that is now operated on the south side of the city. This plant is said to be one of the largest of its kind in the world.

Mr. Schebler has been obliged to retire from the firm on account of ill health. He may devote most of the next few months to traveling, in the hope of improving his health. His physicians have advised him for some time that he must retire from business. His final decision to retire was made only last week and his offer to dispose of his stock was taken by Mr. Wheeler, who realized the state of Mr. Schebler's health.

CRUDE RUBBER MARKET

New York, Nov. 4—Crude rubber was easier again in the world's markets during the past week. The price level sagged to a basis of $1.01½ for up-river fine and was steady in the plantation grades, pale crepe standing at $1.02½. While actual sales amounted to practically normal volume of business there was little selling pressure and less active bidding. Receipts continue to increase from both plantations and indigenous fields.

INDIANA S. A. E. ELECTS WEIDLEY

Indianapolis, Ind., Nov. 4—At the first of the winter meetings of the Indiana branch of the Society of Automobile Engineers, held in Indianapolis on the evening of October 31, officers for the ensuing year were elected as follows: George A. Weidley, Premier Motor Mfg. Co., chairman; Herman G. Deupree, Remy Electric Co., secretary, and Chester S. Ricker, Henderson Motor Car Co., treasurer. The topic of the meeting was self starters, the speakers being W. G. Wall, of the National Motor Vehicle Co.; W. E. Raiguel, of the Ignition Starter Co.; Chester S. Ricker, of the Henderson Motor Car Co.; Joseph Lamb, of the Ignition Starter Co.; E. V. Hartford, of the Hartford Suspension Co.; Charles Crawford, of the Cole Motor Car Co., and Howard Marmon, of the Nordyke & Marmon Co.

S. F. EDGE RETIRES

London, Oct. 24—The English motor industry was surprised today by the announcement that S. F. Edge, one of the most prominent manufacturers in Great Britain, has sold his interests in S. F. Edge Limited to D. Napier & Son Limited, and that he has relinquished his executive position with S. F. Edge Limited. H. T. Vane, who has been associated for many years with Mr. Edge, succeeds him as managing director. No reason is given for the move nor does Mr. Edge state what he intends doing in the future, but it is thought he will not be identified with the motor industry hereafter.

SITUATION IN CALGARY

Calgary, Alta., Nov. 2—Eighteen months ago, when Calgary, Alta, had a population of 50,000, it boasted of having more cars per capita than any other city in the world. At that time there was one car for every nineteen families in the growing city. With a population now of 71,000, and growing at the rate of 1,000 a month, Calgary again bids fair to regain the honors it held 18 months ago. Almost every day sees arrivals of new cars in the city and the local dealers have found themselves unable to cope with the demand. Practically every important make of car in the United States and Canada has now an agency in Calgary. Several large new garages have been opened within the past month and others are under construction. Many believe that there will be too many garages in the city in a short time. A year ago there was a great demand for garage space, but too many have entered the business.

ATLAS SECURES HALTENBERGER

Indianapolis, Ind., Nov. 5—James W. Lyons and his associates who recently purchased the Atlas Engine Works, have engaged J. Haltenberger as engineer. Plans for the output of the coming season have been matured. Sample Knight engines now being shipped are of the four-cylinder type, with a bore of 4½ inches and a stroke of 5½ inches. The factory is getting ready for the manufacture of six-cylinder samples, of the same bore and stroke to be followed by smalled fours and sixes. The Hoosier plant will turn out 4,000 motors for 1913.

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Road Racing and Its Lessons

THIS week Motor Age publishes its annual review of the contests for the 1912 season, in accordance with a practice it has followed for several years. The review this time is not so favorable so far as the American industry is concerned as it has been in previous years. For the first time a foreign car is labelled the national victor, and the champion driver is one who has every right to be claimed as an American because of his many years on the American track, although of foreign birth.

THAT a foreign product has carried off the premier honors cannot be overlooked by the American maker in spite of the fact that a 45-per cent tariff wall exists and the further fact that the American selling organization of many of the European products is confined to but a very small portion of the American continent. The European car has proven its superiority in road events. The grand prize, the Elgin, the Vanderbilt, Santa Monica and Tacoma races have been carried off by foreign machines. America has to content herself with victories on the track and in the smaller events, those of piston displacements under 450 cubic inches.

THE contest play, as it has been staged during the present season, up to the final fall of the curtain, has not been the most advantageous advertisement to the American industry. Although the dollar-and-cent loss because of foreign victory is not dangerous, nevertheless it shows superiority of construction in special racing machines over that of the American maker, who has set out to build his special speed creation with the aim of eclipsing the foreigner. It is true that only three foreign makes have taken a part in the major portion of the play, but it is true that all three have made good by showing their ability to stand up and their rights to speed laurels. Balanced against this has been a divided American industry so far as its attitude towards contests is concerned. The major portion of the industry is opposed to racing, opposed to touring tests and opposed to contests in general. Those who have gone into contests have represented two wings of an industry, one desiring to hold as closely as possible to stock construction with the aim of generally benefiting its product; and the other setting out to create special racing machines with the hope of developing greater speed and endurance than any other machines, foreign or domestic.

THE maker who depended on his stock-type machine placed his only hope in reliability—ability to go the distance at a creditable speed. The maker who went into the freak car construction generally reaped a harvest of barren regrets—aiming to incorporate too many ideas into his machines and meeting with failure at many turns. Between these two wings has been the happy medium, the maker who set out to develop a special racing machine along rational lines of design, but aiming at higher speeds by refinements in construction and attending to the best features of design.

OF these three elements in the American industry, the maker who has kept close to the stock line and the maker who has set out to build a rational machine on refined lines have come out best in the total season. Their machines have given a much better account of themselves. The builders who have developed freaks have lavished money to the four winds and reaped humiliation. Those who want to bring out something new and marvelous must take lessons from the foreigner, who, when bringing out a new type of racing machine, drives it over the roads of Europe for several thousand miles before its speed ability is ever tested. This done, it is returned to the factory and taken apart piecemeal. Every part is gone over with the utmost accuracy to see if the machine has the necessary stamina to even withstand the ordeal of rough touring. If it satisfactorily withstands this treatment it is re-assembled and given its months of speed workout before it is even considered to enter it in a big speed event. After all of this preparation, these new cars often develop weaknesses in the first few contests and have to undergo minor changes, but the general result is that the design possesses many merits and is eligible for continuing from season to season with ever increasing good results. There is shown to be a definite purpose in the design, incorporating principles of construction that will give excellent results for many years to come.

IN contrast with this are several examples in the American racing history in which tens of thousands of dollars have been dumped into the racing pot and not a shadow of permanency to exhibit for it. The companies engaged engineers, who went off at tangents, worked along unknown lines, produced failures from which there was scarcely one point of real value obtained. This is expensive contest experience. It is unnecessary contest experience. It is foolish contest experience. It is experience that leaves you further back at the end of the season than you were at the beginning. It is experience that wrecks public confidence and also goes far to wrecking factories.

THE lessons of racing are not all learned. Every road race has much in store for the manufacturer who goes into it to develop his product and try out the latest that his engineering department offers. Unfortunately many makers think the winner is the only one to benefit from the contest. This is far from the truth. Every race contestant who gives a reliable performance gains prestige and makes sales. Thousands and tens of thousands who witness road races would not want a car as speedy as the winner. They are looking for the reliable car, for the consistent performer—in a word, the car that can start, go the entire distance and finish without trouble. So long as racing continues will this value continue with it; and so long as racing continues, so long will makers competing learn valuable lessons providing they make the racing program a department of the factory, the same as the laboratory, the final testing and the special testing and make a study of racing.

MOTOR AGE hopes that 1913 will record more sensible participation of American companies in road racing than has 1912. Some of the companies have been specially sensible this season, but the average is low. Already the biggest race for next season has been limited in piston displacement; this augurs well for a rational season. Let the makers be sane in their programs It is not necessary to be all hog or nothing. There is good opportunity for a limited participation in racing events in this country by a score or two of makers.

Is Motor Organization of Great Merit

Scottish Automobile Club Is Well Worthy of Emulation in America

By George W. Gaidzik

LONDON, Oct. 25—If every state in the United States had one motor car organization like the Scottish Automobile Club, what a boon to the motorists of the country they would be. The Scottish Automobile Club is the controlling body on all matters relating to the motor car movement in Scotland. Its objects are to promote, encourage and develop the motor car movement in Scotland, and to afford means of organization, information, advice, assistance and protection in matters pertaining to motor vehicles and the movement in general.

Of course there is hardly a state in the union which cannot boast of perhaps even several such organizations; but for thoroughness in carrying out the club's objects, there is none whose scope and activity excels that of the Scottish organization. Nor is the Scottish club the greatest organization of its kind in Great Britain, for it is only a little brother to the Royal Automobile Club of London. Being smaller but almost equally effective in its work, it should serve as a better example for other organizations working along the same lines.

The Scottish Automobile Club provides a commodious and comfortable but inexpensive club house in Blythswood square, Glasgow, with the usual social and culinary accommodations, and a motor house adjoining for the storage of members' cars. Each member receives weekly, post free, a copy of the Royal Automobile Club Journal, and annually, free of cost, the S. A. C. Year Book and the Royal Automobile Club Year Book, giving thorough information as to hotels, repairers, touring, etc.

The club affords all possible information and facilities for touring at home and abroad. The foreign customs arrangements known as the tryptique are available to members, and under agreement with the Royal Automobile Club the services of the continental agents and organizations are always at command.

It issues, under warrant from the king's secretary for Scotland, international traveling passes. It controls the recognition and appointment of hotels and repairers in Scotland on behalf of motorists in general; and it undertakes the erection of caution and direction posts where such are deemed necessary.

The club also affords free legal representation in any sheriff court in Scotland, and in any police court in England, Wales and Ireland, on the hearing of any summons arising under the motor car acts or regulations relative thereto. It gives free legal advice on matters relating to the motor car movement, and consideration proceedings in connection with the use of motor vehicles where any principle of general interest or application is involved.

The club has, in the interests of its members, undertaken and lent financial assistance in several important appeals to the court of judiciary, which is equivalent to the American supreme court, and has been the means of obtaining various decisions of great value and importance to motorists. It has appointed solicitors in various centers specially qualified to deal with motor matters, who act on behalf of members on specified terms. It represents motorists at all inquiries held in Scotland under the motor car act of 1903, a Scottish motor car law not unlike our own, and at other proceedings before any authorities in Scotland where the interests of motorists or of the movement are involved.

The club has been instrumental, in negotiations with public and local authorities, in obtaining many privileges for its members, and has done useful work in securing the improvement of roads and hotel accommodation throughout the country.

The organization has been active in its efforts to insure the careful driving of cars and the suppression of the inconsiderate driver. It cultivates reciprocal relations with kindred institutions, and is associated under treaty with the Royal Automobile Club. In fact, the Scottish Automobile Club is the administrative portion of the Royal Automobile Club in Scotland, and every member is, ipso facto, an associate of the Royal Automobile Club, and entitled to the use of club rooms in London set apart for the use of such.

It has a list of correspondents throughout the country who keep the general committee of the club advised on all matters relating to the movement throughout Scotland. It conducts examinations in Scotland for proficiency in driving and mechanical knowledge, and keeps a register of motor servants.

Under a special arrangement with the Car and General Insurance Corporation, members are entitled to a special S. A. C. policy and to a rebate of 10 per cent from premiums for the insurance of their cars. Its membership is situated in and representative of all parts of Scotland; and it controls in Scotland all trials and competitions of motor vehicles.

The S. A. C. Year Book is published by the club with the primary object of affording a ready and concise means of information to members of the club on matters relating to motor car operation and touring in Scotland; and though it is intended on numerous matters to be supplementary only to the more comprehensive and complete information contained in the R. A. C. Year Book issued by the Royal Automobile Club, and which also is supplied to each member of the club, the R. A. C. Year Book is one of the most valuable little publications of its kind in existence.

This book contains: Memorandum relative to the work of the club; lists of office bearers and members; the constitution and bylaws; information regarding the advantages and cost of the club membership emblem and badge; form of application for membership to the club; complete details regarding the cost and means of obtaining driving certificates and certificates for mechanical proficiency; information as to the use of the registration of motor car drivers in the employment register, which is kept by the club secretary, of motor car drivers open for engagement; a list of the objects of the commercial vehicles department of the club; and a page of excellent information on courtesies and rules of the road, which are recommended by the club with a view to engendering good feeling on the part of the public to motor cars and motor cycles.

The publication also contains illustrations and a description of the club house; full information as to the use and facilities of the various departments, house rules, associates' headquarters in London, and a complete list of the maps and books in the library.

Record Show at Olympia

LONDON, November 6—(Special Cablegram)—Olympia show will be the greatest motor trade exhibition the world has seen. Every available foot of space is utilized and the value of exhibits amounts to $1,250,000. Many notable importing firms are squeezed out. There are 353 exhibitors, a record number, in car section, 119 in carriage section, 35 in components and accessory section, 150 in tire and wheel section, 39 in motor press, 8 in motor associations and 2 in car section. Great Britian has 45 per cent of exhibit, France 23 per cent, Germany 10 per cent, Italy seven per cent, Belgium six per cent, United States six per cent and Switzerland and Holland 3 per cent.

Protects Penn's New State Road System

that the association has not achieved too good a standing in the outside world so far as future credit is concerned.

Ralph de Palma winner of the Vanderbilt cup, and seriously injured by collision with Caleb Bragg's Fiat near the finish of the last lap of the grand prix, was dismissed from Trinity hospital as permanently cured at the end of last week.

MOROSS EXPLAINS MILWAUKEE

Chicago, Nov. 2—E. A. Moross, manager of Bob Burman, in a letter written from Indianapolis, denies that his bill for expenses turned in to Milwaukee for the participation of the Moross string in the road races was exorbitant. He declares that so far he has not been able to collect a cent from Milwaukee, that his expenses, which he states were promised him if he remained over to the postponed date, were legitimate and in keeping with the situation as explained to him by the promoters, and that if the dealers promote the 1913 meet he will not make an entry. He states that he was given a receipt in full for his entries, which were alleged to have been paid by a German hardware concern which desired to have the Benz in the meet. His hotel expenses totaled $371 and his garage bill was $100, which later was adjusted by the Kissel agent who runs the place. In the layover for the postponed meet Moross states he was compelled to retain his rooms at the Plankinton while he was in Pittsburgh and St. Louis—4 days in all—because the demand for rooms was so great he feared he would be unable to get accommodations in case he gave up his quarters.

RACE RESULTS AT SALEM

Salem, N. H., Nov. 2—The uncompleted program of motor races which were originally scheduled for October 12 at Rockingham park race track was run off here Tuesday when the Boston dealers who had cars entered conducted the events under their own auspices, no admission being charged. There were five events on the program. The first were the 1-mile time trials in which Harry Grant, twice winner of the Vanderbilt, won first and second places driving two Stutz cars, making a new record for the track here of 57⅘ seconds. Harry Cobe, driving a Jackson car won the 10-mile race with another Jackson driven by Charles Basle taking second. The 25-mile event was captured by Jack Le Cain driving a Stutz with Cobe in a Jackson second. The 20-mile match race between Grant in a Stutz, Le Cain in another Stutz and Basle in a Jackson was won by Grant. The final event was a time trial for amateurs with George Downs in a National, the only entrant, his time being 1:05. The races were well attended.

Governor Tener Refuses to Permit Trolley to Encroach on Highways

PITTSBURGH, Pa., Nov. 4—Governor Tener, of this state, has taken a position in which he shows himself the friend of the motorists and of others who make use of the new state road system. He refused last week to grant a charter to a street car company which has, as part of its line, a part of the state road taken up. This road system which will cost more than $50,000,000 when completed, will be one of the finest in the country. It will cover more than 8,000 miles. The governor stated, in refusing to give up part of one of the roads to the company asking for a charter, that he would take the same action regarding existing companies which wanted to extend their lines.

Under the corporation laws of the state, the governor has to pass on all charter grants to railroads, street railway lines and extensions. No line is allowed to begin work without the permit containing the signature of the governor. Many, both motorists and street railway men, have been watching the governor closely to see what action he would take with this first case of the kind. The state highway department has also been vitally interested in the action of the governor and has been quietly working to preserve the roads for all traffic but street cars and railroads.

The governor takes the position that no trolley line will be allowed to use the new road system or any part of it, as these lines, like the railroads, because of their rapid development, will soon be running on their own rights of way. He also contends that the demand for speedier transportation makes it impractical for cars to use the roads where other traffic also must go.

State Highway Commissioner E. M. Bigelow, of this city, does not believe in the car companies getting their lines down on the public roads as already, in many cases, the roads are graded, underdrained and ready for the car companies to lay their rails and ties without much trouble. He states that as the people's money was used to do this work, the car companies should not get the benefit. Mr. Bigelow also contends that the running of heavy cars would destroy the roads.

BOSTON DISCUSSES PARKWAY

Boston, Nov. 2—The metropolitan park commission of Massachusetts gave a hearing Wednesday on the plans outlined for completing various sections of the parkways for which the last legislature appropriated $200,000.

As a result of the hearing motorists have had it called to their attention again that the most important section of parkway necessary, and for which nothing has been done, is a section that would connect Boston with the Mystic valley and Revere beach boulevards leading to the north. So a movement has been started to bring about some sort of action toward compelling either the state or some of the cities to do something. These two boulevards are admittedly the best in the state, but there is no direct approach to them from Boston.

The plan now about to be agitated is to have a parkway made in Cambridge connecting with Commonwealth avenue in Boston, and going either across by the stadium to Harvard square or along the Cambridge side of the Charles river, passing Harvard college and then swinging down Washington street to Union square, Somerville and over the hill to the boulevard.

BOOM COAST-TO-COAST ROAD

Ottawa, Ont., Nov. 2—The Ottawa Valley Motor Association has decided to turn in and help in the plan for a coach or motor road from the Atlantic to the Pacific. The work will cost considerable and will take several years to complete, but the plans for its building are now well under way. As the road will pass through many provinces and cities, a great deal of legislation will be necessary for its building and it is in this way that the Ottawa association can be of assistance. As this city is the capital, the local association likely will undertake to assist the parent association in getting their legislation through.

MASON WINS A CENTURY DERBY

New York, Nov. 5—Before a crowd estimated at nearly 18,000 a program of races was given at Brighton Beach on election day, the feature of which was the election-day derby at 100 miles, won by Mulford in a Mason. This brought out a ponderous field of thirteen starters and reached out so far that darkness fell during the last third of the distance, causing the finish to be drawn in the dark.

The Mason pair finished the full course and were awarded the two chief purses; Wishart's and Pullen's Mercers came next with ninety-eight and ninety-five laps respectively. Minkers' Kilne covered ninety-two laps and the LeCain Stutz made ninety. Costellos' G J G was still running at the end, but it was several laps behind the Stutz.

The race developed a number of mishaps and while nothing should detract from the honors won by the Masons, the Stutz driven by Dave Lewis was eliminated at a fortunate point for the winners. The same may be said for the National and two

of the Mercer cars beside the ones that were placed.

The start was delayed about 30 minutes too long and the field was too large for the course, but fortunately no fatal accidents marked its running. At the end of the first 10 miles, the National led, with the Stutz pair close up. At 20 miles the LeCain Stutz showed in front with Thebaud's G J G second and the Ferguson Mercer third. At 30 miles the Lewis Stutz was out in front, running swiftly and steadily. His teammate was second and the G J G third. The LeCain Stutz blew a tire on the first turn and lost two laps, the G J G and Mercer, Ferguson moving up a peg. Whalen went over the embankment in the thirty-first mile, breaking the wheel of his National and putting it out of commission. Whalen and his mechanic were shaken up but not seriously hurt. Then the Lewis Stutz turned over at the head of the stretch, bending its front axle and eventually putting it out.

The last 30 miles were run in the growing darkness and the finish found the steady-going Mason at the head of the procession. Throughout the race both cars were prominent but not in the first flight. They suffered little tire trouble and the Mitchell Mason was in front until near the end, when Mulford came along and wrested it from his teammate. This meet marked Mulford's first appearance on a Mason.

The record was not disturbed owing to the caution necessary in the latter stages. The policing was inadequate to handle such a large crowd. It is estimated that 1,200 cars were parked at the track. Summary: cars were parked at the track. The meet was well handled and there was not a whit of criticism as to the quality of the sport furnished by the promoters. Summary of the races:

Ten miles for cars under 301 cubic inches—Stutz, Lewis, won; Mercedes, Wishart, second; National, Whalen, third. Time, 9:17.50. Also ran: Mason, Mulford; Stutz, Le'ain; Mason, Mitchell; Klinekar, Minker; Klinekar, Armsby.

Five miles for cars under 301 cubic inches—Klinekar, Ormsby, won; Mason, Mulford, second; Mercer, Limberg, third. Time, 5:01.20. Also ran: Mercer, Ferguson; Mercer, Pullen; Mason, Mitchell.

Ten-mile free-for-all—Mason, Mitchell, won; Stutz, Lewis, second; Mercedes, Wishart, third. Time, 9:47.55. Also ran: Klinekar, Minker; National, Whalen; Mercer, Ferguson; Mason, Mulford; G. J. G., Thebaud; Klinekar, Ormsby.

One hundred-mile free for-all—Mason, Mulford, won; Mason, Mitchell, second; Mercer, Wishart, third. Time, 1:42.11. Also ran: Mercer, Pullen; Klinekar, Minker; Stutz, LeCain; National, Whalen; G. J. G., Thebaud; G. J. G., Costello; Stutz, Lewis; Mercer, Ferguson; Mercer, Limberg; Klinekar, Ormsby.

LACROIX TAKES ON MERCEDES

New York, Nov. 4—Paul Lacroix has just signed a contract whereby he becomes the exclusive agent in the United States for the Mercedes car. The contract extends to 1920. The headquarters of the new concern, the Mercedes Distributing and Importing Co., of which Mr. Lacroix is president, are at 1770 Broadway.

Bay State Expects a Fixed-Speed Law

Massachusetts Fears Reasonable Limit Clause Will Be Dropped

BOSTON, MASS., Nov. 2—Is Massachusetts going to have a fixed speed law next year instead of the present law that allows a reasonable speed with no limit on the state highways outside of the thickly settled thoroughfares? That is what some motorists are pondering over following the action of the Massachusetts highway commission in placing a 25-mile an hour limit on the road between Nahant and Lynn. There has been some speeding over the road during the summer and as a result action was asked to put a limit on the road.

At first it was proposed to make it 30 miles an hour, but finally it was dropped to 25 miles and the highway commission authorized this limit. In discussing the matter with some motorists Chairman W. D. Sohier of the highway commission stated that the judges in the courts were beginning to interpret 25 or 30 miles an hour as excessive speed and motorists were being convicted of reckless driving for exceeding this limit. This conviction automatically suspends a man's license under the law.

So the germ seems to have been born, that if a fixed speed of 30 miles an hour is established by the state, no motorist can be convicted of reckless operation where he was going fast only, if he does not exceed this limit on the state highways. Therefore it would not be surprising if a bill was sent to the legislature by the highway commission or some one acting for it along those lines.

The commission has a habit of fostering legislation each year now instead of confining its efforts to executive duties. Arguments may be made from both points of view, but a fixed speed probably would be opposed by the majority of the motorists. That the commission has something in mind in the way of legislation is foreshadowed by its invitation to the directors of the Massachusetts State A. A. to meet the members of the commission and talk over motor affairs for future action.

SPEARE AGAIN CHOSEN

Boston, Mass., Nov. 2—The annual meeting of the Massachusetts State A. A. was held in Boston on Thursday. The directors reelected President L. R. Speare, of Boston; Vice-president J. P. Coghlin of Worcester and Secretary-treasurer James Fortesque of Boston. The legislative committee reported that twenty-five bills inimical to motor legislation were killed at the last session of the Massachusetts legislature and that the state association did much to bring about this result. It is planned to work harder to increase the membership because more legislation of even a more drastic nature will be brought up next year relative to the motor industry.

BIG TIME IN BUFFALO

Buffalo, N. Y., Nov. 1—Eight hundred and forty-six cars, representing an investment of approximately $1,000,000, were assembled at 9 o'clock last night in the 70 acres of parking space surrounding the country club house of the Automobile Club of Buffalo at Clarence, N. Y. The occasion was the club's annual Hallowe'en party, and the attendance, upward of 2,500 enthusiastic motorists, surpassed every known record in this country for an affair of the kind. Victor Roditti, member of the board of directors of the Automobile Club of France, with headquarters in Paris, was among the guests present. Mr. Roditti stated that in all his travels around the world he never before witnessed such an astounding demonstration of the social side of motoring.

SEEKING NEW ROAD MATERIAL

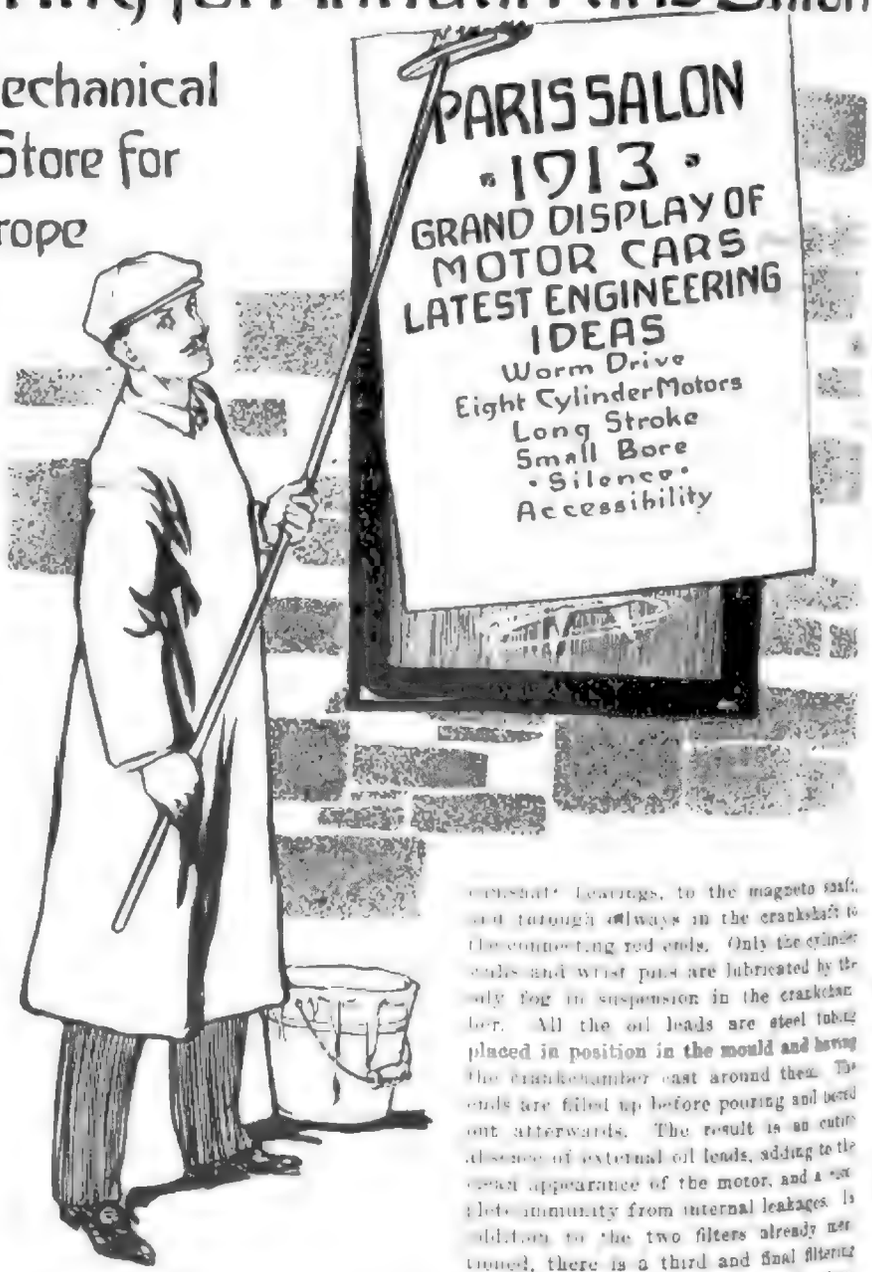
Savannah, Ga., Nov. 2—Chatham county is looking for a new material to be used in keeping its world-famous country roads in condition. The commissioners would be glad to begin early next year putting down a material that could be put in position as cheaply as gravel and wear longer. The roads of the county now cost $300 per mile per annum to maintain, even when they are kept up with convict labor, and this is considered a pretty good paving bill.

Most of the roads in Chatham county are paved for a width of 16 feet. It has been suggested that it might be a good thing to put in a roadway of 12 feet of some more lasting and durable material than gravel. Brick has been considered and discarded because of its initial cost. Asphalt block has also been given consideration, but it has not been adopted so far because of its cost. There is a composition made up of asphalt and small pebble size granite or other stone pieces, but this is not entirely adaptable to this section because of the great distance the stone would haev to be transported. In localities where the stone is easily accessible this style of road paving has been adopted with much success.

It has been suggested that it would be feasible to have a narrow roadway of say 12 feet in the center of the thoroughfare flanked on either side by a good gravel paving. This would give the drivers a road of sufficient width to use for ordinary purposes and the gravel could be employed for the purpose of turning out when one machine or horse-drawn vehicle meets another.

France Preparing for Annual Paris Salon

No Great Mechanical Changes in Store for 1913 in Europe



By W. F. Bradley

PARIS, Oct. 28—Detailed refinements which enhance the silent operation of the car, add to its accessibility, diminish the labor involved in dissembling for repairs, and lessen the attentions necessary to obtain continued satisfactory service will be strong features on next season's French models which will be shown at the Paris salon. So far as can be gathered from close inquiry and inspection before the opening of the shows, there will be few if any radical changes in design, but many alterations in details of manufacture and equipment.

Chapuis & Dornier Motor Unique

Many of the improvements common to most European motors can be understood by an examination of a new motor produced by Chapuis & Dornier, a firm specializing in small high-efficiency motors for the trade. Although valuable in itself, the example is taken primarily because it typifies the general tendency in European design. The motor has four cylinders in one casting of 2.9 by 5.1 inches bore and stroke. The dimensions may appear small, yet it is this size of motor which is being produced in France, and indeed throughout Europe, in the greatest numbers. It is considered possible to get enough power and speed out of a power plant of these dimensions to meet all requirements, whether they be long distance touring with an open body or suburban work with a heavy inside-steering body. In the Chapuis & Dornier the water circulation is by thermo-syphon, but as the motor is designed to be used on various types of chassis the outlet pipe can be mounted with its opening to either front or rear and the inlet can be either at the front or rear. With a radiator in front the rear opening to the cylinder jacket is closed by a bolted-on plate.

The crankchamber is not divided horizontally into two equal parts, but has detachable end plates in which the two main bearings are received and a detachable shallow base serving entirely as an oil reservoir. This method of construction is becoming general for small and medium sized motors, for it is now a very common practice to abolish the center bearing, the result being a lighter and more compact motor. Providing the shaft is properly designed, with bearings of adequate length, there is no whip, nor vibration.

Valves are on one side, operated by a one-piece camshaft, and tappets with adjustable heads and springs to maintain them constantly in contact with the face of the cam. Face diameter of the valves is 1.3 inches. One of the best features of this motor is the lubricating system. The base chamber contains about 1 gallon of oil, poured in through a wide-mouth tube also fulfilling the functions of crankcase breather. With the tube is an easily detachable filter, and along the full length of the crankchamber is another fine gauze filter through which all oil must pass on its way to the basechamber, after being forced out of the bearings.

Oil Circulation

A gear type of oil pump in the lowest portion of the basechamber is driven off the camshaft and carries the oil under pressure to the main bearings, to the two crankshaft bearings, to the magneto shaft, and through drillings always in the crankshaft to the connecting rod ends. Only the cylinder walls and wrist pins are lubricated by the oil fog in suspension in the crankchamber. All the oil leads are steel tubing placed in position in the mould and having the crankchamber cast around them. The ends are filled up before pouring and bored out afterwards. The result is an entire absence of external oil leads, adding to the clean appearance of the motor, and a complete immunity from internal leakages. In addition to the two filters already mentioned, there is a third and final filtering before the lubricant reaches the bearings.

Cast within the crankcase is a tubular oil chamber receiving through its base the main feed pipe from the pump and having a very fine gauze filter surrounding this pipe. The oil coming in at the center has to pass through the filter into the outer portion of the chamber and from there is led through the steel oil leads, already mentioned as buried in the casting, to the bearings. Provision is made for readily withdrawing this filter, for it is placed on the top of the crankchamber just to the right of the magneto, and can be pulled out by removing a couple of nuts. Whatever dirt may pass through the first two filters will be stopped here and can be removed readily on the withdrawal of the filter. The two main feed pipes starting from this filtering chamber have a couple of branches leading to the plain camshaft bearings, and a third one to the magneto shaft. The

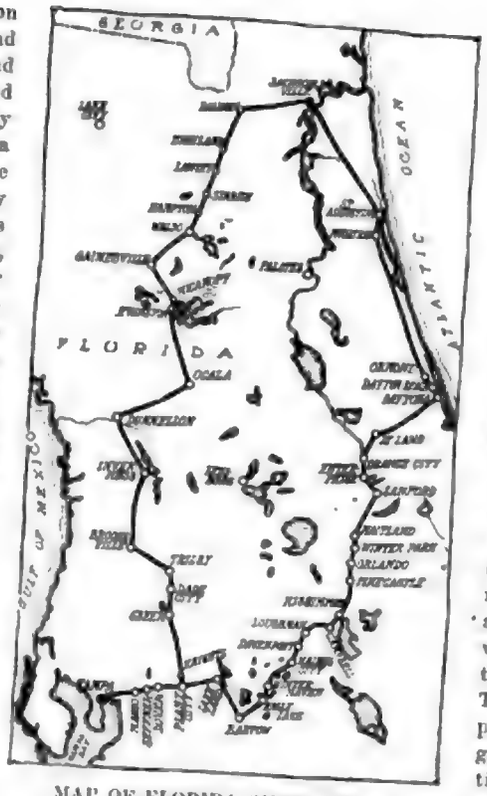
east coast, from Daytona to Tampa, Tarpon Springs and Belleair on the gulf coast, and touching many of the principal inland cities. During this trip we encountered very few bad roads, and was stuck only once, and that, for about 2 hours—on a new embankment which was mostly loose sand. For convenience in event of necessary delays between towns or where the hotels were very inferior, we carried a light tent, two sleeping bags, and a limited number of camping utensils easily stored and covered with waterproof canvas. We had no difficulty in purchasing necessary gasoline and oil at reasonable prices at all points. For the few meals, which it was found necessary to cook, there was an abundance of fresh eggs, strawberries, grapefruit and oranges always obtainable at very reasonable prices.

Start Made at Jacksonville

Beginning the trip at Jacksonville, special note was made of a very energetic good roads movement, and the earnestness with which the citizens of Florida were putting into effect the latest engineering data in the building of their new highways. Ancient and rotten bridges were being rapidly replaced with new ones, constructed of cement and steel, and the surface of the new roadways are covered with shell, marl, red clay or other material, making substantial, as well as pleasant roadways, to tour over. There are a number of short trips over good roads which can be taken from Jacksonville.

Jacksonville is the live business city in Florida. The fact that ocean-going ships can land their cargoes in the wholesale district, gives Jacksonville a great advantage as a jobbing center. Crossing the St. Johns river by public ferry to south Jacksonville, we proceeded towards St. Augustine, and arrived there in a little less than 3 hours, over fairly good roads, and enjoyed the pine flat-woods and expanses of waving palms.

St. Augustine, the oldest city in the United States, entered through the old "City Gates," is quaint, beautiful, historic, and interesting for its ancient stone buildings, erected by the Spaniards, its narrow streets, and old Fort Marion, with its parapets and noisome dungeons. Here Henry M. Flagler erected the million-dollar Ponce de Leon hotel and its adjunct, the Alcazar, both of which have beautiful surroundings, very restful and pleasing to the winter tourist. Mr. Flagler rejuvenated the ancient city by constructing waterworks, street car lines and paving some of the principal streets, largely at his own expense. From St. Augustine to the famous Ormond-Daytona beach, a distance of over, 50 miles over reasonably good roads, we covered in 3½ hours. We crossed several of Mr. White's unique motor car bridges. The road follows the old King's highway most of the distance. About 16 miles from Ormond we stopped at the Knox and Beede orange and grapefruit groves, which are of the largest in Florida. Proceeding a short distance, we crossed the new East Coast canal. This canal connects the inland waterways of the east coast from Palm Beach, on the south, to St. Johns river, on the north, making one of the most picturesque shallow draught winter yatching waters in America.



MAP OF FLORIDA CIRCLE TOUR

Good Golf Course at Ormond

Near Hotel Ormond we passed one of the best golf courses in Florida and rolled out onto the famous beach, whose hard sands constitute a highway from 1 to 200 feet in width, at low tide.

Imagine the joy of coursing over these hard sands, perfectly smooth and firm, without a crossroad or policeman in sight. Instinctively, one opens up the throttle, inhales the fresh, warm breezes wafted over summer seas, and the tired motorist feels like speeding on forever without thought of the morrow. Six miles down the beach from Ormond we passed the Florida East Coast Automobile Club, famous for all time to come as the place where the records show the greatest speed man has ever been propelled. A short distance beyond the club house we turned sharply to the right, leaving the smooth beach, crossing the peninsula and thence over ¾ mile of toll bridge, spanning the beautiful Halifax river at Daytona, and put up at the winter home of the writer.

Daytona on the east coast is well worthy of special mention. Here we have a new modern fireproof hotel costing $425,000, and something like thirty other hotels of various descriptions accommodating 15,000 to 25,000 tourists in the winter season. The city council has reserved for parkage purposes all of the live oaks draped with gray Spanish moss, and many other beautiful trees and shrubs, especially the stately palms. The entire city has cement sidewalks, shell streets, fine stores, and many beautiful winter homes.

Shell Roads Prevalent

Next we decided to go to Rockledge. From Daytona to New Smyrna we passed through long avenues of live oaks, with their somber canopy of Spanish moss overspreading the roadway for many miles.

New Smyrna, next to St. Augustine, is, without doubt, one of the oldest towns in the United States. Here we find the ruins of Turnbull Castle, Monasteries, old Spanish missions, and sugar mills, the latter worked in Turnbull's time by the Minorcans on the profit-sharing plan. Here are to be found immense live oaks, some of which have a girth of 30 feet and branches of great length. In early days the English and Spanish settlers gathered great numbers of oak ship-knees, and many a sturdy merchant-man and man-of-war boasted of these oak knees with strength of steel. Shell roads predominated until we reached a point about 35 miles south of Daytona. Here we encountered the Indian river flats, and had it not been a dry season we would have been obliged to turn back. We passed through Oak Hill, Titusville and a few other dilapidated towns, and reached Rockledge, 80 miles from Daytona, in about 6 hours.

Rockledge, on the Indian river, the home of the Indian river orange, and before Lake Worth came into prominence through Mr. Flagler's efforts was indeed the Palm Beach of the south. It is still a beautiful, quiet winter resort.

(To be continued.)

GATEWAY INTO ST. AUGUSTINE, THE OLDEST TOWN IN THE UNITED STATES

Packard Gearset Type

Peculiar Progressive Plan of Gear-Change Is Described and Illustrated for Motorist

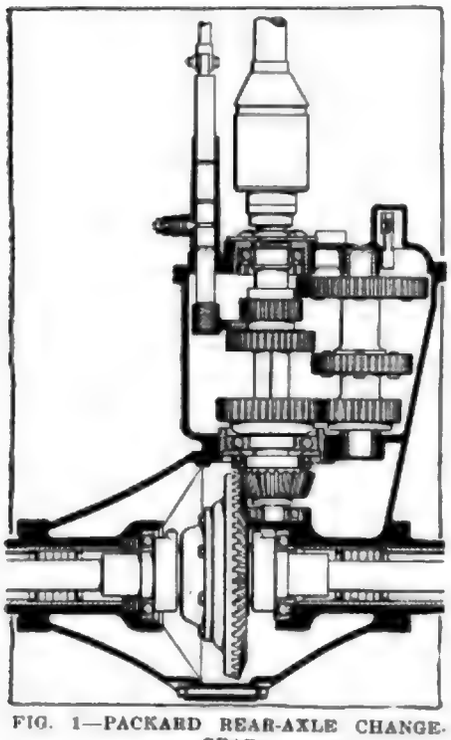


FIG. 1—PACKARD REAR-AXLE CHANGE-GEAR

HOWE, Ind.—Editor Motor Age—Please tell me what system of gearset the Packard uses. If progressive, can any desired speed be used for starting. If so, which ones? Please illustrate and explain.—S. L. Y.

The Packard gearset is of the progressive type, in which the neutral position is between low and intermediate speed. As in any other gearset, starting may be accomplished on any gear, although from neutral it is necessary to pass through second to reach high gear, and to press the lever sideways to attain reverse. In other words, all speeds are selective except the high gear, although the gearset is of the progressive type.

Fig. 1 shows this mechanism, which is situated as a unit on the rear axle. As shown, it is in neutral position. The transmission shaft transmits no motion to the countershaft, the gear at the extreme rear being free upon the transmission shaft. To engage first gear the control rod is pulled forward by a backward movement of the lever, which engages the two rear-most gears. Second speed is obtained by pushing the control rod back past neutral so that the two central gears mesh. Third speed is obtained by pushing the control rod all the way back, or the lever to the extreme forward position, which meshes the teeth of the central transmission-shaft gear with internal teeth on the back gear. Reverse is obtained by moving the lever to the left, when in neutral position. This actuates the small yoke, in the forward right-hand corner of the case. This raises a small long-pinion, beneath the forward gears, which meshes across with the low-speed gears. This is linked by a separate rod to the gear-shift lever, which is swiveled, and operates only on a sidewise motion of the lever.

The Readers

Gearshift Control on Packard Car—Illinoisan Designs 24-Hour Touring Body—Matheson Car Missing—Must Keep Lamps Lighted When on Public Roads

A DOCTOR'S MOTOR PULLMAN

Granite City, Ill.—Editor Motor Age—In reply to several inquiries regarding designs for pullman bodies, or sleeping arrangements, I desire to submit a sketch which I have used successfully for three seasons.

My car is so arranged that it can be converted into a pullman berth in a few seconds, without getting out in the weather. Simply unfasten two hooks at the back of the front seat, and there you are. There are no doors on the right side of the body, which makes it stronger. The seats are so arranged that in position they are very deceptive, in fact, one would hardly notice the separation in the seat, unless attention was called to it.

The body is 8 feet long and 3 feet, 6 inches wide. The bed when down is 6 feet long and is covered with a pullman hair mattress. The back of the seat hinges at the bottom and is held in place by two carriage hooks, and when dropped back rests on two supports. You will notice that the body hangs over the frame at the rear, also a box beneath for oils and extras.—F. E. Tulley, M. D.

MATHESON MATTERS

Bath, Md.—Editor Motor Age—In Motor Age, August 8 issue, a question was asked relative to the Matheson car which Jimmy Ryall drove at New Orleans, La., about 4 years ago. Motor Age was unable to give an answer. For the benefit of the inquirer would state that the car is in the Matheson garage, New York. It is chain-drive, and a four-cylinder, 90-horsepower car. I saw this car there when passing through on a tour through the New England states.—E. A. Twarts.

According to information received from the Matheson Automobile Co., the Matheson above mentioned is not now at the New York Matheson garage, nor has it been seen for several years. The last address available of Jimmy Ryall is Palace hotel, San Francisco, Cal. The car had a four-cylinder 6 by 6-inch motor, rated at 60 horsepower, but which would develop above 90 horsepower. It was a regular 1907 model with double-chain drive.

Law on the Tail Light

Lamp Must Be Lighted if Car Is on Street, Whether Machine Is Running or Not

CANTON, Ill.—Editor Motor Age—Is a person liable to arrest and fine under the Illinois motor car law, for leaving a car standing on the street or other public highway without the lamps being lighted, and burning, as specified under the head of lamps.

2—Define the meaning of the word "proceeding."

3—A case has come up in this city where the owner lighted his rear lamp and after running two blocks, less than 1,000 feet, entered a public building, and while therein was informed by an officer that the rear lamp was not burning and he was accordingly forced to pay a fine for the so-called offense. Has Motor Age any available decisions on such cases?—J. T. J.

1—Yes.

2—A legal proceeding is the prescribed legal action that is taken in response to a complaint. In this case it would consist of the arrest of the offender, his being required to furnish a bond of individual recognizance, summons to appear at court at its next session, and the trial and disposition of the case.

3—The action taken in the case referred to is perfectly legal. It is the owner's responsibility to see that he has his car equipped with a light that will not go out unexpectedly. Motor Age has no records of individual cases of this kind, but that such is the customary action in such a case, is known. If evidence is brought into court proving that the owner left his car upon the public streets or highways after sundown with the tail light not burning, the judge has no other recourse than to prescribe the legal penalty, in such degree of severity as he deems proper considering the extent to which the offense was due to carelessness on the owner's part.

Regardless of any precedent, it is so obviously against the letter and intent of the law to leave a motor car in the public highway without lights, jeopardizing the life and property of every other user of the road or street, that the owner who fails to take every precaution to insure himself and others against this danger is deserving of the full legal penalty.

Clearing House

Coal Oil as Anti-Freeze—Dislikes Present Design—Sudden Throttle Closure Causes Back-Fire—How a Minnesota Misfire Was Remedied

Kerosene for Cooling

Coal Oil Will Not Freeze, But is Dangerous in Use and Will Not Cool on Warm Days

CHICAGO—Editor Motor Age—Last year someone in the Dakotas wrote that he had replaced the water in his radiator with kerosene and defied freezing and all other radiator troubles after having shellaced the inside of his hose connections. Has any unfavorable experience been reported on that method or have any serious objections been offered?—W. R. G.

From time to time reports of wonderful success of kerosene are heard, but the experience of Motor Age has been such as to lead it to advise prospective users of this agent to observe extreme caution. As far as can be learned, kerosene is a good cooling agent only in extremely cold weather, as in weather above freezing it has been found to be a poor conductor of heat, requiring more cooling surface than water to prevent overheat. One case has come under our notice where on a moderately warm winter day a motorist using kerosene in his radiator found in 8 miles of running that his motor had overheated to such an extent that his ignition was affected, and his radiator leaked in a dozen places. He was forced to expend $30 to repair the radiator, and considerable time in bringing his ignition back to where it should be. In favor of this fluid, kerosene lubricates the pump, and if the hose connections are shellaced on the inside before using will not injure these parts, but is likely not to prove efficient in any but extremely cold weather. At all times, however, kerosene when warm is highly combustible, and emits an offensive odor. Alcohol and glycerine, mixed with water, will be found equally as satisfactory as kerosene in the prevention of freezing, and somewhat more economical. Formulas for the use of these agents were published in these columns in the issue of October 17th.

ECONOMY OF FOUR AND SIX

Lenox, Ia.—Editor Motor Age—I have a 30-horsepower six cylinder car. How many miles per gallon of gasoline should I get out of it?

2—Would I get more per gallon of gasoline out of a 4-30 than my 6-30?

3—With two cars of the same horsepower, which would take the more power, a 30-horsepower car with 36-inch wheels, or a 30-horsepower with 41-inch wheels?

5—Do the Dayton airless tires give as much satisfaction as the air type, and do they have as lasting qualities?

6—How many of the 1913 models are using the Delco self starting system? Name them.

7—Will the dynamo now used in the connector generate enough current to keep the motor running while one is using the starter? If so, why not have an electric as well as gasoline car. I have been told that it would.—A Subscriber.

1—Without knowing what type of motor you are using, the weight of your car, and the roads over which it is being operated it is impossible to say. With a car whose weight did not exceed 2,500 pounds and which was being operated on average roads, a well-designed motor should produce not less than 15 miles to the gallon of gasoline.

2—This, too, is difficult to say, as a well-designed six would be more economical than a poorly designed four. Theoretically, however, the four would show better fuel efficiency than the six, if both were perfectly designed, because of the inevitably greater weight of the six.

3—Presuming that the cars premised are otherwise the same, a car with 36-inch wheels would prove the more efficient on smooth and hard roads, while on the other hand, one with 41-inch wheels would prove the more efficient on soft, sandy, or hilly country. This is simply a question of leverage, where a lever is required, it is more efficient, where it is not, it is a useless hindrance.

5—Motor Age never has had an opportunity to test out these tires at first hand.

6—As all of the 1913 models have not yet been announced, a complete answer to this question is impossible. Of those announced, the Cadillac, the Cole, the Packard, and the Hudson, are using the Delco system.

7—This question is not clear.

Duryea Likes Editorial

Appoves Movement for Owners' Protection and Suggests Amplification of Scope

SAGINAW, Mich.—Editor Motor Age—The remarks of Motor Age on "owner's protection" are in line with a much felt want, but I doubt if they are the true remedy. No mechanic can tell the condition of a car until he tears it down and he is a wonder if, even then, he can tell how long it will take him to fix it up. Many defects only show after the parts are all apart and many times the fixing is a much more difficult job than it would seem at first glance. The result of such a method is that the garage owner either will lose money because the workman puts in much more time than was expected or else he must protect himself by guessing high enough in the first place. The only remedy with any given job is to put a good, intelligent man on it and pay the price, that subsequent developments show is fair.

But there is a remedy which protects the owner and begins much sooner. It is so fool-simple that one would think any owner would see it and favor it. But so long as he buys by sight and not by sense it probably will not be used. It is simply this: Buy only cars that have all parts accessible.

Motor Age is quite right in asserting that competent repair men will better the matter, and more right in calling attention of makers and motor car associations to the matter. They can remedy it. Let them give us accessibility contests, as well as races and tours.

Let all entrants drive around the track to show operability. Then let the judges call for a piston or similar part. The man who first gets the piston from his engine to the judge wins the first part of the prize. Then at a signal let the parts be returned to position and the car again driven to show operability, the winner to have the second part of the prize. This would, of course, require skill, but what contest does not?

Contests like this would in a few years cut repair bills to such a low figure that they would cease to be taken into serious consideration. Nothing would afford such an incentive to real progress as some education along this line. Manufacturers are not going to change their designs in this respect until they are forced to by public demand.

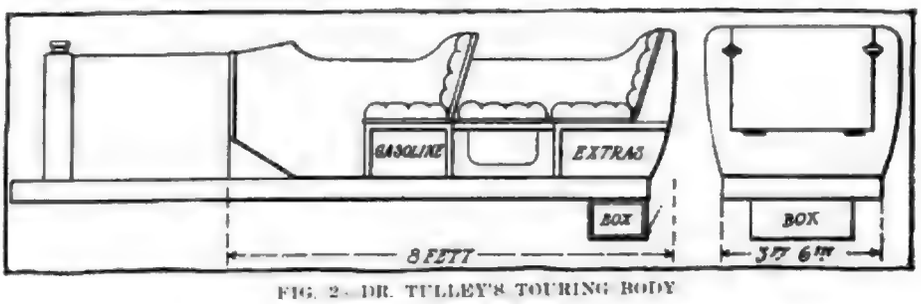


FIG. 2—DR. TULLEY'S TOURING BODY

The motor car for the masses must be small, light and simple and publishers should be educating to that end. The motor car business of the world can be had by the United States if we develop along this line. The success of one maker of light cars ought to be enough evidence of this.—Charles E. Duryea.

A MISS AND ITS REMEDY

Minneapolis, Minn.—Editor Motor Age—An acquaintance and friend of mine has been troubled with a large amount of missing in cylinder No. 1 in his touring car, and has tried very nearly all advice which has been offered. Finally he came to me for advice.

After going all over the ignition system and finding it in good order I thought I would take a look at the plug in the offending cylinder to see if it was as it should be for perfect work. He assured me he had put in three new plugs.

I took my wrench and took out the plug and the first thing I noticed was the points were too far apart to do the right kind of work. I at once proved this to his utter satisfaction, by first laying the plug on the cylinder head and running the motor with three cylinders. The spark would dy to pieces, look scraggy, jump from one point to the other but hardly ever right between the points where it should go.

We tried it on the batteries and magneto but the result was almost the same. There was a light reddish spark with but little hot in it and so wide across the spark-gap, that even the fiery magneto could not properly boost it across the gap.

I reduced the gap about one-half and then made contact with the head of the cylinder as before. I put on the batteries and a careful turn to the contact point showed that my medicine was most truly effective inasmuch as a bright, blue purple, continuous stream of fire was constantly running between the plug points as long as contact was made. Nothing like the one before was to be seen. No long threadlike pale red, intermittent fire was in evidence. We now placed the plug in its seat and I turned the switch over onto the magneto and the second turn of the crank brought instantaneous response and the deed was done.

The missing was no more in evidence, but in its place a very steady fire of every cylinder was the result.

When a motor is right it's right, and wrong, wrong. It is so very easy to find out by being careful to get the facts for a base from which to calculate upon, but asking so many questions of the editor who is not familiar with the case brings not nearly half as good results as to get right down and find out what is wrong with your motor and remedy it yourself. In other words: Get familiar with every part of your car and know how to fix them when they go wrong, as wrong they will, at times, go, and then you will have much more pleasure from your car and the trips you take with it.—U. R. Mason.

Throttle Causes Popping

Sudden Choke-Offs Cause Back-Fire Because of Weak Valve Spring

EDINA, Mo.—Editor Motor Age—I have a 40 horsepower car and I notice that it backfires, or pops, when, after speeding the car up to 35 or 40 miles per hour, the throttle is suddenly closed. Is this due to some fault or is it merely the nature of some engines? Have had three other cars and never noticed it before.

2—Why does not Barney Oldfield participate in races any longer?

3—By whom is the Jay-Eye-See racing car made?

4—What is the world's record for speed, and by what driver and car is it held?

5—What is the horsepower formula used by the Royal Automobile Club of Great Britain?

6—What is the name of the largest motor car ever built, how many cylinders has it, and what is the bore and stroke? The writer refers to the car with the largest engine.

7—By whom is the so-called wild-cat whistle made?—Motorist.

1—This back-firing or popping is caused by your inlet valves, which are not as tight as they should be. When the engine is run at high speed and the throttle suddenly closed, the volume of gas admitted to the manifold is much too little for the speed of the motor, and while the motor is slowing down to the proper speed for such a slight opening, a vacuum is created on the suction stroke of each cylinder that is not filled in the short inlet valve opening, from the small throttle opening. The result is that on the compression stroke, when normally the compression is great enough to seal the valve tight, there is still a vacuum in the cylinder, so that the valve remains open, due to slow spring action. What charge there is in the cylinder collects in two or three strokes and is ignited by the spark with the inlet valve partially open. This causes it to back-fire through the carbureter. Sometimes the compression and volume of the charge is not sufficient to ignite, so that it is expelled into the red-hot exhaust pipe and muffler; where the hot carbon fires it. To totally eradicate this by adjusting the valves alone you would have to increase their tension to such an extent that they would not only not open properly, but would wear unnecessarily. The best plan is to fit stiffer springs, with the same adjustment. It must be understood, however, that sudden throttling is not to be advised, as the engine is not intended as a brake. Always throttle and accellerate moderately, and use the spark in conjunction, using the clutch or clutch and brake to slow down.

2—Barney Oldfield is still in the racing game, having made a good showing recently at Milwaukee in the Grand Prix.

3—The Jay-Eye-See is the old Fiat Lewis Strang formerly drove and which has been modernized by Louis Disbrow.

4—The fastest speed in a horizontal direction ever made by man was attained by Bob Burman in the Blitzen Benz at Daytona Beach, Florida, on April 23, 1911, the time being 25.40 seconds for 1 mile, a speed of 141.73 miles per hour.

5—The R. A. C. formula, used by the Royal Automobile Club of Great Britain is the same as the old A. L. A. M., now the S. A. E. formula. It is as follows:

$$\text{Horsepower} = \frac{D^2 N}{2.5}$$

In which,

D=Diameter of the cylinder in inches.
N=Number of cylinders.

6—What is claimed to be the largest motor car ever built was made to the order of the Chief Inspector of Finances of France. It has a wheelbase of 198 inches, a six-cylinder engine of 160 horsepower and an eight-passenger body. The largest motor ever put in a motor car is claimed to be that in the Jay-Eye-See, which is the old Strang Fiat, with a bore of 9¾ inches and a stroke of 8⅝ inches.

7—This whistle has never come to the attention of Motor Age.

SWEATING OF INTAKE MANIFOLD

Vicksburg, Miss.—Editor Motor Age—What is the cause of intake manifold sweating until water runs and drips off? This is a four-cycle 20-horsepower engine which seems to run and develop good power. Is it right for the manifold to get wet? Is it not caused by the air inlet spring on carbureter being too strong causing a hard suction through the air adjustment?—J. A. Williams.

The sweating of intake manifolds is caused by the condensation of the water in the air next the manifold, due to its low temperature. This low temperature is due partially to the vacuum present in it at medium to high motor speeds, caused by the engine suction; and principally to the rapid evaporation of the gasoline. As a general thing this phenomena is more noticeable with a slightly rich mixture than when the mixture inclines toward leanness, as the greater the percentage of gasoline there is in the mixture passing through the manifold, the more rapid will be its evaporation, and hence the temperature drop caused by the evaporation of the volatile spirit will be correspondingly greater.

There is no harm in this sweating, provided you are getting good results and economy from your motor. However, a cold manifold is likely to cause condensation on the inside of the manifold, condensation, in short, of the charge. This of course, depends to a large extent upon the length of the manifold, as in a short manifold there is less likelihood of this resulting than in a long one.

The air adjustment, if wrong, would undoubtedly augment this tendency, as it would produce a richer mixture than it

normal, but if this were the case your motor would probably not give you good power and would give off a strong gasoline odor. Several American and European manufacturers waterjacket their manifolds to remove this effect, or build them into the cylinder block. The reason for this is not so much that the effect of a cold manifold is itself feared, but is because increased fuel efficiency results from a pre-heated charge. A waterjacketed carbureter, or warm-air intake, will remove this tendency in the same manner. In winter a layer of ice from the condensed moisture in the air often forms.

MISSING OF FORD

Union, Ia.—Editor Motor Age—What is the matter with my model T Ford when it will spark only in two plugs? At one time one plug will give a good spark, and the next day it will be another plug. It has a master vibrator. Would the timer have anything to do with this? I have adjusted the vibrator but this does not seem to help.—Reader.

By the wording of the above it is inferred that you have taken the pains to assure yourself of the fact that you are not getting a spark in the plugs to which you refer, and that the trouble is not from a poor mixture, loss of compression, etc. If you get a good spark at times in one plug, and not in another, and at other times in the other and not in the one, the trouble clearly is in the timer, or in an imperfect circuit. The master vibrator cannot be blamed for this, as a failure in this member would affect all of the plugs alike. The same applies to the magneto.

Your statement regarding the vibrators removes all doubt as to these members. The next place to look is in the timer. Take it apart and look at the contacts. If they are worn or badly grooved, replace the defective parts, clean it thoroughly with gasoline or kerosene and replace it. If this does not correct the fault, there is no other way to find the trouble but to go over every inch of wiring in the system, looking for the three possible causes of current leakage—short-circuits, loose connections or broken wires and damaged insulation, which may produce ground leakage or short-circuits with other wires.

The most likely cause of your difficulty, if you are certain that the trouble is in the ignition system, is a loose, worn or dirty timer. If all of the above efforts fail to locate the difficulty, have some competent expert examine the coils for internal grounds, which may have developed. If this is the case, to repair it may be found as expensive, or nearly so, as replacement with a new coil. A new coil is always preferable to a repaired one, as a faulty coil is either a poor one or an old one, either of which should be replaced with a new coil in good condition. If the timer is worn, the parts may be replaced very cheaply, or an entirely new timer purchased at a nominal cost.

Defends Reversible Gear

Gopher Motorist Defends Opinions Attacked by Irreversible Adherent

SAUK CENTER, Minn.—Editor Motor Age—I am glad to welcome W. J. Marlin into the steering-gear arena, but we must assume for argument sake that Mr. Marlin has taken my article in Motor Age too seriously and that his explanation of his preference for the irreversible type proves that his argument is not very logical as applied to my proposition regarding the reversible type so much liked by those who have used the several kinds. Mr. Marlin says, "The irreversible steering gear is used by more manufacturers than any other type," which is true, but this really proves nothing from a logical using standpoint, as these same manufacturers also use many things from a mechanical view that are not what they should be.

Take, for illustration, the sliding gear-set, which has been called by the very highest mechanics "a mechanical monstrosity," but still the makers of motor cars use it. Does this fact that they use it prove it to be better than other forms of transmitting power to machinery? No; not a bit. The fact that has been advocated in Motor Age from time to time in reference to accessibility of parts, tire construction, etc., not only by the editorial department but by correspondents as well, has changed the mind of only one tire maker, so far as I am informed, who puts one ply more fabric in his tires, with many firms selling inner liners to make the tires safer and more durable, which would prove that they are not built as they should be. Still could one say, because the majority of tire makers used five plies of fabric eight plies were not better? One car manufacturer, who makes and sells thousands of cars yearly, uses exclusively the reversible type of steering gear, and could he not make the irreversible if he thought it best? Certainly. I did not mean street-car tracks in my article, but the tracks made by a motor car when toiling through mud nearly hub-deep; gumbo soil, which when dried acts like a rasp on the soft rubber. Any device which holds these same tires tightly to the sides of these ruts for a certain fact is far more expensive to the user than one which will slightly give a trifle, thereby saving the sides of the tires.

There is no disputing the fact that the reversible gear is much more easy to keep in order, and two to one, will wear three times as long as the irreversible type, all conditions being equal. And as for one riding a bicycle hands off and hitting a minute object in the road finds himself in the ditch is not argument against the gear of which I write, but this illustration was used to show the real easiness that is attending upon one who by the slightest touch of his steering wheel can guide his steed so accurately and with no effort to speak of.

The first car I owned was not of such very antiquated make for, indeed, the same company are today still making motor cars and as high in price as $4,500. Up here in the Gopher state we do not have as good roads, I feel certain, as they do in Mr. Marlin's state, so we like the quick-acting gear in the place of the old standby. Also we do not buy many $3,500 to $7,000 cars either, but we have one of the last named in our city, and it is rather slow in turning, but of course turns! I will bet Mr. Marlin a dollar anyhow, that if he will tour up into the Gopher state I will so please him with my reversible gear that when he returns to Pennsylvania he gets one of them—but will never let me know it—and will truly abandon the "awkward, clumsy" type of slow-moving gears!

Pray, Mr. Marlin, how are you to take up wear on the cogwheels used in their reversible type? I have seen adjustments on these gears, but like Flanigan and his money, the play was still in the steering gear, and we formed our judgment from the fact that the wheel would turn about 2 or 3 inches before it affected the forewheels of the car. One of these men who defends the irreversible type which is on his car blandly told me he liked to have the wheel turn 2 to 3 inches before it was effective because he could steer better! This same man can hit a telegraph pole or farm wagon about the easiest of any driver I ever met, and reminds me when I was driving an irreversible-geared car one night with a load of passengers. I ran over a bull, I am most certain that the irreversible was to blame for this ungentlemanly act. However, no one was hurt but the bull, a mudguard and a searchlight. I don't want any more irreversibles in it for me.—A. D Carpenter.

CHARGING WITH FORD MAGNETO

Loudenville, O.—Editor Motor Age—Some time ago I saw an article or an advertisement in one of the motor journals of a storage battery that could be charged from the magneto on a Ford machine, but cannot find it now. What is the address of the firm or firms that make such a battery?—H. J. Truscott.

The Ford magneto is an alternating current generator, and as such cannot be used to charge any type of storage cell. Either a direct current generator must be used as a current source in charging storage batteries, or the alternating current must be rectified. This may be done by means of a commutator on the generator armature, or with a mercury arc, or other type of rectifier. No rectifier now on the market is practicable for installation in a motor car, and Motor Age never has heard of installing a commutator in a Ford magneto. If you wish to charge a storage battery on your car, install a direct-current dynamo or magneto for this purpose.

The Realm of the

Chicago Department Stores to Use

About 1,600 Horses Will Be Displaced by Pending Haulage Change

By William B. Stout

DOWNTOWN Chicago department stores are planning to do away entirely with horses and substitute the motor truck for all delivery. In the list of those thus planning are Marshall Field & Co., Mandel Brothers, Carson, Pirie, Scott & Co., the Boston Store, The Fair, etc. About 1,600 horses will be displaced by commercial motor vehicles when the change is finally completed.

This will mean the operation of between 700 and 900 more motor vehicles than are at present in use in Chicago. Taking 750 teams and wagons from Chicago's streets and substituting motor vehicles will mean a saving of nearly 2 miles of street space, to say nothing of the gain in other lines of the city's progress.

Educating Chicago

For some time the various Chicago department stores have been using motor trucks. The first machines were of large tonnage and were used for hauling the heavy transfer loads from the main stores to the delivery substations north, west and south. The machines were put into use not with any thought of financial gain other than that resulting from better service. With the motor vehicle the load could leave the downtown store an hour later than was required of horsed wagons, and arrive at the shipping or distributing point in time to meet the small horse wagons there, at the regular schedule hours for delivery. Thus each truck saved 1 hour for each of three or four deliveries a day. This paid in service. After a time it was seen that if certain things could be done with the trucks to keep them continually moving that they could be made to pay actual dividends over horsed service.

Then it was that a few large gasoline cars were put in for furniture work, delivering bulk loads in house-to-house work. These trucks are now doing better in the matter of cost than any other machines in the department store service, some of them running 60 to 100 miles a day. One van for Marshall Field's is quoted at the latter figure.

When it was found that these machines were a success smaller ones were tried out by a couple of the firms, notably Marshall Field & Co., for the longer hauls to the suburbs. In this work loads were smaller so that small trucks were put to work. These running from 6 to 9 miles from the store before commencing deliveries then engage in house-to-house delivery work and have provided a success both as to service and cost. From 1 to 2 hours is saved on each delivery and with more reliability than was possible with horses, especially in winter work.

These machines did not prove a success in near-at-hand delivery, however. In fact, most of the downtown firms never even tried them out in this work, knowing from their own study and figuring that they could make better time with the horse equipments where so many stops and waits were involved. It was then that the electric vehicle began to be considered.

At first with these vehicles there was the great disadvantage of limited mileage, but this has now in part been overcome. Chicago is an ideal city so far as topography goes for the operation of electrics with their great weight since there are no hills and pavement stretches in all directions from the central district. True, some of this is poor paving but every year sees some improvement. With no hills and many good road surfaces with much of congestion as well to contend with, the electric has a good chance to make a showing over the gasoline car for the short hauls and many stops.

Trying Out Electrics

First trials were made of electrics by such firms as the Boston Store and Carson, Pirie, Scott & Co. The results were not at first what they should have been, but with the added experience of mistakes made, each firm which has tried electrics is planning to purchase more.

At first charging methods were wrong. Too much current went into the batteries for what was gotten out of them. Batteries were spoiled by misuse, drivers abused the cars on the road and by poor choice of routes and roads which used up too much current, had to be towed home. A few months of this, however, and each firm had a stock of information on what to do and what not to do, and a corps of drivers competent for the work.

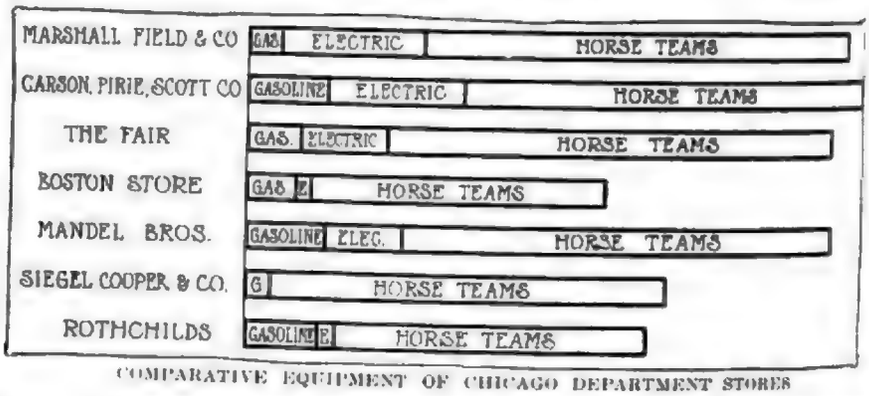
Electrics in the house-to-house work near the stores proved a good investment and they were then put to work at the substations in package work.

Working in Outlying Districts

Carson, Pirie, Scott & Co. equipped their Evanston station 13 miles north of the store with electrics and tried them out. The result was so successful that this firm now is planning to do away with some 290 horses and substitute motor vehicles. Most of these will be electrics for house to house work. This firm also uses a 5 ton electric for the hauls to and from the store to the warehouse 2 miles away.

The heavy hauling to the substations is all done by gasoline cars. These run for an average of 6 miles from the store to the substations north, south and west and there the load is taken off and distributed to the wagons for the different routes. Originally horse vehicles of small size were in use for this final distribution and package work. Now electrics are planned for all of this except suburban work where fast gasoline cars of small tonnage will be used.

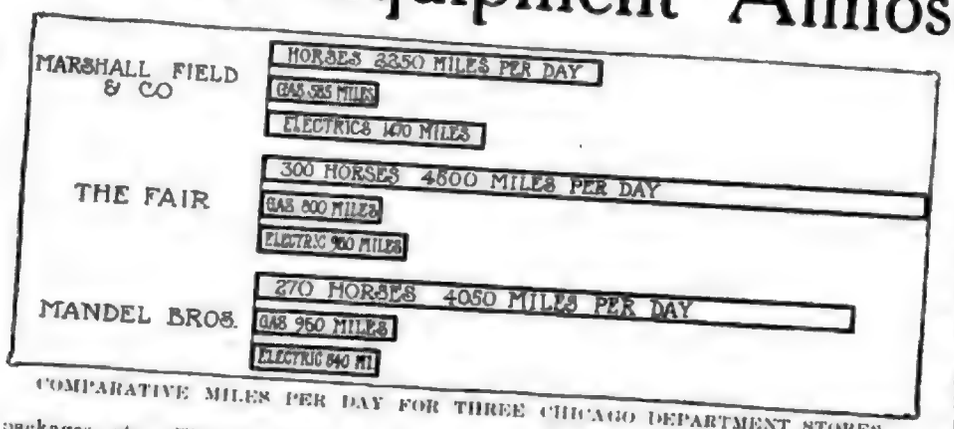
This firm is also using two three wheeled motor cycle delivery vans for quick runs to the warehouse with rush



COMPARATIVE EQUIPMENT OF CHICAGO DEPARTMENT STORES

Commercial Cat

Motor Equipment Almost Exclusively



COMPARATIVE MILES PER DAY FOR THREE CHICAGO DEPARTMENT STORES

From 700 to 900 Power Vehicles Will Be Added to City's Fleet

packages, etc. The chief difficulty is in getting drivers to operate them carefully over the rough cobble pavement between the store and warehouse. The first men through careless driving injured the vehicles. Carson, Pirie, Scott & Co. are in favor of very small, fast vehicles of this general type for the quick work, though four wheels would be an advantage on the rough roads.

Mandel Brothers have in service at present twenty-four gasoline cars, twenty-four electric machines and some horses. Some of the electrics have been operating for 3 years but the majority were put into service recently. Gasoline cars handle the substation and furniture work.

Electric Service Efficiency

For everything but the most congested routes the electrics pay handsomely and even there are successful on account of service efficiency and the advertising of up-to-date equipment. Mandel Brothers plan to have complete motor equipment within 2 or 3 years. The delay is only in arranging business conditions and allowing things to shape to the new systems without too great a revolution. More gasoline cars will be added for the bulk hauling.

Marshall Field & Co. are using in all fifty-one vehicles and 298 horses at the present time. Nine of these vehicles are gasoline and forty-two electric. The horses are to be entirely replaced, mostly by electric wagons of small size. This will mean the addition of some 150 motor trucks to their delivery fleet.

Field the Largest User

The nineteen gasoline cars now used pretty well take care of the long distance work of this form so that the bulk of the new machines will be for house-to-house delivery. This will mean electric equipment for the most part. This firm is at present the largest user of motors in the Chicago department store field.

The Fair has at present sixteen gasoline trucks, and twenty-six electric wagons in use with 300 horses. This firm also is enthusiastic over motor vehicles and as service conditions allow it is adding to the fleet. For the same reason given before probably three-fourths of the new machines will be electric vehicles, mostly of around 1,500-pound capacity and to be used for house-to-house work from substations.

The Boston Store is operating eighteen motor trucks, sixteen gasoline cars and two electrics. The installation of more electrics is planned on the completion of a new garage now building when more machines will be installed as a beginning toward the entire motorization of the delivery department. Electric wagons are favored for the house-to-house work and gasoline for long hauls.

Seigel, Cooper & Co. operate four 3½-ton gasoline trucks and no electric cars. Some 225 horses are used also in the house-to-house work. This firm is not yet convinced of the coming of the motored vehicle for this latter branch of work but is enthusiastic over the hauling of the big machines for transfer work and furniture hauling. The eventual motorization of this equipment would mean possibly 100 motor vehicles.

"We favor the gasoline truck," said the shipping clerk of this firm, "on account of its mileage capacity. It can do things impossible to the electric. For instance, we had a breakdown on the north side one afternoon. A big truck from Hammond got in about 4 p. m. and was sent north with a load at once. With an electric this would have been impossible. It would have had no charge for the trip. Again sometimes there is an extra bulk delivery like a talking machine and cabinet we sent out today. The gasoline truck can make a detour and deliver this at a point 1 mile west of the regular route. With an electric I couldn't do it on account of low mileage.

One Word for the Horse

"With horses on the house-to-house work too the driver is out and on the way to the door before the vehicle stops. With the motor he cannot do this. He has to stop the vehicle first. Of course I can send an extra boy."

The electrics are being watched closely for the package work and it is likely, according to those in charge, that electrics will be tried out. Judging from the experience of other stores in the same city this will probably mean their adoption.

Rothschild & Co. are using thirteen gasoline cars and two electric wagons. About 175 horses are operated in Rothschild's delivery work. Of the motor trucks three are used for transfer work, two for furniture hauling and the smaller cars for su-

TRUCK EQUIPMENT OF CHICAGO DEPARTMENT STORES

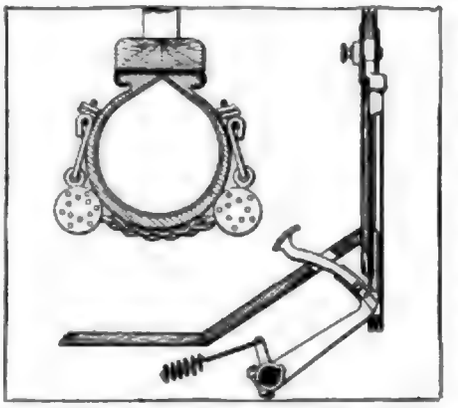
Store or Firm	Gasoline machines	Electric wagons	Horses used	Contemplated motor vehicles, approximated
Marshall Field & Co.	9	42	298	150
Carson, Pirie, Scott & Co.	24	41	280	155
The Fair	16	26	300	150
The Boston Store	16	2	120	95
Mandel Brothers	24	24	270	125
Siegel, Cooper & Co.	4	0	225	100
Rothschild & Co.	13	2	175	...

Jackson Tetreau
Geology

Current Motor Car Patents

TWO-CYCLE Motor—No. 1,042,888—To Alphonse Butsch, St. Lucia, British West Indies. Filed October 29, 1910, dated October 29, 1912. Primary compression is effected in this motor in the crankcase, on the two-port plan. The intake is through a bi-pass in the crankcase, which communicates respectively, with the combustion chamber and the crankcase, through a vacuum chamber, disposed between the bi-pass and the crankcase intake. Ball valves are situated in the inlet passage and the intake from the carbureter. On the up stroke of the piston, a vacuum is produced in the crankcase which draws the gas through the intake passage. Upon the down stroke of the piston, the gas is compressed in the crankcase. Upon reaching the bottom of the stroke, the inlet port in the cylinder is uncovered, and the compressed gas enters the combustion chamber. Lubrication is accomplished by means of an oil cup connected by a tube to the cylinder just below the bottom of the piston stroke. A port in the piston is adapted to register with this opning whn the piston is at the top of its stroke, viz.—when the vacuum in the crankcase is the greatest. This permits the suction to draw the oil into the crankcase, where by a suitable tube, it is lead to the wrist pin, and by a drilled connecting-rod from thence to the crank-pin.

Anti-Skid Device—No. 1,042,722—To Turner W. Simmons, Bridgeport Conn., assignor of one-sixth to William C. Bowers, Bridgeport, Conn. Filed November 24, 1911, dated October 29, 1912. An anti-skidding chain, this device differs from those of similar nature in that the chain is used only as a supporting and actuating means, the skid-preventing element consisting of a series of ball connected in the cross chains at either side of the tire, so that in ordinary running, they are merely carried by the tire, and are under no pressure. Side friction, however, exerts a side-pull on the chains, drawing the outer ball toward the point of road contact of the tire, jamming it and preventing further skidding.



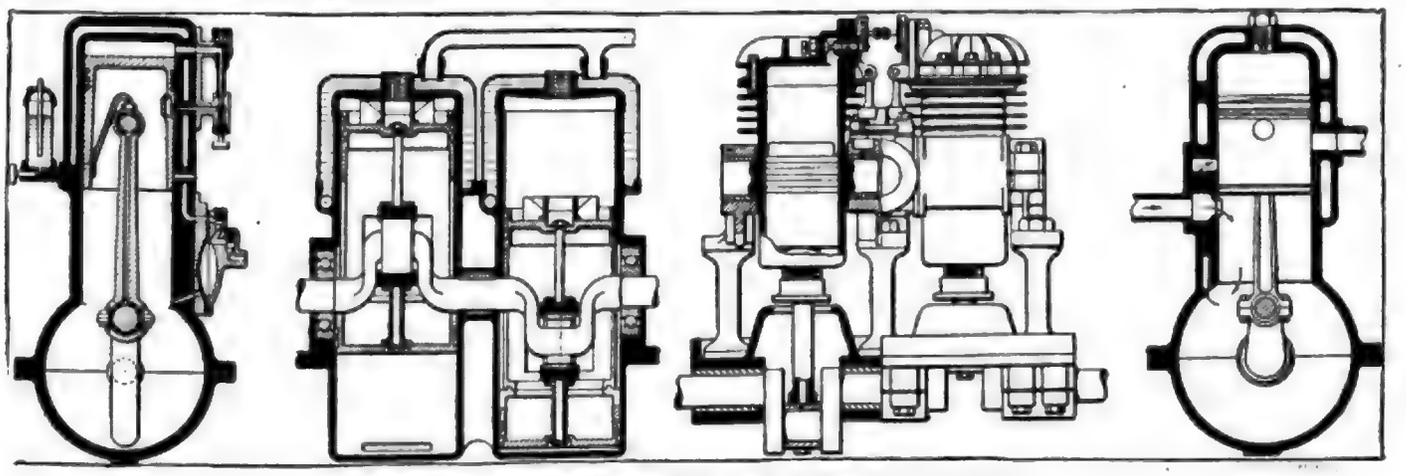
SIMMONS ANTI-SKID AND BREDE LOCK

Clutch Pedal Lock—No. 1,042,639—To Carl T. Brede, Detroit, Mich. Filed June 28, 1911, dated October 29, 1912. As a measure of prevention of unauthorized use of a motor vehicle, this device consists of a lock plunger, mounted on the dash, and extending downward to a position, adapted to engagement with a lug on the clutch-pedal arm, when the latter is in the extreme disengaged position. This lock plunger is inclosed in a stationary tube, and secured by a lock, so that it may be raised out of, or locked in engagement.

Reversible Gas-Engine—No. 1,042,540—To Orville H. Ensign, Los Angeles, Cal., assignor of one-half to Paul H. Blades, Los Angeles, Cal. Filed August 29, 1906, dated October 29, 1912. Reminiscent of early steam-engines, this engine operates on a principle new to internal combustion engine practice. The cylinders are of the closed, double end type, mounted on trunnions and pillow-blocks. The pistons are secured to rigid piston rods, which in turn, are secured to the cranks of the crankshaft, so that the cylinders oscillate in response to the rotary motion of the cranks. The lower cylinder chamber is used as a compression space, and the upper portion as an expansion chamber. The carbureter is connected to the cylinders through a tubular axle upon which the two cylinders rock upon the central pillow-block. This tubular axle communicates with the compression chamber upon the piston reaching the extreme upward portion of its stroke. The downward stroke of the piston compresses this gas, and upon the piston reaching the bottom of its stroke the compressed gases are allowed to pass through a passage to the combustion chamber, through a piston-opened port.

Three-Port, Two-Cyle Engine—No. 1,042,503—To Fredrick A. Thurston, Lynn, Massachusetts. Filed September 29, 1908, dated October 29, 1912. This patent is extremely broad in its claims, as it covers a two-cycle engine wherein the intake is through the side of the cylinder, uncovered by the piston, when the latter is at the top of its stroke, admitting gas into the crankcase, where it is compressed, and admitted to the cylinder through a transfer passage, and a cylinder port uncovered by the piston on the lowermost portion of its stroke. The exhaust is located opposite these ports, and is uncovered by the piston similarly to the manner in which the inlet is opened.

Another Twombly Motor—No. 1,042,505—To Willard Irving Twombly, New York, N. Y., assignor to Twombly Motors Co., New York, N. Y. Filed October 5, 1910, dated October 29, 1912. Of two-cycle design, this motor resembles the Holsman four-cylinder motor, in that a single piston is used in two cylinders, and the reciprocatory motion is transmitted to the crankshaft through a laterally sliding bearing on the crank, thus dispensing with a connecting rod. The lower of the cylinders is used as a compression chamber, and the upper as an expansion chamber.



BUTSCH, TWOMBLY, ENSIGN, AND THURSTON MOTORS

Novelties for Use of the Motoring Public

of the air is fast, but not so rapidly when its speed is slow.

To lessen the proportion of air to gasoline at high speeds, the air-valve V is provided. This valve is in the form of a funnel-shaped tube that rises in response to the air pressure, as augmented by the engine suction, and is lowered by the spring S, when this pressure becomes less, as at slower speeds. The action of the throttle is as usual. But one adjustment is provided, which, it is stated need never be molested, once the proper adjustment for the engine has been obtained. This is in the form of a needle valve, in the top of the feed tube.

A metal float is used, which required no adjustment, and mica windows at the side of the float-chamber permit of observation of the float level. The Air-Friction Carbureter Co., Dayton, O., is the manufacturer, and the Gray & Mack Sales Co., Chicago, is the western distributor.

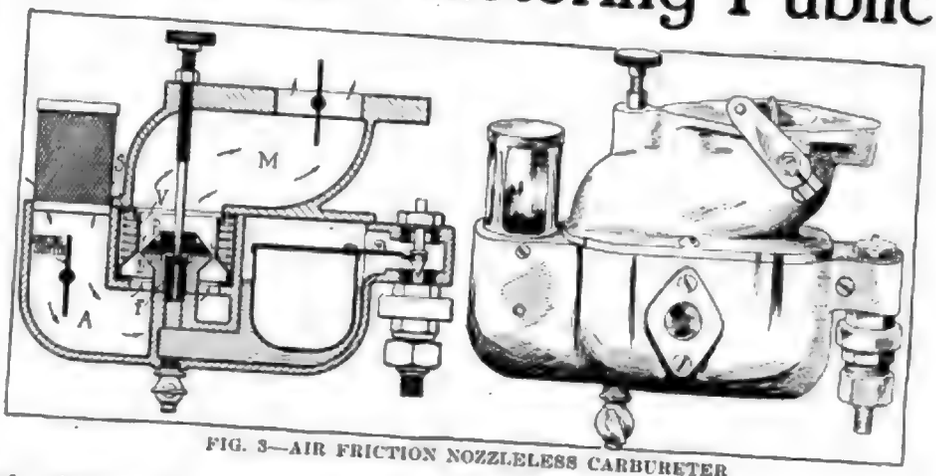


FIG. 3—AIR FRICTION NOZZLELESS CARBURETER

Turner Motor Washer

Like cures like but there is something better than elbow grease for the removal of motor grease. That is gasoline vapor. When vaporized and projected in a strong stream on the parts to be cleansed, gasoline is not only most efficient as a cleanser, but this is the most economical method of using it. A good way in which to use it in this manner is with the aid of the Turner motor washer, Fig. 4, which is a small hand instrument holding a quart of the fluid, which operates on the principle of a blow torch, with the exception of the substitution of a spray nozzle instead of a burner. It consists of a tank of drawn brass, fitted with a Turner non-leaking filler plug. The handle of the device is in the form of a hand pressure-pump with which pressure in the tank is pumped up, forcing the air and gasoline in the form of a fine stream to cut caked and obstinate grease, and to reach inaccessible parts of the surface; or a wide spray, which quickly drenches the motor. Gasoline, however, should be used with extreme caution, as in the carbureter condition in which it issues from the device, it is dangerous. Kerosene may be used with equally good results, with safety, for indoor cleaning. It is said to be useful in spraying or watering plants or poultry, also. It is made by the Turner Brass Works, Sycamore, Ill.

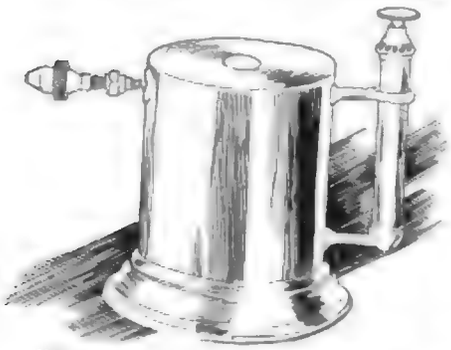


FIG. 4—TURNER MOTOR WASHER

Gilson Motor Starter

For those motorists who experience difficulties in starting, the Gilson Motor Starting Co., Indianapolis, Ind., has produced the Gilson motor starter and speeder. This device is a priming outfit, which contains the distinctive feature of a warm air intake. The supply of gasoline is carried in a small brass cup on the dash, which feeds to a three-way valve. From this valve a tube leads to the exhaust manifold, around which it is wound once, and another to the inlet manifold, into which it is lead, about 3 inches above the carbureter. In starting, the valve is turned to horizontal, allowing a small quantity of gasoline to pass from the container to the inlet manifold. The motor is then cranked, which causes a suction through this pipe and draws the gasoline into the cylinders, where it is ignited. This suction draws air through the tube leading from the exhaust manifold, which upon the starting of the motor, becomes hot, so that the mixture is preheated before entering the cylinders, which makes for efficiency and fuel economy.

Rust-Proof Metal Preservative

Claimed to be immune to the action of water, air, ammonia, alkali, acid, smoke, brine, lime, etc., Kane's metal preservative is offered to all users of metal as an outer covering that serves not only as a paint, but preserves the metal against all forms of oxidation, such as rust, corroding, etc., and which, it is said, will not crack or peel, but becomes a part of the metal, which cannot be separated from it. It is usually made in a deep black color, but can be furnished with coloring matter in its composition. It is prepared by a secret formula, which was discovered by accident by a compounder of printers' inks, who intended it for printing, but produced a metal preservative. It is especially adapted to iron bridge work and construction, but has its application to motor cars. It is used as a paint for rims, in which use it is said to make them immune to rust for life, and to be non-injurious to rubber. The Metal Preservative Co., Chicago, is the compounder.

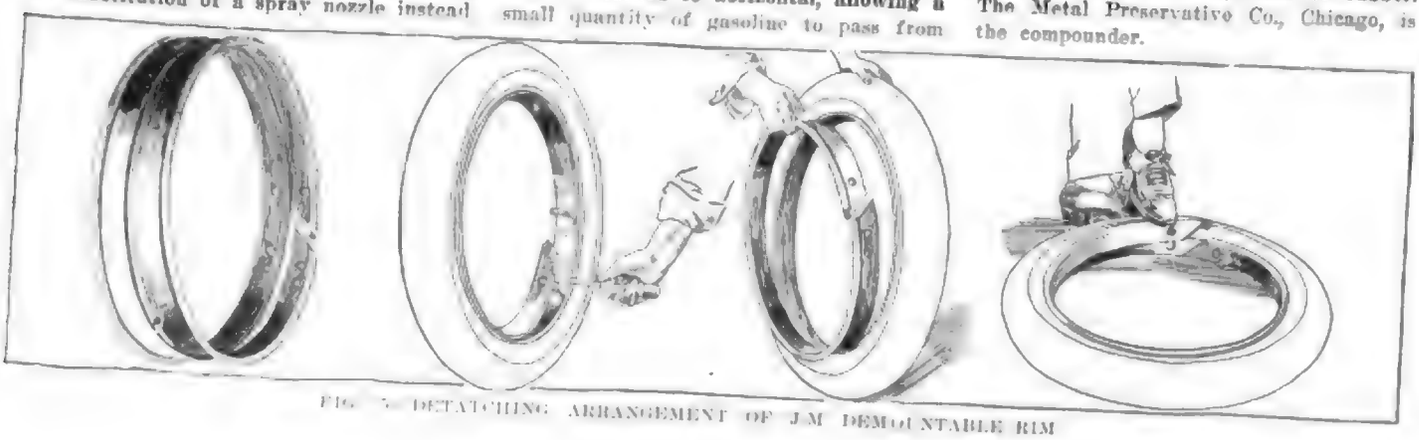


FIG. 5—DETATCHING ARRANGEMENT OF J-M DEMOUNTABLE RIM

Brief Business Announcements

Agencies Appointed by Pleasure Car Manufacturers

Town—	Agent	Car
Aledo, Ill.	E. B. Miller	Moon
Anderson, Ind.	Anderson Automobile Co.	Cole
Baxter, Ia.	Hager Brothers	Cole
Bayonne, N. J.	W. H. Dykeman	Cole
Boston Mass.	Dodge Motor Vehicle Co.	Buffalo
Blue Springs, Neb.	A. H. Krauss & Co.	Cole
Burlington, Vt.	Churchill & Lockwood	Cole
Canton, O.	E. J. Quigley	Cole
Canton, O.	Auto Service Co.	Moon
Canton, Ill.	Guy Coleman	Cole
Cedar Bluffs, Neb.	Ostrand & Lampert	Cole
Clarksburg, W. Va.	S. Scott Thompson	Cole
Clarksdale, Miss.	W. E. Campbell	Cole
Clio, S. D.	Covington & Smith	Cole
Charleston, W. Va.	J. H. King	Cole
Columbus, O.	Kaiser Motor Car Co.	Hupmobile
Columbus, O.	Engle & Vincent	Locomobile
Columbus, O.	Engle & Vincent	Velie
Columbus, O.	Snyder Automobile Co.	Abbott-Detroit
Columbus, O.	Edward Miller	Premier
Columbus, O.	Franklin Cycle & Supply Co.	Cole
Columbus, Neb.	A. J. Dischner	Cole
Cortland, N. Y.	Letts & Farrell Co.	Cole
Decatur, Ill.	North Main St. Garage	Moon
Dallas, Ore.	K. B. Kirk	Cole
Fort Smith, Ark.	Beehmer & Sheridian	Cole
Fremont, O.	J. R. Kiser	Cole
Greenwood, Miss.	W. S. Wright	Cole
Harrisburg, Pa.	Andrew Redmond	Maxwell
Harrisburg, Pa.	Andrew Redmond	Autocar
Harrisburg, Pa.	Harrisburg Auto Co.	National
Harrisburg, Pa.	Harrisburg Auto Co.	Reo
Harrisburg, Pa.	Harrisburg Auto Co.	Abbott-Detroit
Harrisburg, Pa.	Harrisburg Auto Co.	Oakland
Harrisburg, Pa.	Keystone Motor Car Co.	Chase
Harrisburg, Pa.	Keystone Motor Car Co.	Flanders
Harrisburg, Pa.	Keystone Motor Car Co.	Chalmers
Harrisburg, Pa.	Keystone Motor Car Co.	Studebaker
Harrisburg, Pa.	Paul D. Messner	E-M-F
Harrisburg, Pa.	East End Auto Co.	Stanley
Harrisburg, Pa.	Crispen Motor Car Co.	Overland
Harrisburg, Pa.	I. W. Dill	Cadillac
Helena, Ark.	B. L. Lyford	Hudson
Houston, Tex.	Northrup & Clark Co.	Cole
Itta Benna, Miss.	Townsend & King	Cole
Jonestown, Miss.	L. F. Weathersby	Cole
Keelogg, Ia.	Craven & Moberly Co.	Cole
Knoxville, Ia.	L. L. Bybee & Co.	Cole
Lebanon, Ind.	A. Lofland & C. Layton	Cole
Lexington, Miss.	E. Norquist	Cole
Louisville, Ky.	Miles Auto Co.	Cole
Marion, Ind.	W. Hillsamer & Son	Cole
Marrigold, Miss.	W. B. Park	Cole
Marshall, Mo.	Tipping Brothers	Cole
Marshalltown, Ia.	J. H. Fisher	Cole
Mason City, Ia.	Clover Leaf Co.	Cole
Meridi Yucatan, Mex.	W. H. James	Cole
Meridian, Miss.	E. S. Curtis	Cole
Mobile, Ala.	Block Brothers	Cole
Moro, Ore.	W. H. Moore & Co.	Cole
Mt. Pleasant, Tenn.	J. M. Granberry	Cole
Moneta, Ia.	Louis Ruwe	Moon
Mechanicsburg, Pa.	Charles Schroeder	Kline-kar
New Haven, Conn.	Knight Garage	Cole
New London, Conn.	Lathrop & Smith	Cole
Oblong, Ill.	Oblong Auto Co.	Cole
Oil City, Pa.	C. H. Weaver	Cole
Oklahoma City, Okl.	Oklahoma Motor Car Co.	Cole
Oakland, Miss.	Crow & Marder	Cole
Petersburg, Va.	W. P. Atkinson Co.	Moon
Providence, R. I.	Pawtucket Auto Co.	Cole
Phillipsburg, Pa.	H. B. Scott	Kline-kar
Rock Island, Ill.	Trerer & Snyder	Cole
Steelton, Pa.	Bartram Shelly	Kline-kar
Savannah, Ga.	Edward J. Thompson	Kline-kar
Scranton, Pa.	Harry S. Smith	Cole
Shreveport, La.	W. K. Nulsen	Cole
St. Marys, W. Va.	R. W. Russell	Cole
St. Louis, Mo.	Bagnell Auto Co.	Cole
Summerville, Tenn.	C. A. Oliver	Cole
St. Paul, Minn.	Owl Garage	Woods
Tarboro, N. C.	J. B. Pennington Co.	Cole
Toronto, Can.	Automobile Sales Co.	Moon
Van Meter, Ia.	H. V. Van Meter	Cole
Washington, Mo.	C. A. Krumsick	Moon
Wheeling, W. Va.	A. W. Loe	Cole
Worcester, Mass.	Palace Auto Co.	Cole
Youngstown, O.	Regal Sales Co.	Moon
Ypsilanti, Mich.	Cary S. Davis	Cole
Zanesville, O.	Wedge Garage Co.	Cole

OTTAWA, Ont.—The McLeod garage has opened its doors under the management of Sid Clemens and Thomas Baird.

Buffalo, N. Y.—The Buffalo-Hudson Sales Co. has moved into temporary quarters at 1133 Main street, opposite Summer street.

Holden, Mass.—The J. W. McIntosh Co. has just been incorporated at Holden to engage in the motor business. Mr. McIntosh is president and treasurer and Bertha M. and Henry Sickels are directors.

St. Paul, Minn.—Warren L. Seeley, secretary of the St. Paul Commercial Club, has resigned to associate himself with Merritt J. Osborn in the distribution of White gas and Detroit electric cars from St. Paul.

Acton, Mass.—The Davis-King Co. has been formed at Acton to deal in motor cars and supplies. It is capitalized at $20,000 and A. W. Davis is president; Hobart E. Mead, treasurer, and B. A. King, secretary.

Philadelphia, Pa.—The Lozier Automobile Co., 227 North Broad street, has acquired by long-term lease the stable property, 66 by 184 feet, at the southwest corner of Twenty-first and Ludlow streets. Approximately $40,000 will be expended to reconstruct the building at present on the site into a motor car sales building and garage.

Portland, Me.—W. M. Chellis, the Franklin dealer here, will soon open a service station at 684 Congress street.

Louisville, Ky.—The Yager Motor Car Co., agent for the Hupmobile and Peerless, has moved into the new garage at Third and A streets.

Philadelphia, Pa.—Through J. M. Aicher, a syndicate of car dealers is negotiating for the purchase of a property measuring 400 by 150 feet, bounded by Thirtieth, Thirty-first, Locust and Spruce streets, on the site of which it is purposed to build a huge warehouse to store automobiles.

Elmira, N. Y.—James Whitney, recently retired from the firm of Bishop & Whitney, has formed a new partnership with his brother, Albert E. Whitney, of Canaseraga, N. Y. The Whitney brothers will conduct garage in a building just purchased for $10,000 at foot of Dewitt street, corner of East Water street. The new structure is two stories in height and dimensions are 50 by 100 feet. The new concern will handle the Ford. Although the partnership between J. Bruce Bishop and Albert Whitney has been dissolved by mutual consent, Mr. Bishop will continue as proprietor of the garage at Baldwin and Gray streets, Elmira.

Dayton, O.—The Goodyear Tire and Rubber Co. has established a branch at Dayton at 15 East Second street.

Minneapolis, Minn.—Harry J. Mich, representing the Franklin and Knox lines, pin avenue, with the Regal Sales Co., Inc.

San Francisco, Cal.—Frank G. Miner has recently been appointed manager of the San Francisco branch of the Kelly Motor Truck Co.

Galion, O.—The Cleveland and Galion Motor Truck Co. has filed papers with the secretary of state decreasing its capital stock from $500,000 to $300,000.

Detroit, Mich.—The Ford Motor Co. of Canada, Walkerville, Ont., announces the engagement of A. N. Lawrence as sales manager. Mr. Lawrence formerly held a similar position with the Motor Wagon Co.

Fond du Lac, Wis.—The E. W. Clark Motor Co., owning and operating one of the largest agency and garage businesses in Wisconsin, is planning to considerably increase its storage and repair facilities. The company is district representative in the Fox river valley of the Jackson and

Premier, and has just closed for the state agency of the Hupp Motor Car Co., of Detroit, to handle its line in Wisconsin.

New Orleans, La.—Oakland cars are now represented in New Orleans by a sales branch in charge of W. C. Gray.

San Francisco, Cal.—C. E. Osborn has succeeded Harry Croninger as Pacific coast manager of the Speedwell Motor Car Co. in San Francisco.

Vancouver, B. C.—Charles A. Ross, of the McLaughlin Carriage Co., Ltd., has been appointed manager for British Columbia, succeeding H. W. White.

Philadelphia, Pa.—E. K. Leech has been made manager of the new Oakland branch in Philadelphia. Mr. Leech was formerly connected with the Automobile Truck Magazine.

Minneapolis, Minn.—Contracts have been let by the Searchlight Gas Co., Chicago, for two additions to the Minneapolis plant at 2400 University avenue S. E. They will be ready February 1.

Minneapolis, Minn.—The Studebaker Corporation Minnesota branch will erect a building, 44 by 100, at Fourteenth street and Hennepin avenue, on the new motor row in Minneapolis. The car business is now handled from the main building at Sixth street and Second avenue S.

Boston, Mass.—The American Marine Equipment Co., Boston, Mass., has had its name changed to the American Motor Equipment Co., owing to the fact that it has embarked in the motor accessory line and this business is now larger than the original marine engine line it also carries on.

Washington, D. C.—The United States Tire Co. has established a branch at 1303 H street, N. W., with E. H. Johansen as manager. The building at that number is being remodeled and when finished will be three stories high. Johansen will also manage the Baltimore branch to be opened January 1 next.

Austin, Tex.—The Oakland Motor Co. of Jersey City, N. J., has been granted a permit to do business in Texas. It has established headquarters in Austin with T. B. Cochran as agent. The capital stock of the company is $10,000. This company already has an extensive branch in San Antonio and recently established a branch at Houston with A. H. Challinor in charge.

Minneapolis, Minn.—The Twin City Motor Car Co. headquarters in Minneapolis, has filed letters of incorporation at Lemmon, S. D., capital $60,000. E. C. Thompson, former sales manager for the Abbott-Detroit, is to be manager. Paul J. Kallman, St. Paul, is president. The company will handle the Flanders gas and electric cars in Minnesota and parts of adjoining states. In St. Paul the company will handle the Saurer-Mack truck and the Detroiter. C. R. Newby, district manager, with Minnesota, the Dakotas, eastern half of Montana and parts of Nebraska, Iowa and Wisconsin in his jurisdiction, will have his office in the Minneapolis branch. Sites will be selected in both cities.

New Haven, Conn.—A. Fisher has severed his connection with the Mayo Radiator Co. and has removed to New York.

Toledo, O.—The McNaull Automobile Tire Co. has filed papers with the secretary of state increasing its capital stock from $50,000 to $75,000.

Baltimore, Md.—The local branch of the Goodyear Tire and Rubber Co. will move into its new quarters at Cathedral and Preston streets within a few weeks.

Austin, Tex.—A. W. Jones has taken charge of the Houston branch of the Ford Motor Co. as manager. He was formerly assistant manager of the Ford branch at Seattle, Wash.

Philadelphia, Pa.—Additional show room quarters for the Baker electric have been established at 1927 Market street by the Carroll A. Haines Co., Twenty-second and Spring Garden streets.

Boston, Mass.—The Ultra Motor Car Co. is the latest to be formed in Boston and it has a capitalization of $100,000 with R. H. Randall, president; Elisha A. Bagg, treasurer, and C. A. Parker, secretary.

Boston, Mass.—C. C. Edwards, who was manager of the Boston branch of the Marquette Motor Car Co. until it was discontinued in the Hub, has joined the sales force of the Boston branch of the Buick company.

Louisville, Ky.—Announcement is made of the formation of the Southern Motors Co. with a capital stock of $100,000. A. T. Hert will be president; R. A. Whitehead, of Detroit, general sales manager, and R. L. McCormick, vice-president. The company has closed a contract for the agency of the Hudson.

Boston, Mass.—George L. Lighthall, formerly manager of the Boston branch of the Marquette, has accepted a position with the Republic Motor Car Co., handling the Chevrolet and Little cars, and Ervin E. Stevens, until recently a member of the sales force of the Boston Matheson branch, has gone with the Henley-Kimball Co., handling the Hudsons.

Winnipeg—The Canadian Motor Co., Limited, has been organized with a capital of $500,000, to acquire the business at present carried on by the Fort Rouge garage and to handle the agency in western Canada for the Locomobile, Wolseley, Hudson, Cutting, Cameron gasoline cars and the Detroit electrics. The managing director of the company is E. S. Sherwood, president of Canadian Supply Co. This new concern will control three garages: the Fort Rouge garage on Corydon avenue, the City garage under construction on Portage avenue, and the electric service station erected by the Free Press next to its new office building. The general office of the company will be located at the new City garage immediately it is completed, temporary offices being at the Fort Rouge garage.

Fort Fairfield, Me.—Hopkins Brothers have let the contracts for a large combination machine shop and garage in the center of the town.

Boston, Mass.—J. L. Judd, manager of the Jackson Motor Car Co., of Boston, has just had turned over to him a service station at Cambridge, Mass.

Lynn, Mass.—T. Warren Bray, proprietor of a garage, has filed a petition in bankruptcy giving his liabilities as $5,314. The assets are $1,129.

Louisville, Ky.—The Wilder Motor Car Co., agent for the Flanders cars, is occupying its new salesroom in the Franklin building, Fourth avenue near Broadway.

San Francisco, Cal.—The latest San Francisco concern to announce change in headquarters is the Reliance Automobile Co. New quarters have been secured at 1655 Van Ness avenue.

Seattle, Wash.—The Seattle agency for the Rambler has been placed with the Rambler Motor Car Co. and spacious quarters have just been opened at 307-9 East Pike street. The firm is headed by D. W. Naughton.

Birmingham, Ala.—Tops, cushions and covers are being manufactured here by the recently organized Birmingham Auto Top Co. This is the only plant of its kind in the south. The company is capitalized at $60,000, which was subscribed locally. C. R. Christopher and C. G. Ryan organized the company and are at the head of its management.

Spokane, Wash.—The Co-operative Auto Sales Co., a $100,000 corporation which was recently organized by Spokane capitalists to carry on a wholesale and retail car and supply business on a co-operative plan, has purchased the entire issue of stock of the Regal Garage Co., also of Spokane, at its par value of $10,000.

Louisville, Ky.—The Louisville branch of the Goodrich and Diamond is now located at the southwest corner of Third avenue and Breckinridge street, in the building formerly occupied by the Leyman Motor Co. C. A. Breyley, who was manager of the local depot of the B. F. Goodrich Co., is manager of the Goodrich-Diamond Louisville office.

Boston, Mass.—A change was made last week in the handling of the Chevrolet and Little cars in Boston, which had been taken on by the F. J. Tyler Corporation a few weeks ago, as an agency proposition. The Republic Motor Car Co. has been organized as a Massachusetts corporation and it comprises the factory men who are to market the output as a factory branch, with headquarters in the Motor Mart, Park square. The F. J. Tyler Corporation has moved next door, where it will continue to handle the Columbus electric and later take on some other gasoline cars. W. C.

Sills, formerly assistant manager of the Buick Boston branch, has been placed in charge of the Republic company's branch.

Vancouver, B. C.—The Cole Auto Co., Ltd., factory distributor for the Cole, has opened its new home, 1285 Pender street West.

Baltimore, Md.—The Square Deal Auto Co., Flanders agent, is putting up a new garage and service station at 413 and 415 West Fayette street.

Seattle, Wash.—M. S. Bringham, the representative for the Cadillac line, has announced plans for a large three-story garage to be erected at 915 East Pike street.

Boston, Mass.—Walter Perham, who gave up the Cadillac agency last year, has taken it on again, making his headquarters for the present at the Sawyer Carriage Co.'s place on Worthen street.

Portland, Ore.—Another new Portland firm is the Moores Motor Car Co., which will handle the Stearns. The new firm will occupy quarters in the Bolton & McFarland building at Sixteenth and Alder streets.

Amherst, Mass.—Dr. Henry E. Page has organized a company with a capitalization of $12,000 to conduct a garage business on South Prospect street, and ground has been broken for a building that will accommodate forty cars.

Portland, Ore.—L. H. Rose, northwest district sales manager of the Flanders Motor Co., announces the placing of the Flanders six with the Oregon Motor Distributing Co. headed by Frank C. Riggs, as president. The territory of the new concern will consist of Oregon, the southern part of Washington and all of Idaho. A separate company to be known as the Multnomah Motor Car Co. has been organized to handle the Flanders output for the territory immediately surrounding Portland. C. S. Mantell will be sales manager of this company.

Seattle, Wash.—Salesroom, garage and machine shop for Garford trucks and motor cars will be erected at 1516 Broadway, Seattle.

Des Moines, Ia.—The Warren Motor Co. announces the opening of a factory branch in Des Moines. R. E. Gresham will be manager.

San Francisco, Cal.—William A. Baxter, of Dayton, O., has recently been appointed sales manager of the Pan-American Motors Co. of San Francisco.

Chicago—Max D. Bendel has supplanted Fred G. Bremer as manager of the Twitchell Gauge Co., whose offices have been moved from 1256 Michigan avenue to 1200 Michigan avenue.

Detroit, Mich.—C. H. Woodruff has become publicity manager of the Buick Motor Co., Flint, Mich. He formerly was connected with the Packard Motor Car Co. in a similar capacity.

Washington, D. C.—The Washington branch of the Foss-Hughes Co., agent for the Pierce-Arrow, has opened at 1220 Connecticut avenue, N. W., with F. N. Prendergast as manager. He will be assisted by R. S. Bartlett.

Philadelphia, Pa.—The Longstreth Motor Car Co., 257-259 North Broad street, local handler of the Alco line of pleasure cars and motor trucks, will remove to the company's new sales and service building, 2126-28-30 Market street.

Boston, Mass.—Norman Halliday, for the past year manager of the Boston branch of the E. R. Thomas Motor Car Co., has secured a position with the Alvin T. Fuller Co., of Boston, in charge of the truck department, and E. C. Locke, his assistant at the Thomas branch, has joined the sales force of the W. H. Stevens Co., handling the National.

Seattle, Wash.—Gray Brothers, agents for the Havers car in the state of Washington, have recently moved into new quarters at 1418 Broadway.

Buffalo, N. Y.—W. T. Butler has been appointed by the Stewart Motor Corporation manager for the district comprising northern Pennsylvania and New York state.

Tacoma, Wash.—Homer W. Bunker of Tacoma has severed his connection with the Oldsmobile company, and will in future act as representative in Tacoma for the Lozier.

Detroit, Mich.—O. R. Hardwell has shifted from the position of advertising manager of the Paige-Detroit Motor Car Co. to one of similar duties with the Grinnell Electric Car Co.

Merrill, Wis.—The Merrill Iron Works, operating a garage and shop as an adjunct to its iron, steel and machinery manufacturing business, has been purchased from John P. O'Day by H. B. Richmond, of Merrill, and George W. Schueppert, of Oshkosh, Wis.

Minneapolis, Minn.—The Owl garage, 2315 Hennepin avenue, has taken the northwestern agency for the Woods electric. The company, composed of Fred H. Day and Harry Murphy, has opened a new garage for electric service, with 25,000 square feet of floor space.

Lowell, Mass.—Arthur J. Cummiskey, who has been with the Moody Bridge Garage Co. for 2 years, has decided to go into business for himself and he has taken on the Cole, making his headquarters for the present at the Moody bridge garage on Pawtucket and Moody streets.

Recent Incorporations

Albany, N. Y.—Carbone Co., capital stock, $200,000; to deal in rubber tires, etc.; incorporators, W. E. Greene, G. C. Leonard, W. G. Van Loon.

Asbury Park, N. J.—National Automobile Owners' Association, capital stock, $25,000.

Augusta, Me.—Star Motor Car Co., capital stock, $1,000,000; incorporators, N. L. Goodell, W. M. Sanborn.

Boston, Mass.—United States Puncture Proof Tire Filler Co., capital stock, $50,000; incorporators, R. Magee, A. Wilson.

Boston, Mass.—Eldridge Mfg. Co., capital stock, $25,000; to manufacture motor cars, incorporators, W. E. Eldridge, H. B. Church.

Boston, Mass.—Newbury Auto Co., capital stock, $5,000; directors, E. L. Rowe, G. W. Mullett, P. J. Scanlon.

Buffalo, N. Y.—Frontier Garage & Livery Corporation, capital stock, $25,000; incorporators, F. L. Hoff, G. G. Meinell, G. P. Mitchell.

Chicago—Terminal Garage, capital stock, $10,000; incorporators, A. W. Little, L. Cohn, J. L. McCarthy.

Chicago—Motor Supplies Co., capital stock, $5,000, incorporators, H. C. Malbohm, P. W. Gillett, E. M. Beauchamp.

Chicopee, Mass.—Fisk Rubber Co., capital stock, $10,000,000.

Cleveland, O.—Lozier Sales Co., capital stock, $30,000; to deal in motor cars and accessories, incorporators, W. H. Miller, A. H. Weaver, W. B. Anderson, V. C. Erman, J. H. Brown.

Detroit, Mich.—Merrals Starter Co., capital stock, $150,000; to manufacture starters; incorporators, H. B. Lowland, R. S. Neely, W. Merralls.

Detroit, Mich.—Blad Sales Co., capital stock $10,000; to manufacture and deal in motor car accessories, incorporators, W. C. Chapman, R. P. Baubie, G. A. Breeze.

Detroit, Mich.—Sprung Carburetor & Clutch Co., capital stock, $45,000; to manufacture parts; incorporators, E. Sprung, W. Healy, J. S. Kennary.

East Orange, N. Y.—Funger Motor Trucking Co., capital stock, $100,000; incorporators, M. C. Funger, D. L. Horton, A. J. Greene.

Farmville, N. C.—Davis Motor Co., capital stock, $50,000; incorporators, J. Speight, J. R. Davis, F. R. Townsend, W. L. Joyner.

Hattiesburg, Miss.—Hattiesburg Automobile Co., capital stock, $10,000; incorporators, M. D. Fohey, H. S. Buscher, C. Ehlers.

Louisville, Ky.—Kentucky Automobile Co., capital stock, $65,000.

Louisville, Ky.—Southern Motors Co., capital stock, $100,000, incorporators, A. T. Hert, R. V. Lock, G. G. Botts, R. Whitehead, A. L. McCormick.

Memphis, Tenn.—P. R. Flanigan Auto Co., capital stock, $10,000; incorporators, P. R. Flanigan, J. J. Carrigan, T. M. Scruggs.

Mobile, Ala.—Seler Motor Co., capital stock, $3,000; incorporators, W. E. Brown, F. J. Sessler, N. R. Clarke.

Mt. Eaton, O.—Mt. Eaton Supply Co., capital stock, $60,000; incorporators, J. A. Yohn, F. B. Schlafly, C. L. Schaffer, R. Kenwell, A. Pfister, I. C. Wellbaum.

New York, N. Y.—A. M. A. Co., capital stock, $5,000; to deal in motors, etc.; incorporators, N. P. Myers, W. C. Allen, H. N. Allen.

New York, N. Y.—Globe Tire Co., capital stock, $500; to deal in tires; incorporators, R. W. Morrison, R. D. Placak, F. F. Nichols.

New York, N. Y.—Hallett Point Garage, capital stock, $5,000; incorporators, A. Kiss, Jr., T. D. Tompkins, G. Rees, Jr.

New York, N. Y.—Columbia Taxicab Co., capital stock, $5,000; incorporators, J. Graham, J. Pathe, P. Garrity.

New York—Millionaire Auto Co., capital stock, $2,000,000; to build motor cars, incorporators, H. M. Kilborn, S. McRoberts, J. A. Stillman, F. A. Vanderlip, A. W. Pritchett, P. A. Rockefeller, H. Hammond.

Newark, N. J.—Sults Mfg. Co., capital stock, $600,000; motor car business; incorporators, S. Sults, A. P. Bowne, H. J. Colway.

Newark, N. J.—Commercial Garage Co., capital stock, $10,000; incorporators, L. Kilpatrick, R. O'Gorman, S. A. Young.

Paducah, Ky.—Henry Brothers Taxicab Co., incorporators, F. Henry, T. Henry, E. E. Henry.

Pittsburgh, Pa.—Highland Motor Transfer Co., capital stock, $5,000; incorporators, J. Rommel, C. P. Schillinger, C. Gittermuth.

St. Louis, Mo.—Brashear Truck Co., capital stock, $5,000; general motor car transportation business; incorporators, J. R. Brashear, H. O. Rodes, L. S. Haslem.

St. Louis, Mo.—Elmhurst Motor Sales Co., capital stock, $10,000; incorporators, W. B. Kidder, H. H. Allyn, F. H. Bates.

Toronto, Ont.—Bulldog Tire Co., capital stock, $300,000; to manufacture tires, incorporators, W. J. Tubman.

Wilmington, Del.—Dayton Motor Truck Co., capital stock, $100,000; incorporators, E. E. McWhiney, N. P. Coffin, H. E. Latter.

Worcester, Mass.—Power Truck Sales Co., capital stock, $25,000; directors, E. Churchill, Jr., E. E. Delle, A. G. Dodge.

Pioneer

MOTOR AGE

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Contents

DEPARTMENTS

At 80 miles from Denver we passed through Como, once a thriving mining town with a division point on the railroad, but is now what is known as a busted town. At about 85 miles we went up quite a long winding grade, although not very steep, crossing a slight ridge. Coming down over the south side of this ridge we had our first ride on a convict road, the new road having just been completed during the summer of 1912.

Prairie Dogs Require Caution

At 90.2 miles we reached Fairplay, the largest town in South park and the county seat of Park county. There is a good small garage here, also hotel accommodations. At 101.3 miles the road branches, the left going direct to Hartsel for Colorado Springs, while the road keeping to the right along the foot of the range is for Buena Vista and the one we followed. At 107.4 miles we crossed the railroad at Platte River ranch with the Antero reservoir to the left. The road here in the south end of the park is very much like the plains road, practically no improvements having been made and vegetation scarce. The surface is good, however, although caution should be used for prairie dog holes.

At 110 miles we passed what is known as the old Salt Works, and just beyond commenced a gradual rise out of the park to the top of Trout Creek pass, 114.0 miles. The road has been very much improved and we were at the top of the pass almost before we realized it, an altitude of about 9,500 feet. The ride down off the pass, particularly after passing Newett, 117.7 miles, brought forth one continual round of exclamations from everyone in the party. The road, although very winding, with sharp turns on 10 to 12 per cent grades in spots, is almost like a boulevard. If time had permitted we should like to have visited the Castle Rocks, which are passed just below Newett. Although there are a number of similar formations in the state these are about as striking as any we saw. The ride is down Trout Creek canyon, the grade being located on the north side. Just after coming along Castle Rocks we had our first real view of the continental divide across the Arkansas valley, with Mt. Princeton almost straight ahead. This peak, with Mt. Yale and Mt. Harvard to the north, are sometimes called the Collegiate range, although they are really part of the Saguache range. This range is parallel to the Park range and on the west side of the Arkansas river. It is the central part of the continental divide and has the highest peaks of the Rockies, the Collegiate group all being over 14,000 feet high.

The descent from Trout creek is over 7 miles long, the real foot of the pass being reached at 127.5 miles. The road to the left here is almost straight south down the Arkansas 23 miles to Salida. We turned north up the river directly into Buena Vista, 130 miles from Denver, altitude 7,960 feet. This is about what the ordinary tourist, following the route we did, will cover in a day's ride, therefore we changed our mileage at this point back to zero and [illegible] luncheon started out for Leadville.

Watch Snowstorm in Shirt Sleeves

The weather was ideal in every way, being so warm that if we had not been driving in the car we could have gone around very comfortably without our coats and at the same time we had our first experience of watching a snowstorm on the peaks above us. In a few places the storm was so close that snowflakes actually reached us. The road north up the Arkansas was a gradual ascent all the way on good road. It is practically a gorge road

Little Chance of a French Grand Prix Road Race in 1913

Only Sixteen Nominations Received When Entries Close, Minimum of Forty Being Required—Now Europe is Interested in L'Auto's Proposed 183-Inch Contest

PARIS, Nov. 1—At the moment the entry lists for the French grand prix were closed with a total of sixteen out of the minimum of forty cars required—thus probably entailing the abandonment of the race—the rules were made public for the Coupe de l'Auto, or 3-liter race to be managed by L'Auto. In all probability this will be the only race of the year, for L'Auto is opposed to allowing the big cars to join in with the 3-liters as was done at Dieppe this year, and the national club cannot hold its race independently with only sixteen cars.

There is a possibility that the club having failed to get the required number of entries for its own event, may ask to be allowed to join L'Auto in the organization of the 3-liter event, thus giving an official character if not adding to the importance of this race.

It is now certain that the 3-liter race to be held on Sunday, June 29, over a course yet to be selected, will be the most important European speed contest of the 1913 season. Races have been run under these rules in 1911 and 1912, and next season will see their last application, the organizers being of the opinion that full advantage will have been got out of them after 3 successive years' experience.

Though the same in principle, there are a number of important detail changes in the regulations. Feeding the cylinders by any mixture at more than atmospheric pressure is forbidden. Last year Hispano-Suiza built a set of cars with a couple of additional cylinders acting as compressors of the explosive charge. These cars were not entered for the race, but it was feared that similar attempts might be made to pump a charge into the cylinders and thus falsify the results of the race.

The new rule says that at the moment of introduction to the cylinders the mixture must not be at higher than atmospheric pressure at 760 mm. of mercury.

It is no longer necessary that the driver and mechanic should sit side by side. The latter may be behind the former, and probably will be in most cases, with a substantial decrease of head resistance. It is argued that stream line forms are to the final benefit of the car owner and should be encouraged and not discouraged in all races. A return has been made to the conditions prevailing prior to 1906 by allowing work to be done on the cars by attendants and authorizing the establishment of depots at any point around the course. It is the experience of the late David Bruce-Brown and the Peugeot driver Goux, both disqualified for taking gasoline on the course at Dieppe that has led the organizers to make this change. So far as tires are concerned the difference will not be enormous, for with the general use of detachable wheels big tire-changing staffs are not required.

Instead of a minimum chassis weight of 1,763 pounds, a maximum of 1,984 pounds has been imposed. It is believed that in the last two races manufacturers did not sufficiently study the problem of weight reduction, for while there were a few cars which held to the road perfectly although remaining very close to the minimum mark of 1,763 pounds, many of them were built up to nearly 2,000 pounds under the belief that lower-weight cars would not stick to the road. The weight is taken without water, gasoline, oil, spares, tools, etc. The two men must scale 308 pounds, any deficit being made up by ballast. Entries for the race close on December 31, and at double fees on March 31. For a single car the ordinary fee is $200; for two cars, $360; for three cars, $500, and for a full team of four cars, $600. The place of the race has not yet been decided.

The sixteen cars which sent in their engagement for the grand prix of the Automobile Club of France represent the firms Sunbeam, Peugeot, Delage, Mathis, Itala with valveless type, Opel, and Schneider. The sporting committee of the A. C. F. will meet in a few days to decide what shall be done. There appear to be but two courses: either abandon the race altogether or allow entries to be received at ordinary fees until January 1. Probably the former course will be preferred, for the manufacturers object to being kept in doubt as to the holding of the race until

part of the way, with steep cliffs on either side. After getting about 12 miles out the road becomes very winding with sharp turns on upgrades. At about this point we were met by an escort of three cars from Leadville which went ahead to pilot us. At 16 miles we crossed the Arkansas and immediately came onto a cliff road literally cut out of the rock about 600 feet almost straight above the river. It was our first experience on what we later came to call eyelash roads. The experience of riding along such roads can hardly be described. As a thriller it is best illustrated when one realizes that whoever is in the outside of the tonneau seat gets the impression that he is riding along on nothing, as about all he can see on looking over the side of the car is space. The surface was excellent with frequent turnouts, but turns are sharp and numerous. However, there is less than 2 miles of this, and we reached Granite at 17.7 miles.

Along Shore of Twin Lakes

From here to Leadville there are two roads—the shorter known as the river road—but although it is just as good, we decided to follow the longer route via Twin Lakes in order to take in this scenic spot. The first view of the lakes was to be had about 4 miles from Granite and the road follows along close to the shore all the way past the hotel to the head of the upper lake. It is almost impossible to adequately describe the beautiful location of these lakes. They are literally at the foot of the continental divide, with Mt. Elbert on the north and Twin Peaks on the south rising almost straight up from the shores of the lake. The former peak has an altitude of 14,421 feet, only 3 feet less than Mt. Massive, the highest peak in the Rockies, which is located just to the north of Mt. Elbert. Although the view from the shore of the lakes is wonderful, a complete realization of this beautiful spot was much more fully appreciated when we had reached the top of the hill above the lakes.

All the way up the winding grade the view out over the valley opened up more and more, but on reaching the top of the climb we had the most impressive view. Leaving the car and stepping over to the edge of the bluff we got our first full view of both lakes 500 feet below, with the majestic snow caps towering above. Although practically nothing has been written about this spot, it is worthy to be ranked with the best in the state.

Coming down off the hill the road swings to the east along the Arkansas and straight north to Malta Junction, 38.4 miles, where we turned right, passing the enormous smelter of the American Smelting Co., and reaching the hotel in Leadville by 6 p. m.

Typical Mining Town

Leadville, 42 miles from Buena Vista, has an altitude of 10,185 feet. This is a typical mining town and probably one of the best known the world over, as it has produced in lead, zinc, copper, gold and silver 400 million dollars. Tourists will do well to stop at least half a day here to visit some of the smelters, properly seeing mining operations. It is also the natural point to start out on the ascent of Mt. Massive, which can be made in 1 day.

We were well taken care of by the Leadville people and our one regret was lack of time to accept their invitation to stay over and see the actual mining and smelting operations. In the evening a sort of impromptu good roads meeting was held with a few of the prominent business men, and we found them, like the majority of people all along our route, alive to the importance of good roads and actually doing things in the construction of improved highways.

(To be continued)

Western Farmers Put Stamp of Approval on Motor Cars

such a late date as January. The charge is made in certain quarters that the club is not at all enthusiastic over its own race, or it would have announced the event as certain whatever the number of cars received and fixed the closing of the lists after the European motor shows. From private sources it is learned that the French firms Peugeot, Delage and Schneider, as well as the English Sunbeam, will transfer their grand prix entry to the 3-liter or 183 cubic inches race.

EXPORTS AND IMPORTS

Washington, D. C., Nov. 12—Government statistics made public today show that 1,590 motor cars valued at $1,438,528 were exported in September, as against 1,159 cars valued at $1,121,514 during the same month of 1911.

The exports for the 9 months ending September, 1912, amounted to 18,406 cars, valued at $18,252,299, as against 11,244 cars, valued at $11,565,034, during the same period of 1911.

The exports by countries were: France, $45,538; Germany, $26,022; Italy, $23,519; United Kingdom, $104,080; other Europe, $73,620; Canada, $473,465; Mexico, $71,564; West Indies and Bermuda, $19,750; South America, $153,919; British Oceania, $194,471; Asia and other Oceania, $155,676; other countries, $96,904.

Eighty-three motor cars were imported in September, 1912, valued at $165,646, as against sixty-two cars, valued at $137,253, imported during September a year ago.

North Dakota Better Farming Association Decides to Equip Field Men with Power Machines for Purpose of Carrying Its Representatives on an Educational Campaign

FARGO, N. D., Nov. 11—Motor cars hereafter will be used exclusively by the North Dakota Better Farming Association to carry education in scientific farming methods direct to the farmer on his land. An exhaustive test extending over 2 years has just been completed by Secretary Thomas Cooper who announces the adoption of the motor car by the association.

As a result the field men of the association stationed in nearly every county of the state will be provided with motor cars and will use them in visiting the farmers at home and carrying to them the latest discoveries in agricultural science. The North Dakota Better Farming Association under the direction of Secretary Cooper is the first organization to adopt the plan of carrying agricultural education to the farmer at work in his fields and the motor car has been selected as the best medium for the transmission of the scientific knowledge.

For 2 years the association has carried on experimentation to determine the relative cost of horses, motor cycles and motor cars with the result that the car proved itself capable of doing more work at a smaller comparative cost of upkeep than either of the other means of transportation.

The field agents of the association stationed in more than twenty counties of North Dakota work in co-operation with the men on the farms to secure better agricultural results in the state. Their work calls for a vast amount of traveling as they are called upon to cover their entire territory weekly.

During the last season one car traveled a total of 5,280 miles at an upkeep cost of $1.75. With depreciation added the cost per mile was slightly less than 4.5 cents. In several other counties records nearly as good were made. In two counties motor cycles showed a smaller cost per mile but the user was unable to cover the same amount of territory that could be covered by motor car. Motor cycles probably will be used for another year in one or two of the newer counties.

In the counties where horses were used for covering the territory it was found that the distance covered was smaller while the cost of upkeep was in some cases double the cost of motor car upkeep.

ENGLISH TO HAVE ROAD RACE

London, Nov. 2—It is authoritatively stated that the Royal Automobile Club is planning to run a road race on the Isle of Man next year. Details have not yet been announced, but it is anticipated that no difficulty will be experienced in getting permission to use the roads for racing purposes.

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Colorado and Its Wonders

MOTOR AGE begins in this week's issue the first of a series of articles descriptive and illustrative of a 1,000-mile tour through Colorado in the heart of the mountain section, a tour made with the object of photographing the scenic attractions of the Rocky mountains in the state, and also to discover the suitability of the roads for motor touring.

THE photographic reproductions speak for themselves; and so far as the roads are concerned it can be said to the credit of Colorado that only one stream had to be forded in this entire distance, and that only once was a tow necessary, and that for a short distance.

THE tour has demonstrated that Colorado is the Eden of America so far as possible touring of-to-day is concerned. The roads instead of being unknown trails, as many had imagined they were, are better on the 1,000 miles covered in this trip than the touring roads of the Adirondack mountains. This should be pleasant news to the tourist, who never has witnessed the marvels of the mountains which form the backbone of the continent, solely because he has imagined it was impossible to see them from the motor car. He has imagined that traveling through a pass at an altitude of over 10,000 feet was an impossibility, but it is not. If cars can traverse such passes without the slightest difficulty in the middle of October, there is no reason why such a trip in the earlier months would not be as pleasant and easily made as a tour through the Berkshires at the same period.

THE mountainous grades which so many have heard vaguely about are largely hallucinations, and in the course of a few years, when the present extensive road system has been more completed, it will be possible to cross the mountains in the majority of the Colorado passes without encountering a grade exceeding 15 per cent. It is true that at present the roads are narrow in places, but there are the necessary turn-outs so that passing vehicles traveling in the opposite direction or overtaking slower moving vehicles traveling in the same direction is not so difficult as imagined. With the roads of Colorado to-day it does not call for a professional chauffeur or an expert mechanician; rather the amateur, who is competent to drive his car on the country roads of the east, center or west is adequately qualified to take his machine with his friends or family on a 1,000-mile jaunt through the most majestic scenery of the Rocky mountains and Colorado.

FOR the eastern tourist there is but one obstacle at the present time, namely, the apparently excessive freight charges between Chicago and Denver, which are several times that for an equal distance east of the Illinois metropolis. Many who want to spend 2 weeks in this playground of America do not care to tour there and back, and it is imperative that the motorist and business interests of the Rocky mountain states get together and procure the lowest possible freight rates from Chicago to Denver. Such action will help touring in those sections; it will be but one of the logical steps in bringing this grand heritage of America within the reach of tens of thousands of the population.

The Stone Road Project

FOR reasons unknown to the public at the present time the motor car manufacturers have not taken up with expected avidity the project of securing a stone highway from the Atlantic to the Pacific by the summer of 1915 and purchasing the materials for such a highway by a fund raised among the motor car and accessory manufacturers. The Indiana makers set the ball rolling with unbounded enthusiasm, and one of the tire companies came forward voluntarily with a liberal offering, the total aggregating more than a million, all being accomplished in a few weeks time, and it seemed that the necessary fund to purchase the material would be ready by January, 1913. With the raising of the first million a cessation came. No public explanation has been made as to why, but it has generally been attributed to a difference of opinion amongst makers in manufacturing centers. Undoubtedly some have been for other means of road-building, federal aid, or other measures.

IT is to be regretted that the movement is apparently in a slump because with the rank and file of the American citizenship the demands for such an improved highway are greater to-day than they were 6 weeks ago. It is only dawning upon the American citizen the losses he is suffering annually because of unimproved roads. Not one motorist in 10,000 sits down and sanely estimates the increased cost of running his car 5,000 miles per season because of the poor highways. He fails to take into consideration the wear and tear on his machine because of the road surface; he fails to calculate the excessive tire wear due to the sharp boulder in the road surface which he strikes in an unguarded moment, and probably inflicts a bruise on a tire, resulting in a premature blow-out; and he fails to calculate the additional outlay in gasoline.

BUT the expenditures enumerated are only those applying to the machine: There is the humanitarian side. While there is wear and tear on the car there is worse wear and tear on the passengers. When a portion of a car breaks or is damaged there is a stated repair bill, but not so when personal injury results. Not a motorist but realizes the injury of driving all day in a dust-laden atmosphere, with germs everywhere. Contrast this with a smooth, well-oiled road surface in which the motorist enjoys the healthful air as it was deemed he should. These are the great reasons why America needs road improvement.

THE strong argument of a stone highway from ocean to ocean is that it makes it possible for the motorist of the present generation to see his own land. True, the many transcontinental railroad lines which have done noble pioneering work in this respect and offer reasonable facilities for sight seeing, but the possibilities of knowing the land and meeting the people are not to be compared with those afforded by the motor car.

More Than a Million in Fisher Fund

Many Concerns Contribute to Big Highway Scheme

INDIANAPOLIS, Ind., Nov. 11—Carl G. Fisher and J. A. Allison, at the head of the movement to raise a fund of $10,000 for material for a road from coast to coast, announce that in 30 days more than $1,000,000 has been contributed, of which amount Indianapolis has promised $310,000. The movement is spreading rapidly and help is promised from many sources. The following companies and individuals have pledged their 1 per cent contributions, payable either one-third of 1 per cent for 3 years, or 1 per cent for 1 year of their total gross sales:

CAR MANUFACTURERS

Prest-O-Lite Co., Prest-O-Lite gas tanks, Indianapolis	$60,000
Wheeler & Schebler Co., Schebler carbureters, Indianapolis	50,000
Ideal Motor Car Co., Stutz cars, Indianapolis	⅓ of 1% for 3 years
Premier Motor Mfg. Co., Premier cars, Indianapolis	⅓ of 1% for 3 years
Waverley Co., Waverley electrics, Indianapolis	⅓ of 1% for 3 years
American Motors Co., American cars, Indianapolis	⅓ of 1% for 3 years
Henderson Motor Car Co., Henderson cars, Indianap's	⅓ of 1% for 3 years
Motor Car Mfg. Co., Pathfinder cars, Indianapolis	⅓ of 1% for 3 years
Pumpelly Battery Co., electric batteries, Indianapolis	⅓ of 1% for 3 years
Christian Off & Co., fenders and specialties, Ind'nap's	⅓ of 1% for 3 years
Gates Mfg. Co., tops, etc., Indianapolis	⅓ of 1% for 3 years
R. J. Irwin Mfg. Co., tops, bodies, etc., Indianapolis	⅓ of 1% for 3 years
Glover Equipment Co., tops, etc., Indianapolis	⅓ of 1% for 3 years
Goodyear Tire & Rubber Co., Akron, Ohio	$300,000

INDIANAPOLIS DEALERS

Gibson Automobile Co., Overland state agents	⅓ of 1% for 3 years
Empire Tire Co.	⅓ of 1% for 3 years
Gus Habich Co, motor cycles	⅓ of 1% for 3 years
G. H. Westing, motor cycles	⅓ of 1% for 3 years
Cadillac Auto Co. of Indiana, Cadillac state agent	⅓ of 1% for 3 years
Archey Atkins Co., Pierce and Hudson state agent	⅓ of 1% for 3 years
Oakland Motor Co., Indianapolis branch	⅓ of 1% for 3 years
Morton Place Automobile Co.	⅓ of 1% for 3 years
Mutual Printing and Lithographing Co.	⅓ of 1% for 3 years

CLUB

Hoosier Motor Club, Indianapolis, 400 club buttons at $5	$2,000

OUTSIDE OF INDIANAPOLIS

Brown Commercial Car Co., Peru, Ind.	⅓ of 1% for 3 years
Remy Electric Co., Anderson, Ind.	$50,000
Esterline Mfg. Co., Lafayette, Ind.	⅓ of 1% for 3 years
Fellwock Auto and Mfg. Co., Evansville, Ind.	⅓ of 1% for 3 years
Moore Motor Truck Co., Waterville, O.	⅓ of 1% for 3 years
American F. U. Co., Newtonville, Mass.	⅓ of 1% for 3 years
Doehler Die Casting Co., Brooklyn, N. Y.	$5,000
Federal Pressed Steel Co., Milwaukee, Wis.	$2,000
Dorris Motor Car Co., St. Louis, Mo.	⅓ of 1% for 3 years
Edwards Motor Car Co., New York	⅓ of 1% for 3 years
Dispatch Motor Car Co., Minneapolis, Minn.	⅓ of 1% for 3 years
Lunkenheimer Co., Cincinnati, O.	$1,500
Wheeling Corrugating Co., Wheeling, W. Va.	$100
Thomas A. Phillips Motor Car Co., Dayton, O.	⅓ of 1% for 3 years
St. Joseph Auto and Supply Co., St. Joseph, Mo.	⅓ of 1% for 3 years
Tom Botterill, Denver, Colo.	⅓ of 1% for 3 years
Nelson & LeMoon, Chicago	⅓ of 1% for 3 years
Enterprise Garage Co., Columbus, O.	⅓ of 1% for 3 years
Pound & Miller, South Chicago	⅓ of 1% for 3 years
Central Motor Car Co., Canton, O.	⅓ of 1% for 3 years
R. W. Tansill, Chicago	⅓ of 1% for 3 years
George M. Miller, Boston, Mass.	⅓ of 1% for 3 years
W. N. Pungs, Detroit, Mich.	⅓ of 1% for 3 years
Phoenix Motor Car Co., Lexington, Ky.	⅓ of 1% for 3 years
Overland Co., Grand Rapids, Mich.	⅓ of 1% for 3 years
H. C. Whitaker, Wheeling, W. Va.	⅓ of 1% for 3 years
A. H. Wells Co., Waterbury, Conn.	⅓ of 1% for 3 years
Newstadt Automobile Supply Co., St. Louis, Mo.	⅓ of 1% for 3 years
Henry White, Stapleton, N. Y.	⅓ of 1% for 3 years
W. A. Shanahan Co., New York	⅓ of 1% for 3 years
American Auto Supply Co., New York	⅓ of 1% for 3 years
Lehardy & Lindsay, Rochester, N. Y.	⅓ of 1% for 3 years
Michael Murphy, Cambridge, Mass.	⅓ of 1% for 3 years
Leonard's garage, Auburn, N. Y.	⅓ of 1% for 3 years
James N. Boyce, New Haven, Conn.	⅓ of 1% for 3 years
Walter Scott, Baltimore, Md.	⅓ of 1% for 3 years
Budd M. Robinson, Joplin, Mo.	⅓ of 1% for 3 years
Drysdale garage, Decatur, Ill.	⅓ of 1% for 3 years
Forbes Motor Car Co., Pittsburgh, Pa.	⅓ of 1% for 3 years
Sixth Street Garage, Los Angeles, Cal.	⅓ of 1% for 3 years
B. W. Twyman, Columbus, O.	⅓ of 1% for 3 years
M. Kirchberger & Co., New York	⅓ of 1% for 3 years
Avery Stamping Co., Cleveland, O.	⅓ of 1% for 3 years
American Brass and Iron Co., Detroit, Mich.	⅓ of 1% for 3 years
Hamilton Square garage, San Francisco	⅓ of 1% for 3 years
Winton Motor Sales Co., San Diego, Cal.	⅓ of 1% for 3 years
F. P. Choate, agent Kissell Motor Co., Chicago	⅓ of 1% for 3 years
Southern Garage, Pittsburgh, Pa.	⅓ of 1% for 3 years
Haicken Elberg Mfg. Co., Kansas City, Mo.	⅓ of 1% for 3 years
J. D. Sourwine, Brazil, Ind.	⅓ of 1% for 3 years
Southern Motor Car Co., Jacksonville, Fla.	⅓ of 1% for 3 years
W. W. Carpenter, New Franklin, Mo.	⅓ of 1% for 3 years
Pressed Steel Tank Co., Milwaukee	⅓ of 1% for 3 years
Smith-Everett Auto Co., Portland, Ore.	⅓ of 1% for 3 years
John B. Quinn, Fall River, Mass.	⅓ of 1% for 3 years
E. C. Burke, Seattle, Wash.	⅓ of 1% for 3 years
Bert Farrar, Seattle, Wash.	⅓ of 1% for 3 years

Coming Motor Events

November 23-24—Track meet, Fresno, Cal.
November 28-29—Track meet, Richmond Automobile Club, Richmond, Va.
December 2-3—Annual meeting American Automobile Association, Chicago.

SHOWS

November 8-16—Olympic.
November 13-15—N. A. A. M. meeting, Detroit.
November 16-23—Atlanta, Ga.
November 26-30—Show at Grand Rapids, Mich.
December 7-22—Paris salon.
January 4-11, 1913—Cleveland.
January 4-11—Montreal.
January 11-18—New York pleasure car show; Automobile Board of Trade; Madison Square Garden and Grand Central Palace.
January 11-22—Brussels, Belgium.
January 20-25—New York truck show; Automobile Board of Trade; Grand Central Palace and Madison Square Garden.
January 20-25—Philadelphia.
January 25-February 1—St. Johns, N. B.
January 25-February 1—Montreal, Canada.
January 27-February 1—Scranton, Pa.
January 27-February 1—Detroit.
February 1-8—Chicago.
February 10-15—Chicago truck show.
February 10-15—Minneapolis.
February 11-15—Ottawa, N. Y.
February 15-22—Newark, N. J.
February 16-23—Richmond, Va.
February 17-22—Kansas City.
February 24-March 1—St. Louis, Mo.
February 24-March 1—Memphis, Tenn.
February 24-March 1—Cincinnati, O.
February 24-March 1—Omaha, Neb.
March 3-8—Pittsburgh.
March 8-15—Boston pleasure car show.
March 17-22—Buffalo.
March 19-26—Boston truck show.
March 24-29—Indianapolis.

The Chauffeur's Calling

WHAT is perhaps the best estimate of the motor car operator's calling is found on the wall at one of the Boston motor schools, and it is well worth being read by all chauffeurs. It is as follows:

"The chauffeur sustains a peculiar relation to his employer. He is not a servant on the one hand, nor a companion on the other. He is supposed to be a skilled, well trained, competent, good-tempered, respectful employee, who not only knows his business, but his place, and knows how to fill the unexpected problem. All of these points, mechanical, social and economic, are presented in the well conducted motor car school and as a result the chauffeur knows his profession and is alert to the responsibilities and requirements and is prepared to meet them. He sustains the same relationship to the motor industry that the marine engineering department of the United States navy does to our entire naval establishment.

"These engineers are graduates of the Naval Academy at Annapolis and are cultured, refined gentlemen; yet they put on overalls and stand watch in a hot engine room below decks, surrounded by engines of all descriptions, with a complete knowledge of every rod, bolt and shaft of the entire vessel. These men do not apologize for their grimy hands, but, instead of being classed as ordinary mechanics, they have raised the whole standard of marine engineering to the gentleman's level, and have shown that the skilled operator of expensive and delicate machinery is quite on a par with his cleaner, though no more honorable, fellow officer of the quarter deck.

"The chauffeur should thus regard his profession and seek to be an indispensable adjunct to every refined American home which can afford the luxury of a motor car; or if in commercial lines he should strive to make himself a thorough master of the requirements and economic conditions of the industry, and be an important factor in it."

Flanders–United Motors Deal Certain

Decision of Judge Hough in New York Denying Petition for Intervention in Reorganization Plans Followed by Confirmation of Merger Rumors—Going to Detroit

DETROIT, Mich., Nov. 12—Confirmation of the reported merger of the Flanders Motor Co., of this city, and the United States Motor Co. was given out last night following the decision of Judge Hough of the United States district court in New York, in which he denied the petition of some of the stockholders of the United States Motor Co. for intervention in its reorganization plans.

Walter E. Flanders will head the enlarged corporation, and the headquarters of all the plants except that of the Stoddard-Dayton at Dayton, O., will be moved to this city, it is declared.

The plans as now formulated contemplate the purchase of the Flanders Motor Co. for $3,750,000, of which $1,000,000 will be paid in cash and the remainder in stock. It is stated that while W. E. Metzger and B. F. Everitt withdraw from active participation under the new basis, they still retain stock interests.

The bringing of the executive offices of the various United States Motors, subsidiaries to Detroit means much to the city. The Sampson and Brush plants probably will be reopened, giving employment to some 500 additional workmen, while it will also mean the location of various manufacturers of parts here, so that in the end some 10,000 new workers will be added to the already great army of industrial operators now engaged in the many motor lines in this city.

Officers of the Flanders organization could not be reached today, so it is impossible to get at details of the transaction other than those given above.

United Motors Auction Ordered

New York, Nov. 11—What in effect is an auction sale has been ordered by Judge Charles M. Hough with regard to the assets of the United States Motor Co. Of course, there will be no "Going, Going—Gone" feature such as mark regular auction sales, but in the essential particulars the disposition of the property will be by an auction sale.

Next Monday the court has signified its intention to sign a final decree of sale, and while the time for its consummation has not yet been fixed, it is certain it will take place some time in January.

Under the form of order prepared today in the United States district court the bidders will have the opportunity to bid on the assets divided into six parcels, or on the whole as a single lot. A certain qualifying amount of cash or certified check will be required from each bidder and the deposits together with the formal bids may be placed in the custody of the court between the hours of 11 o'clock in the morning and 3 o'clock in the afternoon of the day fixed for the sale.

The auction feature arises from the fact that bidders will be allowed, under the tentative form of the final order, to increase their offerings at any time prior to the hour set for the closing of the sale. The division of the assets will be along these lines:

Parcel No. 1 shall consist of all the property of the United States Motor Co. Parcel No. 2, all the property of the Alden-Sampson Mfg. Co.; No. 3, Brush Runabout Co.; No. 4, Columbia Motor Car Co.; No. 5, Dayton Motor Car Co., and No. 6, Maxwell-Briscoe Motor Co. The parcels will be offered in the order of their numbering. Immediately after the bids have been concluded for the various parcels the whole property will be offered as an entirety.

There was little comfort in the proceedings for the elements that have made objection to the immediate settlement of the company's affairs. They were on hand in court, but the rulings from the bench were against them. The three-headed demurrer which was informally filed on behalf of certain stockholders was dismissed. The demurrer alleged that the court had no jurisdiction; that insufficient facts were set out in the bill of complaint and took up other technical grounds. Judge Hough held adversely to the demurrer on the ground that the court did have jurisdiction; that sufficient facts were stated in the bill and that the affirmative action of the officers of the various defendant concerns bound the stockholders in the absence of allegations of fraud.

It was stated by one of the objecting attorneys that the court ought to name a referee to investigate the alleged shrinkage of assets between the time of the last annual report, when it was shown that they footed up to over $23,000,000, while at the time the receivers completed their work there was a nominal loss of over $12,000,000.

It was explained that the apparent shrinkage was due to the elimination of all items not directly representing some tangible assets from the report of the receivers, and further that the last annual report of the company represented the assets in the light of the seller, while that of the receiver looked at the case from the buyer's point of view.

Mr. Curtis, representing a large amount of preferred stock, said that the creditors who were represented to the extent of $10,000,000 of claims by Joline, Larkin & Rathbone were the only parties in position to bid on the assets when it came time for the legal sale. This, he explained, was due to the fact that they could put in their claims with the bids submitted, while all others would have to bid actual cash. Thus the situation resolved itself into a contest between paper and cash, with all the advantage on the side of the paper.

A suggestion was made by James N. Rosenberg that an offer had been submitted to lease the Brush and Sampson plants in Detroit during the receivership. He said that if such a lease could be consummated it might help the whole property at the sale.

At the session it was not stated who the prospective tenant might be, but after adjournment it was announced that it might be the Flanders Motor Car Co., although the definite statement was not made. It was stated that the Flanders company required extensive manufacturing facilities and that as both the Brush and Sampson plants were practically closed down, the deal would be an excellent one from every point of view. The court gave assent to leasing the plants, but limited the term to the receivership.

Mr. Rathbone, of Joline, Larkin & Rathbone, said that the merger between the United States Motor Co. and the Flanders Motor Car Co. had been tentatively arranged on the best possible terms and that Walter Flanders would be the next president of the United States Motor Co. in all probability. He said that it would be impossible to make a more definite statement pending the action of the court. The proposed contract must be ratified by both sides, but it is said that it has been prepared in final form. Mr. Rathbone said that the Flanders company would be taken over free from all but its current indebtednesses, dealers' deposits and current accounts.

Fully 91 per cent of the claims against the United States Motor Co. have been deposited under the plan of reorganization and a considerable fraction of the remainder, consisting of about $1,000,000, would be deposited within a week.

The stock deposits are coming in at a slower rate. About $4,000,000 par value of both issues have been turned in, but the amount so deposited is of relatively small importance to the re-establishment of the company.

Farewell Banquet for Briscoe

Benjamin Briscoe, retiring president of the United States Motor Co., was the guest of honor at a banquet given by officers and employees of the United States Motor Co. in the Hotel Astor last Thursday night. The well wishes of the employes was manifested by the gift of a Tiffany watch and fob from the men and a large basket of chrysanthemums from the young women of the company.

Tire Tread Patent Decision Reversed

United States Circuit Court of Appeals Decides Against Hartford Rubber Works in Case Involving Midgely and Adams Claims—Injunction Decreed Against the Defendant

NEW YORK, Nov. 11—Overturning the judgment of the United States district court, district of Connecticut, the United States circuit court of appeals has reversed the findings of Judge Platt in the suit of the Metallic Rubber Tire Co. against the Hartford Rubber Works, involving the Adams and Midgely treads. In the lower court Judge Platt dismissed the bill and found in favor of the Hartford company. The upper court sustains the Adams patent, decrees an injunction against the Hartford company and orders an accounting as between the parties and gives a decree for costs against the defendant.

The suit was instituted by the Metallic Rubber Tire Co., alleging that the Hartford company infringed its patent rights under the Adams patent. The Hartford company responded by setting up defenses of invalidity, non-infringement, abandonment and want of equity and Judge Platt found for the defense, dismissing the bill in the first instance.

Appeal was taken by the complainant to the circuit court of appeals and the full bench, consisting of Judges Lacomber, Coxe and Noyes, heard the arguments, which were presented by Alfred Wilkinson for the complainant and E. W. Vaill for the defense. Judge Noyes wrote the opinion, the more pertinent parts of which are as follows:

Concededly the nearest approach to the patent in question is the Phillips English patent, and the question of anticipation may well be determined by examining that patent and comparing it with the one in suit.

The principal object of the Phillips patent was to protect and strengthen pneumatic tires. It illustrates numerous ways for stiffening and protecting tires, and among others, points out that the tread or wearing portion may be reinforced or strengthened by stitching the rubber with metal wire, threads, cord and the like. Some of the drawings of the patent are very similar to those of the patent in suit. The prevention of slipping, however, is not stated to be either an object of the Phillips patent nor a result of the use of its structure. Moreover, it is not clear that the non-skidding effect would be obtained by following the teachings and drawings of the Phillips patent.

Wire sewed into a tire to reinforce the rubber naturally would be flexible wire, while only stiff wire would furnish the hard bearings required to prevent slipping, especially after the wearing off of the loops. The Phillips patent shows that rubber tires may be stiffened and protected by wire stitching but, in our opinion, does not teach that exposed wire stitchings will make hard bearings to prevent skidding. Indeed, many things in the Phillips patent point in the direction of covering the wires and it is never essential that the stitches should be flush with the surface of the tread.

The court then dismisses the objection raised as to the validity of the Adams patent by commenting on the fact that the Hartford company has had a license to manufacture under a patent and upon the expiration of the license has put out a product which, even if not infringing, closely simulates the patented structure. In conclusion Judge Noyes says.

In our opinion the defendant's structure infringes. The claim covers the combination of the wire and rubber as a result and we think that the defendant should not be permitted to escape the charge of infringement by combining its wire and rubber in a different way from the stitching or weaving illustrated in the specification.

The decree of the district court is reversed with costs and cause is remanded with instructions to enter a decree for the complainant for an injunction, an accounting and costs.

R. C. H. RE-OFFICERED

Detroit, Mich., Nov. 11—At a meeting of the directors of the R-C-H Corporation last Friday J. F. Hartz, president of the J. F. Hartz Co. and officer and director of various other leading Detroit business concerns, was chosen general manager and treasurer of the corporation. Other officers for the coming year are: President, R. C. Hupp; vice-president, C. P. Sieder; secretary, L. G. Hupp; assistant general manager, F. R. Hupp.

The directors are G. W. Rogers and J. G. Robertson, of Akron; C. G. McCutchin, of Jackson, Mich.; J. F. Hartz, John Kelsey, C. P. Sieder, F. M. Randall, J. H. Clarke and R. C. Hupp, of Detroit. The active management rests with an executive committee of five, composed of Messrs. Hartz, Kelsey, Randall and R. C. Hupp, of Detroit.

MOTOR MEETINGS SCHEDULED

New York, Nov. 12—The annual meeting of the American Automobile Association has been scheduled for December 2-3 at Chicago. The banquet, which is always a feature of the meeting, will be held at the Auditorium on the evening of December 2. It is expected that the attendance will be very large at the sessions and banquet.

The regular monthly meeting of council of the Society of Automobile Engineers is scheduled for tomorrow.

CHICAGO TRADE CHANGES

Chicago, Nov. 11—There have been several changes on the row of late. A. M. Cobb, formerly manager of the Thomas branch, has succeeded to the position of manager of the Velie branch left vacant by the retirement of Morton H. Luce, who goes to New York representing the Marion and American. George L. Sullivan of New York has been appointed manager of the local Alco branch in place of B. C. Day. R. S. Mattoon, who has conducted an agency for several years, will retire from the motor car business, it is said. Also Charles M. Hayes has severed his connections with the Halladay people.

Thomas J. Hay, formerly manager of the Ford branch, has decided to become a dealer and expects to open up in the spring with a line of cars.

FORD AMENDS PATENT SUIT BILL

Cincinnati, O., Nov. 12—In the suit of the Ford Motor Co., of Detroit, against the Union Motor Sales Co., Lucien A. Howard, J. Carl Horton, Earl Saunby and William T. S. Yocum, of Dayton, Ohio, the complainants today, by leave of Judge Hollister, of the United States court, filed an amended petition. The complainant alleges that the defendants had infringed upon the patent and patent licenses in the sale of Ford cars at a price less than that fixed under the licenses, and that they had conspired with regular authorized agents of the Ford company for the purpose of securing cars under price. An injunction and damages are asked for by the complainant.

OFFER FOR W., C. & P. PROPERTY

New York, Nov. 12—The creditors' committee of Wyckoff, Church & Partridge, Inc., has sent notice to all creditors of the bankrupt concern that an offer for the property has been made to the receiver by Howard C. Dickenson, George A. Allis and Chester Griswold. It has been announced that if the offer is accepted by the creditors the purchasers will form a company to continue the manufacture of the Vaughan car and Commer truck as heretofore. Dickenson and Allis will represent the financial interests and Griswold will act as consulting engineer. C. F. Wyckoff and E. B. Partridge are reported as likely to be identified with the new concern.

FREY COMPANY BANKRUPT

Buffalo, N. Y., Nov. 12—The Frey Auto Supply Co., of 700 Main street, filed a voluntary petition in bankruptcy yesterday afternoon with the clerk of the United States district court. Total liabilities are said to be $18,500.87 with assets of $22,344.55, most of the creditors being Buffalo firms. The largest creditor, however, is the Lockwood-Luelkenger-Henry Co. of Cleveland, O., which claim amounts to $981.60. Charles L. Helsey is president.

SAVANNAH AFTER 1913 RACES

Savannah, Ga., Nov. 12—Special telegram—The Savannah Automobile Club, after a year's layoff, will re-enter the racing game. At a meeting of the club last night it was decided to file an application for the 1913 grand prix and Vanderbilt cup road races. The stipulation is made, however, that a sufficient number of entries must be guaranteed before the club will undertake the promotion of the classics. Also the formal consent of the military authorities to furnish soldiers to guard the course must be obtained.

explosive mixture, and if the exhaust passages and valve are small the dead gas does not all get out and the next charge of fresh gas will be diluted with dead gas, which makes the mixture burn slowly and cuts down the power of the motor.

The valve-in-the-head type makes the most efficient motor, for both intake and exhaust gases pass directly from the cylinder. The L-head cylinder, where one valve is in the head and one in the side, probably is next in efficiency, for one of them opens directly into the cylinder and can be as large as desired up to the diameter of the bore of the cylinder. The other valve, which is in a pocket at the side, gives a longer passage for the gas to pass through before it gets out, which means the gas cannot get out so fast. The T-head cylinder is not so efficient as the others mentioned because neither valve has a direct opening to the cylinder, but they can be as large as desired. This type has the disadvantage that two camshafts are needed, making the installation more expensive and heavy.

L-head motors with both valves in pockets on the side are the least efficient type in general of the four, simply because there is not room to make the valve as large as they otherwise could be made and the gas passages are not direct. They have the advantage, however, of using only one camshaft, which makes them cheaper to construct and lighter than the T-head motor, while the valve-operating mechanism can be readily inclosed and made silent, which is not generally true of the other two types of motors mentioned.

Alloys, Axles and Ignition Discussed

Detroit S. A. E. Listens to Three Most Interesting Papers

DETROIT, Mich., Nov. 8—At last night's regular monthly meeting of the Detroit section of the Society of Automobile Engineers, at which Secretary and Treasurer Alfred A. Greenburg presided in the absence of Chairman E. T. Birdsall, three very interesting papers were presented.

The first of these was given by William H. Barr, general manager of the Lumen Bearing Co., Buffalo, and chairman of the alloys division of the society. The subject was "Copper Alloys for Motor Car Service," and it was treated in a masterful manner by Mr. Barr, who gave a short history of copper. He stated that in the United States the metal is usually classified in three grades: Lake copper, that brought from the Lake Superior region; electrolytic copper, that refined by the use of the electric current; and casting copper, that which is not entirely refined, but carries varying amounts of impurities, and as a result is rapidly disappearing from commercial fields.

The United States produces more copper than any other country, or about 65 per cent of the total production of the world, the total amount for 1911 being 1,090,000,000 pounds.

Mr. Barr also touched upon the production, refinement and commercial uses of the various metals which are alloyed with copper to make bearing metals, viz., tin, zinc, lead. Brasses and bronzes were taken up at some length and the action of such chemicals as arsenic, antimony and sulphur on these alloys was explained. These three elements have a detrimental effect upon bronze, but sulphur in proportions which have been carefully determined by metallurgists is a beneficial agent.

The high copper alloys, as related to motor car construction, may be divided into four classes: Soft phosphor bronze, hard phosphor bronze, red brass, yellow brass. The properties, uses and general composition of these were explained.

"From the standpoint of the motor car engineer, it would seem that the same detailed attention should be given to the non-ferrous alloys in motor car construction, as is given to steel products and appliances. Too often, the decision as to what brass or bronze may be used, is left to the purchasing department, where price alone governs the selection," said Mr. Barr.

In the discussion of the paper which followed it was asked if there would be any value to any means of hardening copper Mr. Barr stated that no way has been found to harden pure copper. He also brought out that there are two concerns now making copper castings in which it is possible to guarantee an electrical conductivity of 85. Ordinarily, a conductivity of from 45 to 60 is considered good.

C. C. Hinkley wanted to know if it were possible to get a combination of low shrinkage and high wear in a babbitt metal. To this Mr. Barr replied that an alloy containing not less than 90 per cent. of tin, 4 per cent. of copper and 6 per cent. of antimony would come as close to these requirements as any. Perhaps a little less tin could be used. The antimony serves to reduce the shrinkage.

When asked if a small percentage of nickel would be of advantage in these alloys, Mr. Barr stated that as a result of many tests he has come to the conclusion that nickel is of little or no advantage. The effect of cobalt or any other similar element is about the same as that of nickel. He does not believe in nickel babbitts.

This discussion was followed by a paper by Maurice Wolf of the Anderson Forge and Machine Co., Detroit, which paper treated upon the B&L caster front axle, setting forth its construction and the advantages which are claimed for this type over the standard front axle. A paper which was in the form of a discussion of that of Mr. Wolf was read by Ernest R. Fried, research engineer of the General Motors Co. Mr. Fried did not agree with all the claims made by Mr. Wolf.

A most comprehensive paper by Ray H. Manson, chief engineer, Dean Electric Co., Elyria, O., entitled "High-Frequency High-Tension Ignition," was next presented. According to Mr. Manson, the use of high-frequency high-tension electric spark for ignition in the internal combustion engine introduces several unique and advantageous features. A high-frequency discharge is in the form of electrical oscillations, these oscillations rapidly succeeding one another, each succeeding one being of less intensity than the one preceding, and gradually dying down to zero. This electrical oscillatory action is similar to the mechanical vibration of a strip of metal or a tuning fork, which is firmly held at one end in a vise and struck by a blow. Its first vibration is the maximum, those following finally reducing to nil. The chief advantages which Mr. Manson gave for this type of ignition are:

1—Cranking on magneto at very low speeds.

2—Throttling the engine down to extremely low speeds without missing.

3—Positive ignition of poor mixtures.

4—Less heating of engine, due to more rapid and thorough combustion of gases.

5—Fuel economy, due to ability to ignite lean mixtures positively.

The high-frequency magneto system consists of a low-tension magneto with breaker-box and low-tension distributer, built very similarly to a standard magneto with the exception that the armature is wound with fairly coarse wire and that the condenser is stationary. It is located on the front of the distributer.

In addition to touching upon the high-frequency magneto system, Mr. Manson explained the high-frequency dual system, battery system and double system. The paper was necessarily brief.

BOOMING DALLAS SPEEDWAY

Dallas, Tex., Nov. 9—Jack Prince, who is booming the scheme to erect a 1½-mile board speedway in this city, reports that he has interested several of the prominent business men of Dallas in the proposition and that the deal most likely will go through. It is planned to have the first meet in April. Dallas' only fear is that enough entries cannot be secured to make the track a success, but Prince claims he already has assurances of support from most of the star pilots. Prince is making his headquarters at the St. George hotel.

Clearing House

Reader Tells How He Prevented Carburerer Freezing in Cold Weather—Cites Experience With Two-Stroke Engine —Duryea Favors Short Stroke

tion of ethyl alcohol, potassium-carbonate, quicklime, or calcium-chlorid are added to the solution to draw off the water, which is otherwise almost impossible to separate from the alcohol. To make alcohol in such a small quantity as 1 gallon would probably be very expensive, varying with the equipment used. In lots of several barrels, however, the cost will vary from 33⅓ cents to 50 cents per gallon. Alcohol has been found to produce, under favorable conditions, about 30 percent more power in a given set of conditions than gasoline in the same conditions.

HORSEPOWER OF VALVE-IN-THE-HEAD

Des Moines, Ia.—Editor Motor Age—I am driving a model 35, 1912 Buick, which has 3¾ by 3¾ cylinders. The motor is the valve-in-the-head type. Why has my car more power than cars with a larger bore and stroke? I have been told that the valve-in-the-head motor had about 10 or 15 per cent more power than motors of the same size.

2—Is there a formula by which one can figure the actual horsepower of the valve-in-the-head motor?

3—Is it true that the S. A. E. stated that the valve-in-the-head motor is the most powerful motor built?

4—Kindly explain in what way the heat affects a valve-in-the-head motor?—P. Kennington.

1—Whether or not your motor has more power or less than other motors of the same bore or stroke, at the same speed, depends more upon the general refinement of design than on the valve location. Of course the valve-in-the-head permits the use of a better shaped combustion chamber, which is claimed by the valve-in-the-head adherents to produce greater power for a given bore and stroke than is possible with other valve arrangements.

2—There is no recognized formula of this nature.

3—No.

4—This question is not clear. If you mean in regard to cooling, this valve location prevents as much water reaching the walls of the combustion chamber as is possible with the other types.

TIMING OF STEARNS-KNIGHT

Middletown, N. Y.—Editor Motor Age—I read your article in Motor Age, October 10, about the Stearns-Knight sleeve-valve motor. I would like to have you let me know how it is timed in case the silent chain should break, and the motor had to be retimed. Would one have to remove the bottom of the crankcase to get at the silent chain on the eccentric shaft? How would you get your port-openings?—M. A. B.

There is no danger of the silent chains used in this motor breaking, as they are capable of transmitting great power, and in this use have very little strain imposed upon them. However, the necessity for retiming is likely to arise with any motor. The crankcase has nothing to do with the timing drive on this motor, as the timing gears and chains are inclosed in an aluminum casing at the front of the motor, which is accessible by the removal of a face plate. To time a Stearns-Knight motor, the chain which drives the eccentric shaft is taken off and the sleeves are brought to a position wherein the exhaust valve ports register, when the piston should be at top dead center. The chains then are replaced, without moving either shaft. The appearance of this drive is shown in Fig. 1.

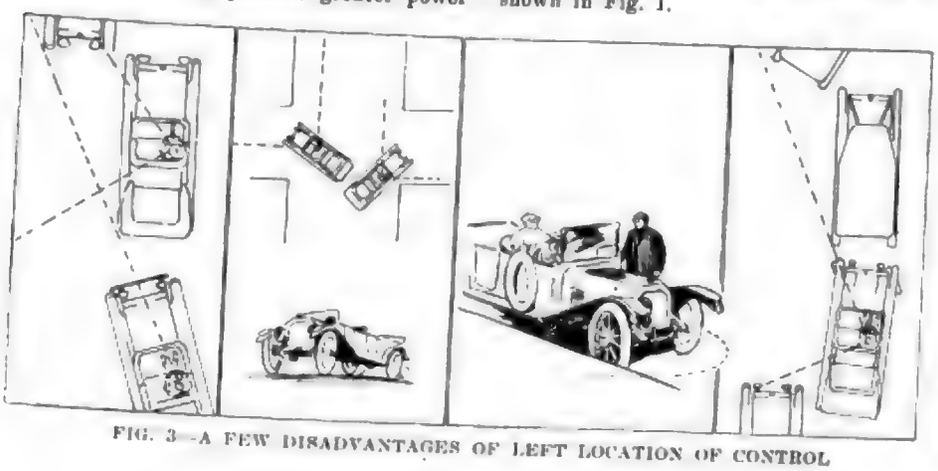


FIG. 3—A FEW DISADVANTAGES OF LEFT LOCATION OF CONTROL

Keeps Carbureter Warm

Motorist Describes Two Practical Methods of Preventing Ice in Mixer

How a Texas motorist installed a high-tension magneto on his Ford car. The magneto gear and cover were especially made and fitted for the purpose

ROCK ISLAND, Ill.—Editor Motor Age—I wish to suggest for the benefit of the many readers of Motor Age a good remedy for carbureter freeze-ups. Nine-tenths of the trouble in starting cars in cold weather is due to freeze-ups in the carbureter. All those who are compelled to use gasoline cars in the winter and who have to leave them standing out in freezing weather for 1 or more hours, will appreciate most any reasonable remedy.

For 5 years the writer has had his share of frozen carbureter troubles. People say that poor gasoline is the cause of the trouble, that the gasoline has water in it. Leave a tank of poor gasoline standing out in the alley when the temperature is 20 degrees below zero and look in it in the morning and see if you can discover any ice in it. You will not find any in the poorest test gasoline. The ice you have the trouble with forms in the gasoline after it leaves the tank in your motor car. It forms around the float in your carbureter, and around the air intake. The ice forms very much as it does on your window panes in the winter time.

I once had a freezeup so complete that we had to remove the tank to the carbureter, and when it was partially thawed out it was held up vertically and an icicle 8 inches long fell out. The ice actually bridged across the supply pipe. Last winter, after my first freeze-up in December, I determined to try a little experiment to avoid this distressing annoyance and I give the remedy here, hoping it will help some poor fellow when he has occasion to leave his car standing for several hours in a freezing atmosphere.

Experiment No. 1—First, I shut off my gasoline at the tank—after throwing off the switch—then opened the petcock in the carbureter and allowed all the gasoline and water in the carbureter and sup-

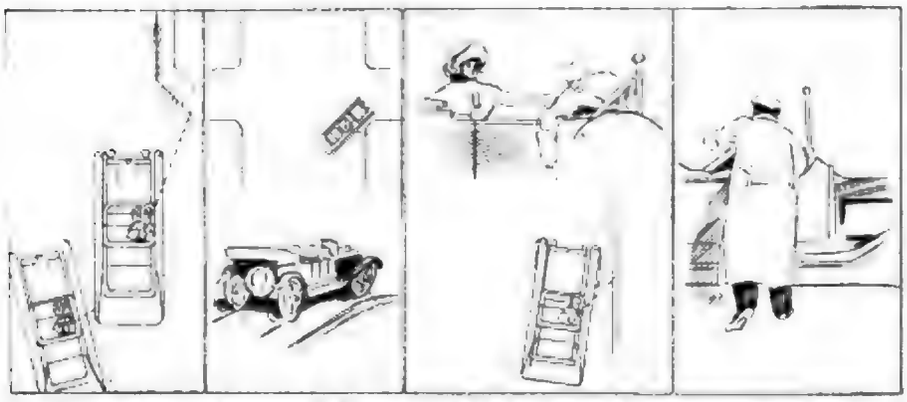


FIG. 4—SOME POINTS IN PRACTICE IN FAVOR OF RIGHT-HAND DRIVE

ply pipe to run out, then closed the petcock, and left the gasoline shut off at the tank until ready to start the car again. In starting the car I turned on the gasoline at the tank, put the switch plug on the battery and cranked up. The car will start nine times out of ten on the second or third turn, granting that everything is in working order when the car stopped. If it fails to start after cranking a few times prime the cylinders with a little gasoline and it will go. Even if you have a starter on your car and your carbureter is frozen, you will have trouble in starting your car, but this will prevent it.

Experiment No. 2—I found that experiment No. 1 was quite a little trouble, so found an easier way to drain the carbureter. I now shut off the gasoline at the tank while the engine is still running, and allow the engine to suck all of the gasoline out of the carbureter and supply pipe, leave it shut off until ready to start the car, then turn on the gasoline and start up in the usual way. Try it once and be convinced.—E. M. Sala.

LIKES THE TWO-CYCLE

Canton, Mich.—Editor Motor Age—Having noticed the article in Motor Age, dated at Grinnell, Kan., from a reader wanting to hear from those having had experience with the two-cycle engine, I would say first that I have no interest in any type of engine other than as a driver for pleasure and I am not interested in the sale of cars. I am now the owner of my fourth car. Three of them have been the four-cycle type, but early in August of this year I sold my four-cylinder four-cycle car and bought a 30 horse power roadster, weighing 2,600 pounds, of the two-cycle type, with rotary gas distributor, and have now driven the car about 1,200 miles, and for my own satisfaction have given it a pretty thorough tryout, both on heavy sand roads and hills, both steep and hard and sandy. I drove 70 miles from Manton to Kalkaska and return over part of the route selected by Grand Rapids motorists for their reliability run and the pathfinder who passed through here this week speaks of the Manistee river hill as the worst on their tour. This was on the route that I passed over and my car pulled up this hill without a stop, although the car was running under 5 miles an hour for the last 40 feet of the hill. This hill is long and sandy and I should think from 12 to 15 per cent grade.

Part of this road runs through jack pine and scrub oak plains, and there is no laid-out road and of course no grading of hills. Also it is pretty sandy. I made this run without getting out of the car and without boiling the water, and it is a thermo-syphon cooling system without pump. This week a driver of a 40-horsepower four-cycle car told me that he had to make three trials of this Manistee river hill before he got up, and I know of some cars that were unable to make the hill and had to drive around some 30 miles to another bridge.

I find the car pulls steadily and is especially strong on hills and in sand at low speeds. I am well pleased with it on the whole. I find the steady pull of the six-cylinder with its riding qualities at much less expense, both in the purchase price and the cost of operation.

I will try and answer the questions asked. The first one I do not understand just what is meant, but I have run the car 38 miles an hour and it makes this speed without any fuss. I have had no trouble with the engine overheating, even on these hard pulls through sand roads and the quantity of water used is very small. I have had no trouble with carbon and have had no repairs or adjustments of any kind made since I have had the car.

I think the car will run about 2 miles less on a gallon than a four-cycle of the same weight and horsepower. I have been making about 12 miles on a gallon and with my four-cycle I made about 14 miles over about the same kind of roads. I have had no trouble with the lubrication of the engine. I use about a pint of cylinder oil to about 8 gallons of gasoline and put it right into the gasoline.

I have had no trouble starting the car. I have gone out to the garage several mornings when the ground was white with frost and have been able to start the car in 2 or 3 minutes by priming with a little wood alcohol. During the warm weather it was not necessary to prime the motor at all and I have been using a low grade of gasoline, which costs now at retail 18 cents a gallon. I think it starts about the same as the four-cycle. I am not much of a driver for speed as the 38 miles an hour is the fastest I have driven but I am of the opinion that it is not so fast as the four-cycle engine.

The only fault I can find with the engine is that when standing still it runs unevenly and has a pounding noise which I do not like to hear, but when the car is running this disappears and the engine runs very quietly; in fact, about all that can be heard is the noise made by the vibrator points. In running down grade when the car goes faster than the engine we again hear the pounding noise, but this usually can be stopped by a little manipulation of the spark and throttle. I am of the opinion that we will hear more of the two-cycle engine in the future than we have in the past.—J. Edward Jones.

FLAXSEED IN RADIATOR

La Junta, Colo.—Editor Motor Age—The radiator on my Marmon car heats badly. It was leaking some and I put in about a pint or more of flaxseed meal then ran it for about 10 miles without cylinder oil. It grew very hot and I think baked the meal to the cells and since then I have been troubled with its heating badly. It is a zig-zag type of radiator. Is there anything or any way to remove whatever chokes it up and clean it thoroughly.—A Reader.

The tubes of your radiator are probably badly clogged. The flaxseed meal in all likelihood was made into a dough in the radiator, and then baked. It is quite likely, too, that this has affected the cylinder jackets and piping, and possibly the pump besides. There are several preparations on the market for the purpose of cleaning out a radiator. Among these are the following: Apex Radiator Cleaner, Banner, Decalcifier, Black Diamond, Fast Auto Compound, Radi-No-Leak, Fluff fer Colza, Wonder Worker, R. R. R., Nekoroda, Valvet. These may be purchased of most dealers.

DURYEA DISAGREES

Saginaw, Mich.—Editor Motor Age—The reply to Reader about the long stroke motor leads me to a criticism of the answer. I believe the long stroke does not give greater expansion. If it did, engine designers could get any desired economy and efficiency by simply expanding further. Such engines as the Atkinson which had a short suction stroke and a long expansion stroke never would have been built.

There are but 180 degrees to a full revolution and since it is common to open the exhaust valve about 40 degrees before the bottom of the stroke, the expansion stroke cannot be longer than the remainder, or 140 degrees. The length of the stroke has nothing to do with expansion. The number of degrees is the only thing to be considered. A short stroke

motor can just as easily and as fully expand as a long one.

Look at it another way. We assume that the compression stroke is 180 degrees. Because of lag of the gases and slowness of valve action, it is quite common to open the inlet later and close it later, but we can ignore any slight differences for the present argument. This means that the four-cylinder engine compresses for 180 degrees and expands for 140 degrees. And the negative work of compressing in a long-stroke motor is a disadvantage in the same sense that the long working stroke is said to be an advantage. The crank has to be long for the long stroke so it has not the short powerful leverage for doing the compressing that the short-stroke crank has.

If we could use a short crank for compressing and a long one for working we then would gain some, and this is the effect the salesman tries to produce in the mind of his customer. But it is wrong. The length of crank has very little if anything to do with the problem. If the crank is long the piston moves fast and what is gained in leverage is lost in motion. In other words, it is a manner of gearing. Speed and power are interchanged. The short-stroke motor has a big piston with much power behind it and very slight motion. The long-stroke has the reverse. It is for the engine designer to find the ratio which is best for his needs.

The laws which govern gas engines were laid down fully 50 years ago; long before successful engines were on the market. They are generally admitted. And the engine designer who does not conform to them is going astray. One of them requires that the cylinder walls shall be of the least possible area for the volume of gas used so as to economize the heat of the gas. Another that the expansion shall be as fast as possible so as to use the heat in doing work instead of allowing it to escape into the walls as it will do in a very short time.

The shape which gives least wall surface for any given volume is the spherical one. So our engines should be so designed that they are shorter than spherical when at the compression end of the stroke and longer than spherical when at the point of opening the exhaust. Just what this proportion should be is a question depending on the rate of combustion and many other factors. We may approximate it by assuming the compression space for 60 pounds to be 31 per cent of the stroke, or 1¼ inch in a 4-inch stroke motor. The exhaust may be assumed to open about ¾ inch ahead of bottom. So the total length in which the hot gases are confined will be about 4½ inches. Some designers think that the bore should be this size in order that the spherical shape should be worked up to, as the end of the stroke is approached. It seems to me, however, that the spherical shape should be reached before this point. At mid-position the piston would be 3¼ inches from the head and the bore should be 3¼ inches to afford the spherical shape. Or if we take the mid-length of the distance from the head to the opening of the exhaust we have 2¼ inches as the proper bore. This is properly a long-stroke motor. The other sizes mentioned are not.

But other factors come in for consideration. Rapid expansion is required. Now anybody should see that a small-bore cylinder does not offer the chance for rapid expansion that a large-bore one does, for the cylinder content varies as the square of the bore but only as the length of the stroke. So in order to get rapid expansion of the gases with a small-bore engine we must run the piston at very high speeds, which gives rise to high friction and heating effects that soon get beyond the ability to lubricate. This is why, as Motor Age correctly says, for racing work, the short stroke gives better results.

Then the engine uses must be considered. For stationary work we can determine the speed wanted, figure the piston speed at that speed and make the stroke to suit. The early motors were built with bores and strokes derived in that manner. But experience with motor cars showed that we want most of all flexibility. The flexible engine is the one that can push powerfully at low speeds and run as fast as desired so that we need not be changing gears all the time. The big bore can give the powerful push. The length of the crank does not matter so long as the bearings are such that the push is not eaten up by friction. Very few engine makers will admit that their cranks are so small as to spring or their bearings so poor that they cannot take the push from the small-sized pistons used in motor car practice without losing a lot of power in friction or hurting the bearings.

The long crank requires a long rod to avoid great angularity and side friction on the piston. So engine makers began to work toward shorter strokes and larger bores. And they were quite right. This makes the best motor car. But engines began to get so big that racing authorities had to take notice, so the French decided not to permit larger than certain sensible bores. The maker of racing freaks then began to try to beat his competitor by using long strokes. And long strokes went to an extreme, not to get the best but to get the biggest.

Next in England they began to tax according to horsepower, and they figured the horsepower from the bore only. So the maker cut down the bore and lengthened the stroke. These two things made long strokes and small bores fashionable but never better. Style and not service is doing the rest in this land.

In Europe they are trying to make up for the lack of flexibility by adding more changes of speeds. But the buyer who knows what he needs wants a gas engine that will respond like a steam engine and not speed changes except in emergencies, and there is no question but that the short stroke meets this need best. The short-stroke motor is shorter, lighter for a given power, has smaller crank case, and offers more room in the heads for the valves. In short, it is better in every way except in the matter of theoretical heat losses; and it is unfortunate that buyers and others seem to imagine that in some way it gives greater expansion and more power. If they really want greater expansion they must go to some other means, as for example, the two-cycle engine. There is much misinformation about this type also and few people see that it expands the full length of the compression movement, whereas the four-cycle expands but about fourteen-eighteenths. In short, the compression of a two-cycle does not begin till the exhaust port closes and the expansion ends at the same point on the down stroke. This requires a slightly smaller compression space and results in a very perceptible greater expansion and economy. That many two-cycles have not been economic is due to other and preventable causes, for there is no question about the advantage of the long expansion and the constant compression as well as the small combustion space of the two-cycle.—Charles E. Duryea.

REPAIRS FOR POPE TRIBUNE

Tulsa, Okla.—Editor Motor Age—Please state in the Readers Clearing House where the Pope-Tribune Mfg. Co. is located, or where I can get repair parts.—G. L. S.

The Pope Mfg. Co., Hartford, Conn., maker of the Pope-Hartford car handles the repairs of the Pope-Tribune car.

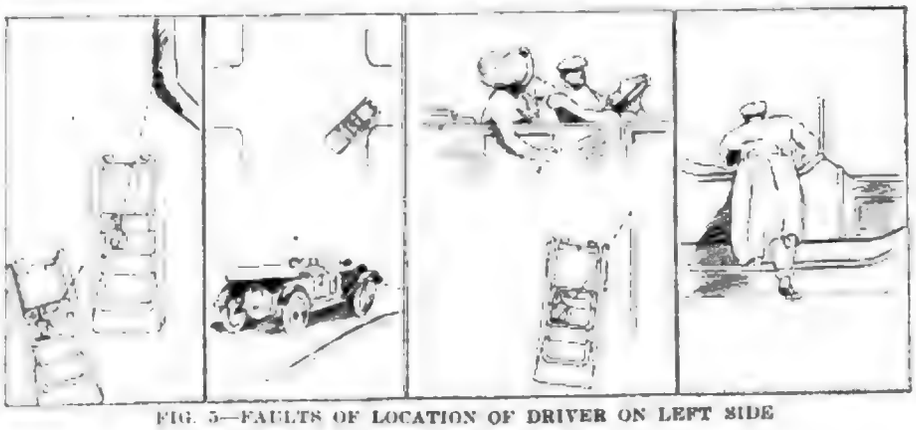


FIG. 5—FAULTS OF LOCATION OF DRIVER ON LEFT SIDE

Current Motor Car Patents

MICHELIN RIM

Michelin Demountable Rim—No. 1,043,714—To Andre Jules Michelin, Paris, France, assignor to Michelin & Co., Clermont-Ferrand, France. Filed May 2, 1911, dated November 5, 1912. Simplicity marks this rim more than any other feature, as it consists of but three pieces. Two of these are felloe segments, hinged at their two adjacent ends to one another, and being linked at their opposite ends to a short segment, which constitutes the remainder of the wheel felloe, and which is adapted to be moved inward, contracting the rim, and permitting the removal of the tire from the wheel.

Combination Motor Car Signal—No. 1,043,704—To Miller Reese Hutchinson, New York. Filed May 4, 1910, dated November 5, 1912. This signal consists of a combination of a reed horn and an electric diaphragm signal. The projector consists of an open-mouthed tapering chamber, closed at one end by the diaphragm, and having an opening into the convolutions of the horn trumpet. The bulb and reed are attached to this in the usual manner, while the electric signal is secured to the back of the diaphragm, immediately behind the horn tubes.

The bulb-horn may be used in the city, while the more penetrating electric horn is available for cross-country work, the double equipment taking no more space than the usual single equipment of either type.

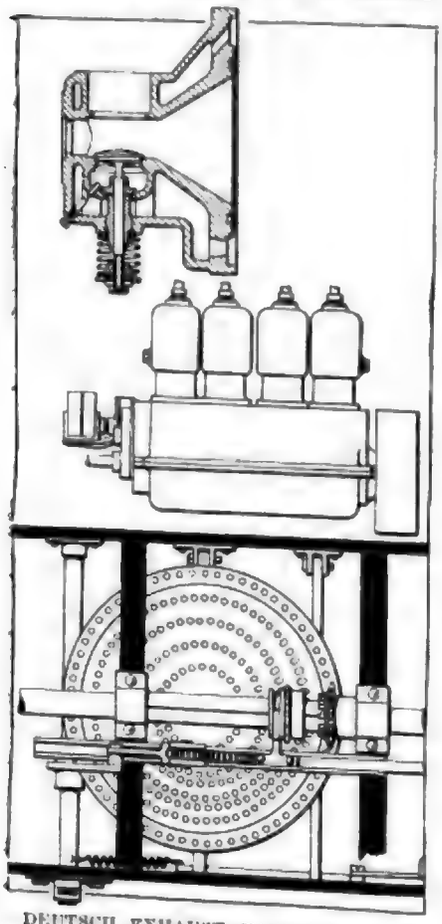
Gear-Change Mechanism—No. 1,043,499—To Warren W. Anable, Grand Rapids, Mich., assignor of one-fourth to Fred Z. Pantlind, Grand Rapids, Mich. Filed February 20, 1911, dated November 5, 1912. Operating on the same plan as the ordinary disk-and-wheel friction drive, but depending upon radically different principles of operation, this arrangement consists of a disk, which is laid across the bed of the vehicle with its axis of rotation vertical, which is provided with a series of perforations in the form of concentric rings. The driving and driven shafts are situated across the face of this disk, longitudinally of the chassis, and revolving independent of each other. The driving shaft is secured to a sprocket pinion, which meshes with the outer series of perforations. The driven shaft is secured to another sprocket pinion, which is adapted to be moved across the face of the disk and engage with the perforations of the disk, the inner ones of which afford low speed, and the outer of which afford high speed. When the driven sprocket is moved adjacent to the driving sprocket, its teeth revolve in a groove in the disk, and a clutch secures it to the driving sprocket, producing direct drive on high gear. The gear is lowered or raised by dropping the disk and moving the movable driven pinion along its shaft, locking it opposite the series of perforations to be engaged with and raising the disk again. This is accomplished by suitable controls. A friction clutch of the ordinary type would have to be fitted.

It is presumed that the gearshift would be controlled by the usual lever, and that the dropping of the disk would be accomplished in conjunction with the clutch control action.

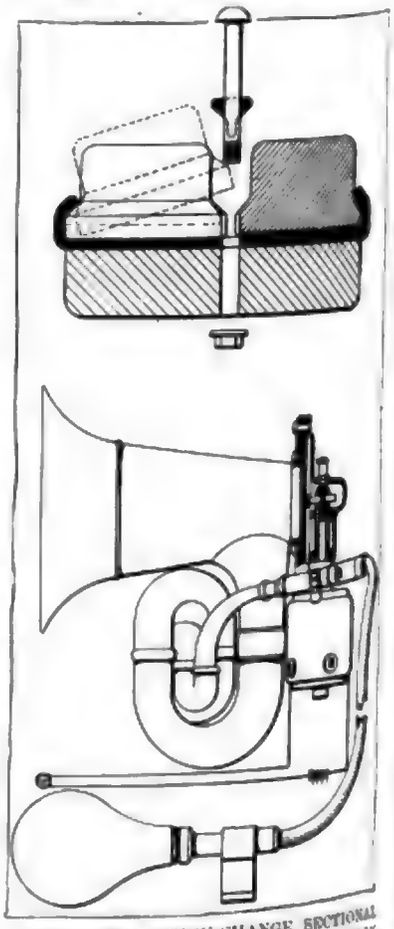
Briggs Magneto Mounting—No. 1,043,116—To William S. Lee, Detroit, Mich., assignor, by mesne assignments, to Briggs-Detroiter Co., Detroit, Mich. Filed November 24, 1911, dated November 5, 1912. This mounting of the magneto is at the rear of the motor, the armature shaft being parallel with the driving shaft of the motor. The timing gears of the Detroiter motor being in the rear, the drive to the magneto gear is direct from the camshaft driving gear. The magneto is supported on a right-angle bracket, which carries the bearing and taper-sleeve. The bearing is held in a disk which is provided with apertures to permit a tool to be inserted for the purpose of positioning the gear.

Exhaust-Valve Cooling Device—No. 1,043,076—To Charles Deutsch, Amiens, France. Filed December 12, 1911, dated November 5, 1912. To cool the exhaust valves of high-powered engines, this patent relates to a spray nozzle situated in the exhaust pocket, beneath the valve, which is adjustable, to admit varying quantities of water to the nozzle, to be sprayed on the valve, cooling it.

Quick-Demountable Block Tire—No. 1,043,061—To Percy B. Bosworth, Akron, O., assignor to the Firestone Tire and Rubber Co., Akron, O. Filed February 6, 1911, dated November 5, 1912. This means of applying block tires consists of a solid rim, adapted to receive two rows of tire sections, and provided with a retaining bead on its outer edges. Retaining clamps are bolted between the two rows, which spread the blocks, and clamp them to the rim. Their removal permits the blocks to be moved inwardly to clear the outer rim bead so that they may be removed.



DEUTSCH EXHAUST-VALVE COOLER—BRIGGS MAGNETO BRACKET AND DRIVE—ANABLE GEAR-DISK CHANGE-GEAR



BOSWORTH QUICK-CHANGE SECTIONAL BLOCK TIRE—HUTCHINSON COMBINATION ELECTRIC AND BULB MOTOR CAR HORN

The Motor Car Repair Shop

Hints for the Amateur

Water Ruins Ball Bearings

OWING to complaints from car agents that the ball bearings of the front wheels were too small and not giving the proper service, the engineers of a certain motor car factory, knowing the bearings to be quite large enough and with a generous capacity for overload, made an extensive investigation as to the causes of these troubles. As a result it was learned that the greater number of complaints came in after a spell of rainy weather; also, that there were comparatively few complaints from territories where the weather generally was dry.

This was a fair indication that the trouble was due to the entrance of water into the wheel hubs and onto the balls and ball races; and that the rusting of the bearings, or the cutting of the sand carried in by the water, rendered the bearings unfit for the work to which they were subject. To overcome this the factory is now fitting a more effective felt washer device to keep the oil in and the dirt and water out; and using a more suitable lubricant.

Leaky Gearsets and Axles

There are many motorists having difficulty in keeping their cars or garages clean owing to the fact that oil and grease seem to continually leak from the gearbox and rear-axle casings. Where oil is used, the unwise agent often suggests the use of a hard grease; which in a comparatively short time may be worked up into the recesses of the case where it does no good whatever.

There are many gearsets, of course, which are so designed that grease can be used most advantageously; but where the manufacturer recommends the use of a fluid oil, it should be used. The greater amount of the oil-leaking trouble experienced by motorists, is due to the use of too much oil in the transmission gearbox and rear axle casing. In a gearbox in which a fluid oil is used, the amount of lubricant maintained therein should reach no higher than the lower portion of the lowermost gearshaft; this pertains to gearsets in which the shafts are in either a horizontal or vertical plane. In a gearbox having both the gearshafts in the same horizontal plane, both the shafts will be partly submerged in the oil; and though only the lower shaft of a gearset having the shafts in the same vertical plain will be partly submerged in the lubricant, this shaft and its gears when in motion will throw plenty of oil onto the outer working mechanisms in the case. If too much oil is used, it only tends to work out through the bearings, causing a waste of oil, and dirtying the streets or garage floor wherever the car may stand.

The same applies to the lubrication of the rear axle, the only difference being that the oil which escapes not only tends to render the brakes ineffective, but often the oil is thrown out onto the wheels, tires and car body, giving them a very dirty appearance, damaging the two latter, and making considerable work for the unfortunate car washer. Should a reduction of the amount of oil used prove ineffective, have new felt washers fitted to the axle ends.

A Handy Motor Stand

In Fig. 1 is shown a type of motor stand employed in the Argyll motor car factory of Scotland; it is constructed of steel and iron throughout and is exceptionally light for so substantial a contrivance. It comprises two shelves, mounted on tubular legs, having rollers or casters at the lower ends to facilitate moving the stand about. While the top shelf, or table portion, is quite large and roomy with raised edges like those of a dish, the lower shelf is smaller and flat, and designed to support the tool box of the workman. The top shelf forms an excellent support for tools in use, and the small parts being operated upon; while the raised edges tend to prevent smaller parts from rolling or being rapidly pushed off therefrom. This stand differs considerably from similar structures now in use, in that it has secured to it a heavy vise which practically converts the stand into a small portable work bench.

Grinding in Valves

About this time of the year, motorists who have been giving their motor cars hard service for the past few months, or since the spring overhauling, may find that the motor is beginning to show a slight loss of power, or that misfiring or a jerky action of the car is noticeable occasionally at low speeds. This may be due to poor compression, caused by ill-seating valves.

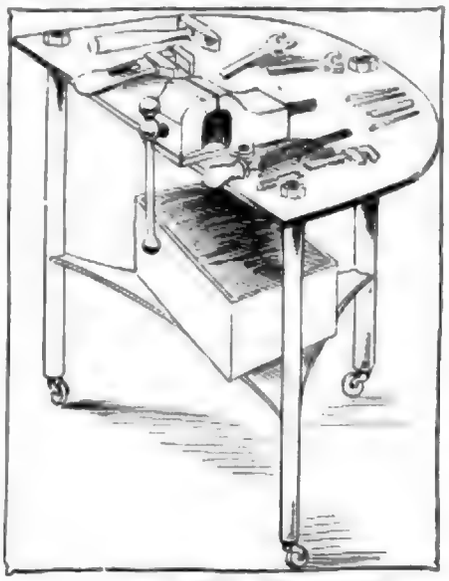


FIG. 1—HANDY MOTOR STAND

To test the compression of a motor, one has but to crank it slowly for several revolutions of the crankshaft, and at the same time carefully feel the compression resistance. If the resistance is comparatively strong and of an elastic or reactive character, it is good; and a fair indication that the valves are seating tightly. It also should be noted, however, that the compression in each cylinder, or the resistance to cranking, is equally great.

When a loss of compression, accompanied by a consequent loss of power, makes it necessary to reseat or grind in the valves of a motor, the sooner the job is performed the better.

To grind in a valve, first remove it from the motor; if possible block up the entrance between the valve chamber and the cylinder with a cloth having a string tied to it so it can be withdrawn should it fall into the cylinder, then scrape and clean the carbon incrustations off the seats of the valve so that they can be examined. If the valve is badly pitted, it is well to begin the grinding operation with a coarse grade of emery. The emery may be applied in two ways—either a little emery powder and cylinder oil may be mixed into a paste and applied with the finger; or a coat of the cylinder oil may first be applied to the valve seat with the tip of a finger, then the oily finger dipped into the powdered emery and that which adheres to it applied to the oily valve seat.

The grinding operation consists in turning the valve about half a revolution back and forth on its seat in the cylinder by means of the tool in the one hand; and occasionally lifting the valve from its seat and shifting it around with the other hand. The valve should be lifted about ¼ to ½-inch every five or six reversals to keep the oil and emery well distributed. The pressure on the tool should be slight. Every few minutes the valve should be removed, the seats cleaned off and examined, and a new solution of emery and oil applied.

When the pits are almost removed, continue the operation with flour of emery instead of the coarser grade; remove the valve oftener, applying more oil and less emery each time, until a good seat is obtained all around; then finish up by polishing the seats with oil. Kerosene is most effectively used in the finishing the seats of a valve, and the higher the polish obtained the less chance there remains for accumulations of carbon.

many men at once took on the new vehicle and put it to work. Many were surprised to find that they could not make them pay and discontinued the motor in disgust. These are now waking up again to the fact that the truck was not to blame formerly but the delivery conditions at the time. As these have changed very materially even in the last few months in the big cities through the influence of the many trucks now running, they see a chance to make good on their former experience.

Lost Time at Freight Depots

Take the freight depots, for instance. These are in many cities the worst offenders in the matter of lost time. Motor vehicles have had to wait from 40 minutes to 2 hours before they could get unloaded at the congested platforms of our city freight depots. Not long since the writer saw in Minneapolis a line of eight wagons waiting to unload at a freight platform with a motor truck the last in the line. A few days later a similar line was noted at a Chicago platform. At the end of the line was a 3-ton motor truck, the driver sitting astride of the hood of the car smoking and waiting, as he leaned back against the windshield as a back rest. The wait did not seem to chafe him any as he was used to horse-pace unloading methods—and anyway what would be the use in his trying to hurry? The other drivers would only laugh at him.

Conditions are changing at these stations, however. As motor trucks come increasingly to the platforms and make these long waits shipping clerks are finding out the delays. They are making complaints to the railroads and these roads, aiming to draw custom to their lines, are arranging with the larger shippers to give their machines preference.

Delays Are Explained

The driver of a certain Chicago motor truck of large tonnage which makes frequent trips to one of the freight yards was asked recently about the delays at these points.

"We don't have any trouble," he answered, "we've got things fixed down there so that when we come in we get a door right away. If we can't get a door right away they load us outside. You see we ship a lot of stuff over their road and they want our trade. If they can't fix it so we can get our load quickly and get away quickly, why we'll ship over the X and Q. They'll fix it for us quick enough."

This truck hauls six 3-ton loads a day from this station as against three smaller loads formerly done by horses.

All of this is going to affect the small shipper eventually, for as soon as the railways realize what a magnet for business the installing of a quick unloading and loading business arrangement at shipping points would be, they will install such a system. If the A road can unload a truck and send it away with a load in 20 minutes from the time it arrives while the B road keeps a truck waiting 2 hours before it can get away, it is easy to understand that the truck owner will ship over A road whenever it is possible and steer clear of B freight platform whenever he can.

As motor truck use is increasing at an enormous rate the influence brought to bear on those responsible for these congested delivery points is building up a new feeling of these men toward the truck as a possibility instead of a nuisance.

In Chicago the demands have become so insistent that a special meeting of those hauling to these points has been called by the traffic department of the city for a discussion and the development of ways and means for bettering conditions. Chicago officials favor the motor vehicle as one of the solutions of traffic congestion downtown and with their influence together with that of users and owners of motor vehicles the new sentiment will soon take tangible shape.

Drivers as well are acquiring a new feeling toward motor trucks, with some a favorable one, with others unfavorable.

Talking with a Chicago driver for a coal company recently the attitude of drivers of his class was well explained. During the talk the smell of cheap whiskey was the predominating feature. The man himself was the result of horse-pace methods of living.

Attitude of Drivers

The occasion was one where the coal wagon with three horses was held up by a narrow alley and an exceptionally inconvenient coal hole. After waiting 1½ hours at the entrance to the alley the wagon finally got in only to find the coal hole covered by the wheel of a wagon delivering water to a large office building. On inquiry the driver found that it would be at least an hour before this wagon left. There was no one on the wagon and no place to take it to, so that there was nothing to do but wait—an example of some of the delivery conditions met with by coal wagons in Chicago.

Texans Find in Motor Car

Real Estate Men Maintain Fleets for Use of Their Customers

By W. D. Hornaday

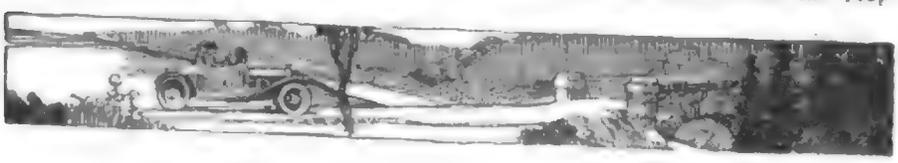
MORE than fifty motor cars were employed 1 day recently in transporting prospective land buyers over a large ranch tract in south Texas that is being opened for settlement.

The use of motor cars in the sparsely settled portions of the country is doing more perhaps to bring about the colonization of ranch lands by farmers than any other one factor. In the days before this modern vehicle came into use it was impracticable to convey land prospectors to properties situated many miles from the railroad, and as a result of that condition the farm development had its beginning close to the railways. It is now possible, by the use of motor cars, to convey prospective settlers anywhere from 10 to 50 miles from railway points and back again within a few hours.

All of the larger land selling agencies now keep in constant service anywhere from one-half dozen to as many as twenty-five motor cars for the special purpose of handling the crowds of land prospectors that desire to be shown over the properties. In case of an unusually large number of prospective buyers arriving on the same day the land men press into service extra motor cars which are loaned them by their neighbors. It was on such a day as this that the colonizers of a large tract or ranch land in the lower gulf coast region of the state recently found it necessary to provide cars for nearly 200 home seekers.

The roads in nearly all the ranch region of the state are exceptionally good. While little work has been done upon many of them, they naturally are in fine shape except in periods of rainy weather. So important has the use of motor cars become in the country districts of Texas that one of the first improvements that is made by many of the colonization people when they prepare a tract of land for settlement is the construction of good highways through all portions of it. One of these concerns that is rapidly converting a ranch of about 100,000 acres into farming tracts has constructed more than 500 miles of good roads through the property. These roads are not only used to advantage in showing the land to prospective purchasers but they are of great benefit to the new settlers themselves.

Many of the men who are establishing themselves in these new homes are comfortably well off in worldly possessions and nearly all of them own one or more motor cars. They are a different type of immigrants from the element that invaded the west in the earlier days. There is nothing of the boom type about them. In most cases they are the sons of well to



Its location was such that the load could not be gotten off from the tailboard or the side chutes of the coal wagon, requiring that it be shoveled off by hand over the rear wheel, from the best position that the wagon could eventually take.

The driver waited, and while he waited discussed the coming of the motor truck.

"We fellows," said he, "are getting the worst of it from these motor wagons. You see, we are paid by the load. Now I get $1.17 for delivering this load and see how I'm held up. How many loads like this could I deliver in a day? Not many. And yet the company doesn't make any difference.

Teamsters Losing Money

"We used to get a lot of good hauls, easy places to unload and only a few of this kind. Now the trucks get all the good ones and we get stuff like this. It only means that we can't make as many trips and don't get the money we used to. The motor trucks are coming all right, I guess, but they are hurting us fellows right now."

"You see, when we load we get it, too," he continued, "for when a motor truck comes in the coal yard they let it go ahead and we have to wait. You see we get it at both ends."

He was asked if he wouldn't like to run a motor vehicle.

"Well, I was offered one last year," he answered, "but I thought I'd stick to my team. I've got some pretty fine horses there."

There is this side to be considered and yet nearly all of these drivers who wish it and work for it will have a chance to drive trucks at better wages. The ones who don't want to advance and who hold to the old through sentiment will suffer for it as the shoe manufacturer of England told of recently by a friend. This man, a wealthy uncle of the man telling the story, had been engaged in the shoe manufacturing business for many years in England and had made a small fortune at it. All his product was advertised as real hand-made. With the advent of shoe-making machinery the old gentleman refused to be influenced by their coming, sticking to the old things, and making his advertised hand-made shoes in spite of popular demand until he lost his whole fortune.

There are many drivers and horse users who on a smaller scale are going to go through this same experience. If they do not join in with the change of sentiment, take up the motor vehicle for what it is worth, grow and develop out of horse-pace methods and come to a higher level, they will be eliminated in the process.

The third branch which has been moved to a change of sentiment is the receiver of the delivery.

At first the motor truck was looked upon as a luxury indulged in by the buyer as an advertisement. It cost so much more than horses, how could it be other than extra money and an increased cost? For this the consumer had to pay.

The housewife took some pride in having the new vehicles stop at her door, and was willing to pay a trifle more for her groceries if they were delivered by a smart electric, but the business man who had the goods coming to his store in trucks thought differently.

When R. R. Anderson bought a motor truck for his commission business on South Water street in Chicago, one of his prominent customers took objection to it on the ground that the machine which cost $2,000 to $3,000 was bought out of profits from him, and that if he, Mr. Anderson, could afford to buy motor trucks at $3,000 he could afford as well to shave his profits a little to his customers' advantage. The customer felt that his own good money had been spent for the new truck.

Truck Economy Demonstrated

However, this feeling is now far from general, for the economy of the motor vehicle is becoming better known every day and a firm which buys motor vehicles nowadays is not thought of as extravagant but as thrifty and up to date. The customer who receives his perishable goods in winter without its freezing on the way, or who gets his load of coal on schedule on a stormy winter's day when horses work at their worst, or who, living 6 or 8 miles from the city's center, receives his delivery of a package within an hour or two after his order was given, feels that the truck is a success and looks for its coming in other lines which it has not entered as yet where he feels better service is needed.

Truly the sentiment toward motor trucks is changing rapidly. There has been more ery of a package within an hour or so than 100 per cent of increase in the number of motor trucks in our cities within the last year. Each truck put into use freight and goods handling which make for more speed and efficiency. As this efficiency increases at new points new lines can take up the truck and make it pay, so that coming in cumulative numbers a few years hence should see the unsanitary and wasteful horse abolished from cities.

a Vehicle for All Needs

Ranchmen Now Able to Live in Town Because of Owning Power Machines

do farmers of middle western states who have gone to Texas for the purpose of reaping the benefits of obtaining land at low prices, with the assurance that it will increase rapidly in value and that it is capable of producing profitable crops of various kinds.

It is in what is known as the plains country of Texas, which embraces all of the panhandle region, that the motor car is put to probably its greatest practical use by land owners, not only by the farmers but the ranchmen. Nearly every man in that part of Texas owns a motor car. Through their every day use they have wrought a transformation in the method of conducting the stock-raising and agricultural industry. Instead of living in little shacks on their ranches as formerly most of the big land owners now have their own comfortable homes in town and make daily trips to and from their ranches. It enables the people to carry on their business with far greater dispatch than the old way of living.

The ranchman keeps in close daily touch with the markets and the affairs of the outside world through his residence in town and at the same time is just as closely associated with his work upon the range as when he lived there. The cars are used quite generally during the round-up season, not in actually rounding up the cattle but in transporting the owners and cowboys from place to place upon the ranches and carrying in supplies and for a variety of other practical purposes. Farmers in the plains country use the motor car to carry to market butter, eggs and vegetables and to haul home groceries and supplies at a great saving of time and labor.

Another important result which comes from the use of motor cars in the region of magnificent distances all through the southwest and west is the creation of a more social spirit and friendliness on the part of the inhabitants towards each other. It is now possible for families to visit their distant neighbors at frequent intervals. It is not uncommon for young people to ride 70 to 75 miles across the plains in a motor car to attend a dance or some other social gathering and return home the same night. The social sphere of the community has been vastly widened by the use of this conveyance in the Lone Star state.

Chasing coyotes in motor cars is a favorite amusement in the plains region. This sport can only be carried on in large pastures where there are no wire fences to interfere with the chase. It is comparatively easy to run down a coyote in a motor car. The animals are short-winded and can keep up the speed for only a few miles.

Brief Business Announcements

Agencies Appointed by Motor Car Manufacturers

Town—	Agent	Car
Arcata, Cal.	J. P. Rusthol	Cole
Atlanta, Ga.	Roger Kees	Baker
Atlantic City, N. J.	W. B. Thompson	Cole
Auburn, Neb.	Workman & Rozean	Reo
Auburn, Neb.	Workman & Rozean	Little
Avoca, Ia.	Nort & Derby	Little
Baltimore, Md.	Charter Automobile Co.	Havers
Belgrade, Neb.	W. H. Andrews	Cartercar
Boston, Mass.	Dodge Motor Vehicle Co.	Buffalo
Bridgeport, Conn.	D. & H. Auto Distributing Co.	Klinekar
Buffalo, N. Y.	Edgar C. Messersmith	Wagenhals
Buffalo, N. Y.	Windsor Motor Car Co.	Klinekar
Cambridge, Md.	E. J. Brannock	Marathon
Central City, Neb.	Linderman & Blake	Michigan
Charleston, Mo.	Luke Howlett	Moon
Cincinnati, O.	F. H. Berold	Havers
Columbus, Neb.	E. A. Smith	Cartercar
Columbus, O.	O. G. Roberts & Co.	Gramm
Columbus, O.	Murnan Taxicab Co.	Moon
Columbus, Pa.	Columbia Auto Co.	Mitchell
Des Moines, Ia.	Van Vliet-Bradt Motor Co.	Moon
Elliott, Ia.	M. Lembke	Michigan
Elyria, O.	H. M. Andress & Co.	Havers
Fall River, Mass.	Eckberg & Place Garage Co.	Franklin
Franklin, Pa.	King Automobile Co.	Klinekar
Frederick, Md.	H. A. Hann	Krit
Frederick, Md.	James E. Solt	Paige-Detroit
Fullerton, Neb.	T. M. Sheath	Cartercar
Hartford City, Ind.	A. W. Tindall	Cole
Hartington, Neb.	Nelson & Roskopf	Studebaker
Hannibal, Mo.	Long Mfg. Co.	Moon
Kansas City, Mo.	Bond Motor Co.	Gramm
Kansas City, Mo.	Warriner & Dailey	Federal
Lincoln, Neb.	Wertz Auto Co.	Studebaker
Lowell, Mass.	Joseph Marin	Rambler
Marcus, Ia.	Johnson, Petty & Johnson	Moon
Melrose, Mass.	Smith Brothers Garage Co.	Overland
Memphis, Tenn.	Tennessee Motor Co.	Buick
Memphis, Tenn.	V. L. Gogers	Stearns
Milwaukee, Wis.	W. E. Allen Co.	Marathon
Milwaukee, Wis.	Wollsager Sales Co.	Studebaker
Minneapolis, Minn.	Alexander Brunner	Klinekar
Newark, N. J.	MacArthur-Zollars-Thompson Co.	McIntyre
New Orleans, La.	Arthur Marullo	Dart
New York	Gildel Auto Co.	Klinekar
Norfolk, Va.	C. L. Young	Cole
Ogallala, Neb.	Jay Ellingsworth	Studebaker
Orange City, Ia.	Aerrote Van Der Wilt	Moon
Plattsmouth, Neb.	Kroehler Brothers	Cartercar
Providence, R. I.	Henderson	J. B. Higginson
Reno, Nev.	Reo Nevada Co.	Cole
Rochester, N. Y.	Beardsley & Gallagher	Havers
San Francisco, Cal.	W. T. Stone	Standard
Schleswig, Ia.	G. T. Hollander	Michigan
Seattle, Wash.	Louis Roesch	Velie
South Bend, Ind.	Warde L. Mack	Franklin
Spokane, Wash.	W. R. Dean	Stevens-Duryea
St. Paul, Minn.	J. B. Archer	National
St. Louis, Mo.	Maxwell Motor Sales Co.	Maxwell
St. Louis, Mo.	Neustadt Automobile & Supply Co.	Marion
St. Louis, Mo.	Meyer-Busch Automobile Co.	Speedwell
St. Louis, Mo.	Meyer-Busch Automobile Co.	Brown
St. Paul, Minn.	Fossens-Satterlee-Babcock Co.	Pope-Hartford
Suffolk, Va.	B. E. Parker	Cole
Springfield, Mass.	Bunker-Reopwell Co.	Chevrolet
Springfield, Mass.	Bunker-Reopwell Co.	Little
Springfield, Mass.	Bunker-Reopwell Co.	Rambler
Toledo, O.	Moon Sales Co.	Moon
Wall Lake, Ia.	Hopkins & Herrig	Moon
Wakefield, Neb.	Utecht & Elmer	Moon
Washington, D. C.	David S. Hendrick	Abbott-Detroit
West Point, Neb.	Kirkow & Ickman	Cole
Vancouver, B. C.	A. S. French Auto Co.	Havers
Yankton, S. D.	F. J. Nyberg	Moon

WINNIPEG, MAN.—The Winnipeg garage has removed to its new premises, 263 Edmonton street.

St. Catherines, Ont.—J. M. Lydiatt has opened a garage and accessory depot at 8 Head street.

Detroit, Mich.—F. A. Harris has taken the position of assistant manager of the Hupp Motor Car Co.

Winnipeg, Man.—The Electric Sales and Repair Co. is the name of a new plant recently incorporated to do business in Winnipeg.

Lima, O.—The McLeod & Barr Auto Sales Co. is the name of a new concern which has opened a salesroom to handle the Ford line on West North street, Lima.

San Francisco, Cal.—The Carl Christensen Motor Car Co., distributor of the Detroiter in northern California, has taken new quarters at 561-567 Golden Gate avenue.

Detroit, Mich.—A. S. Holly, former manager of the truck department of the Packard company, has been made manager of the New York branch of the Kelly Motor Truck Co.

Detroit, Mich.—L. W. Place, at one time connected with the Buick sales force and later with the Olds Motor Works in the capacity of assistant to the general manager, has just been appointed foreign representative with the General Motors Co. He will be gone approximately 18 months and during that time will cover a vast amount of territory, visiting every country of note on the eastern hemisphere.

Columbus, O.—The I. J. Cooper Rubber Co. is the name of a new concern located at 263 North Fourth street, which deals in tires.

Boston, Mass.—L. H. P. Lowe, formerly connected with the Thomas B. Jeffery Co. of Boston, handling the Rambler line, has resigned to accept a position as sales manager of the Dodge Motor Vehicle Co.

Green Bay, Wis.—Jones & Indra, 149-151 North Broadway, who erected a large new garage a year ago, have started work on an addition which will double the capacity.

Boston, Mass.—W. H. Stevens, who has the National agency in Boston, has moved from the Autocar building on Beacon street to 1020 Boylston street near Massachusetts avenue.

St. Joseph, Mich.—The St. Joseph Automobile Co. has purchased the interests of the St. Joseph Garage and Auto Livery and has under construction a new fireproof building which will be 64 by 125.

Cleveland, O.—The Abbott Motor Car Co. of Cleveland, O., has been allotted several miles of territory surrounding Cleveland and a large sales organization will push the Detroit car briskly. Temporary quarters have been secured at 2027 Euclid avenue. The officers of the company are: President, W. F. Schmitt, vice-president and general manager, C. H. Davies; secretary and treasurer, J. J. Schmitt.

Columbus, O.—Edward T. Paul, 123 Parsons avenue, has established a vulcanizing and tire repairing shop.

Fresno, Cal.—T. B. Shelton has been appointed manager of the Fresno branch of Don Lee, California distributor of the Cadillac.

Detroit, Mich.—Harold Smith has given up his position as advertising manager of the General Motors Truck Co., Pontiac, entering the Carl M. Green Advertising Agency.

Vancouver, B. C.—Charles E. Smith is completing a garage on First avenue near Commercial drive. It has a frontage of 75 feet and is 22 feet deep. It will accommodate twenty cars.

Philadelphia, Pa.—The local branch of the Firestone Tire and Rubber Co. is now established in new quarters at 304 North Broad street. In the rear, with entrances at 1409 and 1411 Vine street, is a garage.

Cleveland, O.—J. Preston Lyons, formerly Buffalo district manager for the Electric Products Co., manufacturer of automatic charging devices for electric cars, has been appointed district sales manager for Chicago territory. His office hereafter will be at 607 Marquette building. James M. Kelley has been appointed district sales manager, with an office at Buf-

falo, N. Y. John T. Fitzsimmons has been appointed district sales manager in the Cincinnati territory.

San Francisco, Cal.—The Chanslor & Lyon Co. has contracted to handle Lee tire products on the west coast.

Syracuse, N. Y.—A. H. Davis has rejoined the staff of the Franklin Automobile Co. and will act as a special field representative.

Albany, N. Y.—The Albany branch of the Franklin Automobile Co. has been bought by Clarence G. Heck, who will conduct it on the regular Franklin dealership basis.

Phoenix, Ariz.—Local persons have incorporated the Overland Auto Co. and opened a new garage on Third avenue. Overland machines are handled exclusively. A. S. Earhart is manager of the new company.

Springfield, Mass.—Henry F. Blanchard, well known as secretary of the Blanchard Press in Worcester, Mass., has resigned to accept a position in the executive department of the Knox company at Springfield.

Cincinnati, O.—The Price Hill Auto Co., of Cincinnati, O., has filed papers with the secretary of state changing the name to the Radel Auto and Garage Co., and also for increasing its capital stock from $1,000 to $100,000.

San Francisco, Cal.—The Kline Motor Car Corporation has opened a branch in San Francisco. It will be in charge of Frank O. Renstrom & Co., who will act as distributors for California and the coast territory.

Portland, Ore.—W. S. Dulmage has purchased the interests of D. M. Smith in the firm of Dulmage & Smith, and is now sole owner of the Dulmage Auto Co., not incorporated, continuing business at the old location, 46-48 North Twentieth street.

Baltimore, Md.—The Franklin Auto Co., A. J. Miller manager, has outlived its present quarters and will move to larger quarters at 1919 North Charles street after November 1. The new location is now occupied by the D. C. Walker Auto Co.

Boston, Mass.—The Standard Tire and Rubber Co. no longer has the New England business of the Motz Tire and Rubber Co. A direct Boston branch has been opened with M. A. Frank in charge. The branch is located at 4 Dundee street.

Fredricton, N. B.—Willis McPherson is to remove his foundry and machine shop here from St. Mary's. He will open a garage. It may be that a joint stock company will take over the business which is to be carried on on an extensive scale.

San Francisco, Cal.—The Piggins Motor Truck Co. of Racine, Wis., has established a factory branch in San Francisco, to take care of the entire Pacific coast. J. I. McLaughlin is manager. Arrangements are now being made for the erection of a permanent building on Golden Gate avenue. McLaughlin also will be factory representative of the Inter-State in this territory.

Toronto, Ont.—The Ross Motor Car Co., Ltd., is handling Canadian territory for the Regal Motor Car Co., of Detroit.

Vancouver, B. C.—The Kelly-Springfield Tire Co., of New York, has opened a branch office in this city with Harry R. Sayer as manager.

Winnipeg—The Breen Motor Co., Ltd., has been appointed sole distributor for the Cole in the provinces of Manitoba, Saskatchewan, Albert and British Columbia.

Brantford, Ont.—W. P. Blanchard, of Detroit, has been appointed manager of the Keeton Motor Car Co. of this city. Operations will be commenced within a few weeks.

Buffalo, N. Y.—B. F. Morris has been appointed manager of the local factory branch of the Republic Rubber Co., which recently took over the interests of the Bison Rubber Co., its local selling agent.

Hartford, Wis.—Charles H. Lohr and Howard Danielson have leased the Hacker building and remodeled it into a garage and repair shop. The firm has the district agency for the Ford in Dodge and Washington counties.

Amesbury, Mass.—The Walker & Wells Co., maker of bodies, is having completed an addition to its factory on Railroad of a building 40 by 100 square feet, two stories high, to be used for the storage of lumber and metal.

Savannah, Ga.—A branch of the Buick Motor Co.'s factory is to be established in Savannah. J. E. Finney, who has been in charge of the agency for some years, will remain at the head of the concern. Hereafter all the Buick company's business in this section will be handled directly through the local branch.

Savannah, Ga.—Stephen N. Harris, of the Harris Tire Co., has purchased the property on the northwest corner of Drayton and Perry streets, now occupied by the Harris Tire Co. Harris will improve the property and use it as a branch house after he has built his new garage on the property at Bull and Harris streets.

Philadelphia, Pa.—Thomas R. Roberts has resigned the sales managership of the United Motor Philadelphia Co. and formed a co-partnership with Charles M. Reeves to take over the agency for this territory of the Marion car. Under the firm name of Roberts & Reeves headquarters have been established at 1336 Race street.

Toronto, Ont.—A seven-story reinforced concrete garage and sales building is being erected at the corner of Shepherd and Temperance streets by the Central Garage and Supply Co. for the exclusive sale of Abbott-Detroit cars. The building will cost $150,000 and will be ready for occupancy about December 1. There will be a total of 255 feet of display windows facing the two streets on the ground floor. T. S. Blues is president and general manager and Thomas Enright secretary and treasurer.

Detroit, Mich.—The Michigan Steel Castings Co. has increased its capitalization from $60,000 to $90,000.

Cambrose, Alta.—Kennedy, Eltrich & Co. are to occupy a new garage very shortly. This is the building that is being put up on Paulson street here.

San Francisco, Cal.—The Standard Electrique is now represented in northern California by W. T. Stone, successor to R. B. Daggett & Co., formerly agents of the Baker electric.

Baltimore, Md.—A new arrival in Baltimore is the Stutz, which will be handled by the Stutz Sales Co., with headquarters at North avenue and McCulloh street. Walter Scott is manager of the new company.

Lima, O.—W. L. McKenzie and F. W. Holmes have purchased the Electron building at Lima and will erect a large garage in the rear to be leased to a local concern. The garage will be 100 by 50 feet and two stories high.

Toledo, O.—The last of five new buildings to be erected on Madison avenue for the sale of cars and accessories is that of the Six Realty Co., which will extend the Madison avenue row westward. The five structures are either under way at the present time or are in the hands of architects.

Columbus, O.—The Twyman Motor Co., jobber for the Studebaker in Ohio and portions of the states of West Virginia, Kentucky, Pennsylvania and Indiana, has established a branch at 815 Race street, Cincinnati, under the management of L. H. Scarlett. The company has a branch in Dayton, O.

Columbus, O.—C. E. Gwinn, agent for the Lozier and the Davis in central Ohio, has moved his salesroom from 215 North Fourth street to 172 North Fourth street. Amos White, agent for the Everitt and the Flanders electric, formerly located on Mt. Vernon avenue, is also located at 172 North Fourth street.

Indianapolis, Ind.—With an authorized capitalization of $150,000, the Ham-Meix Mfg. Co. has been organized and incorporated in Indianapolis to manufacture self-starters for gasoline motors. Those interested in the company are Harry W. Hamilton, Benjamin F. Meixell, Harold Taylor and Samuel B. Sutphin.

Indianapolis, Ind.—J. R. Zimmerman has been appointed Indianapolis agent and E. M. Holmes Indiana distributor for the Detroiter and Cutting lines. They have established headquarters at 330 North Illinois street. Harry L. Hammond, formerly sales manager for the Archey-Atkins Automobile Co., and F. Ellis Hunter, formerly with the Gibson Automobile Co., have organized the Hunter-Hammond Auto Co. and have established quarters at 517 North

Capitol avenue in Indianapolis. The company will be the Indiana distributor for the Reo.

Brandon, Man.—Dennison Brothers, Seventh street, are putting up a two-story brick garage, 60 by 120 feet.

San Francisco, Cal.—E. A. Shouse has been appointed sales manager of the C. & F. Motor Car Co., northern California distributor of the Stutz car.

Newport, Pa.—A large new garage is being erected by John L. Snyder on Third street. The building will be fireproof, built of cement blocks, with cement floor and steel roof.

Buffalo, N. Y.—The Lippard-Stewart Motor Car Co. of Buffalo has appointed J. R. Elliott district manager for the states of Washington and Idaho and the province of British Columbia.

Syracuse, N. Y.—Malcolm B. Richardson, formerly with the Remy Magneto Co., has been appointed district sales manager in the southern territory for the Franklin Automobile Co. He will make his headquarters at Atlanta, Ga.

Toronto, Ont.—A new company to handle Warner Auto Meters in Europe and Canada has been incorporated under an Ontario charter and will be known as Donald F. Johnston Co., Ltd. Mr. Johnston has gone to Europe with the intention of opening a branch in London.

Detroit, Mich.—F. W. Kurtz has announced his retirement from the position of director of advertising for the General Motors Co., the work and purpose of the advertising department of the General Motors having been accomplished. This department at the general offices has been discontinued, each individual plant now having its own publicity and advertising department.

Detroit, Mich.—The Anderson Electric Car Co. has appointed S. W. Menefee manager of its New York branch.

Montreal, Que.—S. Gagnon, 1924 Boulevard street, Lawrence, Montreal, has been appointed sole agent for the province of Quebec for the Rambler car.

Boston, Mass.—The Lexington Motor Car Co. of New England, which handled the Lexington line with headquarters at 1020 Boylston street, Boston, has gone out of business.

Albany, N. Y.—John B. Hauf, a furniture and carpet dealer, is having constructed a garage and storehouse, dimensions of new building being 110 by 44 feet, the cost to be about $30,000.

San Jose, Cal.—George L. Magneson, a wealthy rancher of this county, has taken the Santa Clara county agency for the Stoddard-Dayton pleasure cars, Baker electric and Federal truck. He will erect a large garage in this city.

Tiffin, O.—Councilman C. A. Jones has purchased the plant of the Ohio Stove Co. on Lafayette street, which will be razed and a modern garage constructed. The firm of Jones & Co. will operate the garage when completed.

Buffalo, N. Y.—Announcement is made of the appointment of two new district managers for the Stewart Motor Corporation, of Buffalo, maker of the Stewart light delivery truck. E. E. Dennison has been appointed district manager for Illinois, eastern Iowa and Missouri, with headquarters at Chicago. W. T. Butler has been appointed district manager for New York state, northern Pennsylvania, with headquarters at Buffalo.

Montreal, Que.—The Cotey Motor Truck Co., Ltd., has been incorporated in Montreal with a capitalization of $400,000.

Phoenix, Ariz.—A Hupmobile distributing agency has been established in Phoenix with J. S. Morrison, formerly of Los Angeles and San Diego, in charge. His territory includes Arizona, New Mexico and the northern part of Old Mexico.

St. Paul, Minn.—A. J. Sarjeant is to manage the new Ford branch in St. Paul. Mr. Sarjeant was in charge of the Northwestern Automobile Agency, which handled the Ford until October 1. The location of the Ford sales department is not announced.

Philadelphia, Pa.—The Wallace Automobile Co., 332 North Broad street, local distributor of the Pope-Hartford, has acquired the agency of the Modern truck for Pennsylvania, New Jersey, Delaware, Maryland, Virginia, North Carolina and South Carolina.

Buffalo, N. Y.—The new building being constructed by the Packard Motor Car Co. at Main and Summer streets will provide for a well appointed sales room, general offices and a service station with complete facilities for inspection and overhauling.

Winnipeg, Man.—The Hart Accumulator Co., of London, Eng., manufacturer of storage batteries, will establish a factory in western Canada. E. J. Clarke, managing director of the company, will recommend that a large plant be built at either Winnipeg or Fort William.

Recent Incorporations

Akron, O.—Akron Welding Co., capital stock, $10,000; to manufacture parts; incorporators, M. W. Smith, G. I. Stuber, E. H. Boyland, D. H. Morgan.

Birmingham, Ala.—Alabama Tire Repairing Co., capital stock, $15,000.

Boston, Mass.—A. W. Cox & Co., capital stock $10,000; directors, N. B. Todd, Charles B. Baldwin, A. W. Cox.

Boston, Mass.—Eliot Motor Car Co., capital stock, $250,000; incorporators, M. H. Libby, R. G. Houston, W. D. Wallace.

Brooklyn, N. Y.—Carlton Garage, capital stock, $5,000; incorporators, J. F. Cox, M. J. Cox, P. H. Fett, K. Fett.

Brooklyn—Brooklyn Auto Top & Supply Co., capital stock, $5,000; incorporators, B. H. Matton, J. Seigel, E. Chinnock, Jr.

Brooklyn—Sea Gate Garage & Automobile Corp., capital stock, $5,000; incorporators, J. F. Curtin, H. O. Coughan, T. K. Malkiby.

Brooklyn—H. J. & S. Co., capital stock, $1,000; to manufacture and deal in rubber articles; incorporators, J. Mattison, H. Jacobson, S. Glass.

Cambridge, N. J.—Hendricks Mfg. Co., capital stock, $250,000; to deal in accessories; incorporators, F. R. Hansell, J. A. MacPeak, F. H. German.

Chicago—National Oil Gas Generator Co., capital stock, $5,000; to manufacture carburetors; incorporators, W. D. Hawk, S. S. Holmes, G. E. Dierssen.

Chicago—Electric Motor Chair Co., capital stock, $50,000; to manufacture motor propelled chairs; incorporators, C. B. Crysler, J. G. Bennett, C. B. Traver.

Chicago—E. C. Demountable Wheel Co., capital stock, $2,500; incorporators, G. A. Oleson, V. G. Kropf, S. S. Gorham.

Chicago—Abbey Auto Livery Co., capital stock, $2,500; general motor car business; incorporators, G. W. Waterman, J. K. Lennox, C. A. Blackwell.

Chicago—Hanway Starter Co., capital stock, $25,000; to manufacture and deal in starting devices; incorporators, J. D. Rourke, I. Goldstein, R. C. Nicholson.

Chicago—Michigan Avenue Garage Co., capital stock, $5,000; to do general motor car livery business; incorporators, E. L. Richter, J. D. Donnell, A. J. Moran.

Farmington, Me.—Metcalf Auto Co., capital stock, $10,000; incorporators, J. C. Metcalf, J. C. Morton, J. W. Barker.

Fort Wayne, Ind.—Eureka Garage Co., capital stock, $10,000; incorporators, T. B. Adams, A. E. Smith, C. H. Buhr.

Gloucester City, N. J.—Auto Tire Repair & Supply Co., capital stock, $100,000; general motor car business; incorporators, J. Michel, T. G. Golden, T. J. Manning.

Houston, Tex.—Motor Transfer Co., capital stock, $3,000; incorporators, A. H. McGowen, Henretta Dixon, J. Wilson.

Milwaukee, Wis.—Archambault Motor Sales Co., capital stock, $25,000; incorporators, W. M. Spooner, L. Quarles.

Milwaukee, Wis.—Milwaukee Tank Works, capital stock, $25,000; to manufacture tanks; incorporators, E. A. Blennenstock, B. F. Salzstein.

Moline, Ill.—Williams-McClean Garage Co., capital stock, $3,000; incorporators, C. H. Williams, W. R. McClean, A. G. Abraham.

Muncie, Ind.—Props-Brooker Motor Co., capital stock, $4,000; directors, J. Cooper, G. J. Brooker, O. P. Dunn, J. Brooker.

Nashville, Tenn.—Southern Zillo Co., capital stock, $100,000; incorporators, W. Hume, Jr., R. Dority, A. B. Foster, W. M. Fry, H. H. Reynolds.

New Orleans, La.—J. A. Landry Motor Car Co., capital stock, $25,000; incorporators, J. A. Landry, J. B. Avergo, R. J. Montrose.

Newark, N. J.—Vanderman & Wainwright Co., capital stock, $100,000; general motor car business; incorporators, F. L. Vanderman, J. S. Wainwright, H. C. Ruckle.

New York—Sternberg Motor Truck Co., capital stock, $25,000; to deal in motor cars; incorporators, E. M. Sternberg, E. P. Herman, B. Sternberg.

New York—Miller-Brisben Co., capital stock, $25,000; to deal in motor cars; incorporators, W. A. Miller, I. Jaffee, J. McNeil.

New York—Stegeman Motor Truck Co., capital stock, $25,000; incorporators, J. G. Anderson, J. G. Smith, J. A. Kent.

New York—Seager's Garage, capital stock, $1,000; incorporators, J. H. Seager, A. Seeley, H. B. Ecerson.

New York—Cahill Auto Works, capital stock, $6,000; incorporators, A. J. Cahill, H. J. Cahill, C. E. Trainer.

New York—Beaver State Motor Co., capital stock, $300,000; to manufacture motor cars; incorporators, P. Combs, J. L. Bailey, G. A. Johnson.

New York—Tuxedo Tire Co., capital stock, $8,000; incorporators, A. Hormann, E. Waltenberg, A. Waltenberg.

New York—Peets-Homan Corp., capital stock, $2,000; to manufacture and sell motors; incorporators, J. A. Bolles, C. S. Peets, F. D. Homan.

Norfolk, Va.—Allen Motor Co., capital stock, $2,000; incorporators, E. J. Allen, E. J. Allen, George Pilcher.

Philadelphia, Pa.—Perfect Tire Sales Co., capital stock, $45,000; incorporators, F. R. Hansell, G. H. B. Martin, S. C. Seymour.

St. Louis, Mo.—Muehling Motor Car Co., capital stock, $5,000; incorporators, F. W. Muehling, G. H. Muehling, G. Blumenthal.

St. Louis, Mo.—Maxwell Motor Sales Co., capital stock, $5,000; incorporators, J. Fillo, B. R. Ford, C. E. Darrow.

Warsaw, Ind.—Warsaw Automobile Co., capital stock, $4,000; directors, W. H. Stanley, John E. Armstrong, A. S. Windsman.

MOTOR AGE

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Contents

DEPARTMENTS

DISK

the longitudinal shaft, the other end of which carries the cam for expanding the brake shoes. Adjustment for wear as well as for applying the braking effort, is provided through two circular flanged faces.

The outer of the two flanges is secured to the shaft by a pin going right through the boss of the flange and through the shaft. The inner flange is integral with the sleeve carrying the skew gear and is secured to the pinned flange by a single bolt. In one flange there are five and in the other six holes; thus by rotating one flange in relation to the other, a very fine adjustment can be obtained. It is an application of the principle commonly applied to magnetos. There is a tendency to put both sets of brakes on the rear wheels, side by side, both being of the internal expanding type. It is also becoming common practice to rib the rear wheel drums. This also applies to the footbrake, which is of the internal expanding type within a ribbed drum. Renault has made this change for the present season. The size of brakes has increased considerably.

Star's Small Car

As an evidence of the trend in Europe and particularly in England toward the small car may be noted the 10-horsepower four-cylinder model which has been added to the Star line for 1913. This new light car makes the third model of the Star series, the other two being the comparatively moderate sizes of 12 and 15 horsepower respectively. The new model is intended to meet the requirements of the large class in England for whom relatively few British cars have been provided and which has formed the greatest selling field for the low-priced American car.

The power plant of the new small car is a unit construction following what has been an increasing tendency in European design. The engine, clutch housing and gearbox are built up as a unit, bolted to the frame by two arms, one on either side of the crank chamber and supported by swinging bolts at the rear end, providing three-point suspension. The four-cylinders are a block casting of the L-type with inclosed valve stems and springs. The motor is of the long-stroke type, its bore being just over 2⅞ inches and its stroke 4⅛ inches. Thermo-syphon water circulation is used for the first time in this company's products. There is a removable water dome above the cylinder. Forced feed lubrication through a hollow crankshaft is employed, the oil reservoir consisting of a large sump at the bottom of the motor. There are no pipes for oil outside the motor as all oil leads are formed in the tank chamber casting. A leather-faced cone clutch and a ball-bearing three-speed gearset and ball-bearing rear axle are the features of the transmission system. The service brake is located on the transmission at the rear of the gearset and the other on the rear wheels. The wheelbase is 98 inches and the tread is the comparatively narrow one of 51 inches. The chassis alone weighs 1,200 pounds.

In spite of the fact that the six-cylinder motor has made little advance in Europe during the past 12 months, like America they have turned to the light six on the continent, going even further in this respect than has been attempted in America. The chief of the light brigade in sixes is the new 13.4-horsepower six-cylinder Loreley car. This is a German product designed to sell in the neighborhood of $1,500, which probably approaches the record for six-cylinder cars. The cylinder dimensions are 2⅝ inches bore by 3⅝ inches stroke, a size which would ordinarily be considered little more than a toy even with six-cylinders. The cylinders are of the L-head type with gear-driven camshaft and the exhaust pressure is employed for fuel feed. The power plant is of unit construction and the motor other than its size follows conventional lines. A three-speed gearset is used which on the direct drive is geared 5 to 1. One of the details of design is the sprag which works on a ratchet on the transmission brake drum. The speedometer drive is arranged by a pulley from the forward end of the propeller shaft.

Austin cars appear for next season in four different chassis models rated at 10, 15 and 18-24 horsepower with four cylinder engines and the 50-horsepower model with a six-cylinder engine. Austin motors are one example as the discontinuance of monoblock construction in favor of the separate-cast cylinders. Originally cylinders were cast separately, then the unit form was tried and later abandoned 1913 cars having the old style of single cylinder casting. Motors are all of the T-head type with twin exhaust manifolds. A feature of the transmission is the external type of cone clutch which has a segmented periphery to obviate the chance of grabbing. Four-speed gearsets are employed on even the 10-horsepower model.

English makers have not been hasty in the matter of electric lighting but the Austin cars appear this year with a dynamo lighting outfit. The armature of the generator is driven from a counter shaft which in turn is driven from the end of the camshaft.

Crossley Unit Power Plant

Crossley cars for 1913 show practically no changes in design from that of the present season. The most popular model is the smallest one rated at 15 horsepower. The power plant in this car is an interesting example of unit system of construction. The engine is four cylinders of monoblock type and the gearset is bolted to a flange on the base chamber by

Nash General Motors' Chief

Head of Buick Company Chosen to Succeed Thomas Neal as President of Big Holding Concern—Old Directors Re-elected at Annual Meeting Held in Jersey City

NEW YORK, Nov. 19—At the meeting of the stockholders of the General Motors Co., held today in Jersey City, all the old directors were re-elected save in the case of C. W. Nash, who was added to the board. The annual report, as already published in Motor Age, was presented.

The directorate consists of the following: Joseph Boyer, Anthony N. Brady, Emery W. Clark, W. C. Durant, Andrew H. Green, Jr., J. H. McClement, Edwin D. Metcalf, M. J. Murphy, C. W. Nash, Thomas Neal, James J. Starrow, Albert Strauss, Nicholas L. Tilney and Jacob Wertheim. The board contains the same representatives of the financial interests that took hold of the company after 1910. It is thought the company will continue its policy of concentration of interests. Already the manufacture of the Elmore and Marquette have been discontinued and it is believed that eventually the General Motors' interests will be confined to four or five pleasure car plants and one devoted to trucks.

Charles W. Nash, who was chosen to a place on the board of directors at today's meeting in place of J. N. Wallace, was elected president of the corporation at the subsequent meeting of the directors. Mr. Nash succeeded W. C. Durant as general manager of the Buick after the reorganization and will continue in that special capacity. Thomas Neal, retiring president, will remain on the board and will continue as head of the finance committee of the corporation.

The various changes signify that the affairs of General Motors are progressing regularly and that the pressing need for a financial and industrial specialist at its head has abated.

Mr. Neal took the office with the understanding that he would be permitted to retire as soon as the business was re-established on a satisfactory basis. The financial report of the company recently issued to stockholders shows that this time is ripe and that the business is in splendid financial condition with a net earning of 17 per cent on the common stock during the last year. In fact, there was general satisfaction expressed over the report by the stockholders who attended the annual meeting.

means of an extension that serves as a housing to partially inclose the flywheel and clutch. The power plant has the three-point suspension, the front support being in the nature of a journal which holds a tubular shaft-like extension of the crank chamber through which projects the starting handle. A tubular member of the main flange which passes through a rigid bracket cast integrally to the gearbox provides the second and third points of suspension. The cylinder size is 3⅛ inches bore by 4¾ inches stroke. The camshaft is driven by a silent chain with an adjustment for tension and timing.

Transmission Brake on Napier

There is little change in the Napier series for the coming season. The two most popular models of this line are in four-cylinder 15 and the six-cylinder 45-horsepower chassis. The 15 is another example of unit construction of power plant, comprising a four-cylinder engine with the flywheel in front and the multiple-disk clutch in the gearset housing. The motor is of the L-head type with 3¼ by 5-inch cylinders. Arrangements are made by which the steering column can be set at any angle desired and the angle of the brake and gearset levers are also adjustable. The European method of carrying the service brake on the transmission is employed in this car. The brake consists of a large steel flange drum attached to the main shaft of the gearset and carrying two projections that form one of the forks of the universal joint. The brakes used are pivoted for 1913 at their centers to suspension levers as in railway practice. A dust shield is fitted to protect the brake and universal and a thumb screw outside the shield provides adjustment. The Napier company is one of the few manufacturers still retaining the steering tie rod in front of the axle instead of its almost universally adopted position behind the latter.

Unit construction of the power plant is carried out in a novel way in the Arrol-Johnston car. These are shown in three models, 11-9 and 15.9-horsepower four-cylinder models, and a six-cylinder model 23.8 horsepower. The chief feature of all three models is the unit construction of the motor and gearset which, however, differs from most of this type by having a common base for the two elements. This base is an aluminum casting which extends from the starting handle to the rear end of the gearset. It is bolted direct to the main frame and assists in stiffening the entire chassis. Four-speed gearsets are provided even in the smallest model.

The feature that attracted the most attention to the Wolseley car is a new engine starter of the compressed-air type designed and made at the Wolseley works. The starter consists of a two-cylinder air pump driven off the transmission countershaft which maintains a pressure of about 300 pounds in a storage tank. When this pressure is reached the pump is thrown out of gear by the driver. From the air tank the compressed air reaches the cylinders through a distributor valve on the forward end of the camshaft. A by-pass is fitted from the main valve for tire inflation or the operation of the pneumatic jack.

Latest in the Talbot line is another small car, this one the 12-horsepower model with cylinders 3⅛ by 4⅛ inches bore and stroke. There is another four-cylinder car of medium size called a 16 and a six-cylinder 20 with cylinders of the same sizes as the 12. A feature of the Talbot chassis is the strength of the frame, the outcome mainly of severe trials in the colonies. The side members of the frame are extra thick and the underframe and several channel cross members give great rigidity. All models are provided with spare wheels and there has been added this year a particularly neat device for carrying them. The wheel rests in a groove in the running board and is held in place there by a light bracket projecting from the gearshift quadrant and passing through the center of the hub to steady it.

Most important among the improvements of the Daimler line is in regard to the lubrication. The Daimler system comprises a system of plunger pumps which draw oil from the sump and four of them force the lubricant up the troughs in the path of the connecting rod ends. These troughs are raised and lowered by opening and closing the throttle. The fifth pump has until now been used to force oil to a sight indicator on the dash board but in the 1913 engine the oil from this plunger is taken to a shelf on the left side of the engine and runs thence by leads to the five main crankshaft bearings. To provide an indicator, an exterior spring plunger is fitted in the oil circuit between the fifth pump and the shelf. Depressing the plunger opens a valve and the oil spurts out

Humber's New Motor

Two newly designed engines are the features of the Humber cars for 1913. These are fitted to the 11-horsepower and 14-horsepower cars. The interesting part in the design of the motor is the casting of inlet and exhaust manifolds in one piece. This casting being bolted on to a side of the monoblock engine casting by eleven bolts; also the lower water pipe elbow is formed as a single casting integral with the timing gear cover plate and fan bracket so that the one piece of metal does treble duty. Exterior piping is, therefore, reduced to a minimum. Another peculiar feature is the frame which is narrow until just behind the front seat where it widens out very perceptibly.

U. S. M. Co. Sale Date Set

Court Signs Order Naming January 8—Formal Bids for One or More of the Six Parcels Will Be Received—Flanders Project Progressing Favorably—No Contract Signed

NEW YORK, Nov. 18—Under decree of the United States district court, the United States Motor Co. will be sold January 8 in New York. Judge Charles M. Hough signed an order to that effect today when the final form of the decree of sale was submitted to him. The changes were of a trifling character.

Under the decree, formal bids for any one or more of the six parcels into which the assets have been divided may be submitted, accompanied by an earnest of good faith in the shape of cash or certified check. The bids thus submitted may be revised upward at the option of the bidder at any time before the closing of the sale at 3 o'clock of the day set.

The action of the creditors appears to be practically unanimous as to the acceptance of the proposed plan of reorganization. On Monday, November 18, 94 per cent of the claims, based upon the total amount, had been filed with the official depositary, the Central Trust Co. It was announced that at least 4 per cent more would probably be filed by December 9, which day has been set as a limit for deposit.

This means that out of a total of over $11,000,000 of claims, the reorganization committee now has all but $660,000, and has prospects of getting the co-operation of about $450,000 before the expiration of the deposit period.

The Flanders project is reported to be progressing favorably, although no official word of its consummation has been given out. The contract has not been signed, but there is a thorough understanding between the parties. This agreement is substantially the contract outlined last week. The precise details have not been disclosed, but it may be said with certainty that the deal is conditioned upon the acceptance of the presidency of the prospective company by Walter E. Flanders as well as the merger of the Flanders company.

It is likely that the situation will be sufficiently developed within 3 weeks to make the official announcement.

The deposits of stock are now estimated at over 47 per cent and according to the prevailing opinion, the total percentage that will come in on the assesment plan will be somewhat more than a majority, considering both issues as a whole.

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Advice for Truck Buyers

"The business man who buys motor trucks should not buy on a basis of free repairs, rather on a basis of no repairs."
"When purchasing a motor truck the buyer should not aim at buying foolish warranties, but legitimate service."

THESE two extracts from an address delivered before the National Association of Automobile Manufacturers at its first annual convention in Detroit last week should be hung up in the memory of every business man who expects to purchase motor trucks within the next 2 years.

THE buyer of motor trucks has been about as much to blame as the truck salesman and the truck maker for many of the regrettable sales of the last few years. The buyer has in not a few instances insisted on life or 7-year guarantee; the buyer has in some cases insisted on the stockholders of the manufacturing company personally underwriting the long guarantee; the buyer has insisted on free repairs covering the life of the truck; and the buyer has insisted on overloading his truck 50 per cent and overspeeding it to nearly the same extent.

IN opposition to this has been the truck maker, who in quite a few cases has accepted such dictation. Many cases can be cited where a branch manager or truck dealer was overpleased at making a demonstration where the would-be purchaser had insisted on a 50 per cent overload and with speeds that would beat those of every other demonstrator. Such a dealer is an equal criminal in this disastrous work of motor truck destruction. But the dealer made the sale, boasted of it and then—well, within a year he was looking for other positions, he had sold his agency to the bankruptcy party and the truck buyer had a sadly ruined machine on his hands: A machine of good caliber but overloaded and overspeeded to an untimely dissolution.

THE truck buyer wants daily to kill the goose that lays the golden eggs. He knows from his sane fellow business man that motor trucks eclipse horse transportation when rationally used and he vainly imagines that the same trucks can be irrationally used. He is right. They can be irrationally used. But why does this business man desire to use them so? Solely because he has the written promise from the truck dealer or maker that he will give him free repairs and he immediately makes up his mind to get all he can out of the truck, knowing full well that it will not cost him anything additional.

THIS is the real yet horrible nightmare condition that not a few truck builders have awakened to find themselves in. They are manacled by a monster of their own breeding and rearing. They have sold their business body and soul through absurd guarantees, guarantees which might be legitimate if the truck owner would be rational, but he has made the purchase to find what is the maximum of the truck capacity, knowing full well that he has free experimental privilege offered to him. Every time a truck maker or truck dealer makes such a bargain with a so-called business man, he is tying a millstone around the neck of his company. Ostrich-like, he may bury his head but the reality remains and the day of reckoning comes closer and closer.

THE business man, who is honest with himself, will not buy motor trucks on such a foolish basis. The broad-minded business executive knows that such business policies are the short cuts to financial suicide. He has had enough experience in other lines of business to know better than to take such disastrous courses. He knows that not a single line of business can be successful unless money is made; and in the same breath he realizes that a truck maker or a truck dealer cannot make money when he gives the buyer his entire commission and in addition makes six-weeks free demonstration, guarantees free repairs, free inspection, free overhauling and many other free-list items. Such wholesale cutting of profits and abnormal guarantees instead of serving to increase confidences destroy them.

A BUSINESS man can better be appealed to on business lines than on cut-price, guarantee arguments. What he wants is truck service and not useless guarantees; what he wants is a well-designed, honestly-made truck, incorporating the best materials and the best design and closest workmanship and not poor materials, questionable designs and poor workmanship with life guarantees and free repairs.

THE truck maker who puts the best engineering design obtainable into his truck; who purchases only the most approved materials; and has nothing but the closest working to limits throughout his factory, cannot afford to give life guarantees and free repairs, neither will he have to give them. On the other hand the maker who for a few short years, or perhaps months at the longest, aims at building up a business on free repairs and life guarantees cannot put the best material, the best design and best workmanship into his trucks.

THIS editorial is for the truck buyer, not the truck dealer or truck manufacturer. It is for the buyer who buys on a business basis, for the buyer who wants to get the most for his company from the fleet of motor trucks or the individual trucks which he purchases. This buyer must remove the bandages from his eyes and stop stumbling over the mote in the dealer's eye and leaving alone the beam in his own eye.

IF he is a business buyer he will not be interested in life guarantees or free repairs, but will be interested in the stability of the organization back of the vehicle; will be interested in the legitimate business policies of the truck maker and also the truck dealer. He will recognize that it is money in his pocket to pay the dealer the list price, that it will be money in his pocket to have that dealer in business and doing well 5 years hence, because he will need more trucks and more advice on trucks. That dealer cannot be in business 5 years hence if he sells on the basis of life guarantees, cut prices and free repairs.

THE business truck buyer must make more of a systematic study of motor transportation than he has in the past. He must not confine his study solely to the truck but to his transportation systems. Is his driver operating at horse-pace or at motor pace? Let him ask himself this question and then turn the spot light upon his own systems and see where he stands.

Many Topics Discussed by N. A. A. M.

Mid-Winter Meeting in Detroit Brings Out Large Attendance—Freight Car Situation Receives Attention—Manufacturers' Contest Association Wound Up—Commercial Vehicle Problems Come Up—Interesting Papers Presented at Different Sessions

By L. V. Spencer

DETROIT, Mich., Nov. 16—Business of importance was transacted at the first mid-winter meeting of the National Association of Automobile Manufacturers which convened in this city at the Pontchartrain hotel on Thursday and Friday.

Of vital interest to the industry was the conference with the railroad men relative to the freight car famine and it is expected that the talks will result in a general improvement of conditions. The demise of the Manufacturers' Contest Association was forecasted by the announcement that the N. A. A. M. is willing to appoint a contest committee to work with the American Automobile Association. The merger of the N. A. A. M. and the Automobile Board of Trade came up in the appointment of a committee to investigate the matter, while the executive committee also transacted important business.

It is doubtful if the association ever held a more successful meeting, in the light of the large number of prominent manufacturers who were present, the fund of valuable knowledge which was imparted, the important business transacted and the results accomplished.

The convention really was officially opened on Wednesday with a meeting in the afternoon of the executive committee of the association, composed of W. E. Metzger, president; S. D. Waldon, W. C. Leland, R. D. Chapin and Hugh Chalmers, Detroit; W. T. White and L. H. Kittredge, Cleveland; Alfred Reeves, New York; H. H. Rice, Indianapolis; G. W. Bennett, Toledo, and S. A. Miles, Chicago. However, it was not until Thursday morning, when the general sessions commenced, that the greater number of the members arrived.

Papers Read Second Day

This second day was taken up with the reading of various authoritative papers and discussions, while in the evening the Detroit members tendered to those from out of town and to other invited guests a most enjoyable banquet in the auditorium of the Pontchartrain. About 250 attended the affair, and in addition to the many interesting speeches a variety of entertainment was provided. A. E. Larned, former president of the Detroit board of commerce, acted as toastmaster, while at the speakers' table were Henry Ford, Hugh Chalmers, W. E. Metzger, H. B. Joy, Thomas Henderson, L. H. Kittredge, R. E. Olds, H. O. Smith, Hal Smith, James Keena, George T. Moody, L. W. Goodenough, J. C. Wetmore, E. B. Boyd, Nat Duke and J. N. Willys.

On Friday morning, several more papers were presented, and in the afternoon an important conference between leading representatives of the railroads and the members brought the actual business of the convention to a close.

A number of the visitors remained over until today in order to visit some of Detroit's many interesting car and parts factories.

The Detroit committee on arrangements for the meeting was composed of William E. Metzger, Flanders Motor Co.; Hugh Chalmers, Chalmers Motor Co.; S. D. Waldon, Packard Motor Car Co.; R. D. Chapin, Hudson Motor Car Co.; W. C. Leland, Cadillac Motor Car Co., and H. W. Ford, secretary Chalmers Motor Co.

Business of the Convention

The first speaker on the program at the opening session on Thursday morning was S. A. Miles, general manager of the National association, who outlined its past work, its present objects and its future. He explained the reasons for holding the convention at this time when manufacturers are not busy with shows. Meetings held during the show season do not furnish the members a suitable opportunity to get together, to know each other and to ascertain what is going on in the association and in the world of motoring, and to get out of the association the full benefit of the advantages it offers.

In his talk, Mr. Miles considered the history of the association for the special benefit of the newer members. The association was organized November 10, 1900, at the first show held in New York. The first executive committee meeting was held on December 3, 1900, and the body was incorporated May 4, 1904. The industry then was a mere dot in the world of commerce. There were about a dozen manufacturers, a few experimenters and a few importers. But these energetic pioneers formed their association at a period of the trade's existence which surprised men in older lines of business.

Mr. Miles traced the trials and tribulations of the National association during the days when the Selden patent was in force. Although the association never had any connection with either the licensed or unlicensed faction, and had in its ranks members of both sides, it was the victim of circumstances and with the formation of the two rival bodies commonly called the licensed and the unlicensed associations, it became a house divided against itself, though it did not fall. Since the reversal of the court decision and the abandonment of the licensed association, the National association has regained much of its former strength, although it is not yet, as it once was, the sole representative of the trade.

Another body, known as the Automobile Board of Trade, has been formed, and much of the work of the two organizations now existing is duplication. It is hoped that the two can be consolidated, as there is much sentiment in that direction at present.

"No matter whether this can be accomplished or not," said Mr. Miles, "the removal of the barrier between the two classes of members and the return of the National association to power was the signal for results which plainly show the inevitable consequences of co-operation.

"Our freight department, backed by the members and the influence of a united industry, became a real power and its value increased ten-fold. Our commercial vehicle committee became so active that its work is among the most important we have done. Our show committee jumped into the breach and headed off threatened opposition in New York. The membership committee became so active that it has added nineteen members to the roll, so that we have now 105 upon the list, by far the greatest number in our history. Our work became once more aggressive and creative. We have done more good in the last 18 months than in the 7 years preceding."

Miles on Good Roads

Mr. Miles touched upon the work of the good roads committee and on the association's co-operation with the A. A. A., the most notable result of which has been the securing of the appointment of a joint committee in congress to take up the policy of federal aid to the good roads movement. The association has been instrumental in the prevention of the passage of freak and discriminatory laws against motorists and in the enactment of state registration statutes.

The general manager further reviewed the work of the traffic department, the co-operation with the Manufacturers' Contest Association, the adoption of standard warranties, truck standardization activities and show work. He closed by saying, "The association, like the trade it represents, is stronger, richer and better than ever before; hence we have reason to believe that we shall continue to be more useful with every new year of our existence."

The general transactions of the conven-

the executive committee; G. C. Diehl, chairman of the good roads committee; S. D. Waldon ,representing the Automobile Board of Trade; C. J. Butler, representing the Motor and Accessory Manufacturers, and myself, representing the National Association of Automobile Manufacturers. Our purpose was to co-ordinate the good roads work of the manufacturers and the users, bringing to bear the enormous influence of the organized body of users.

Federal Aid Conventions

"Through the initiative of the A. A. A. national good roads board, the first federal aid convention ever held in this country took place in Washington in January last. It was a notable gathering, country-wide in the complexion of its attendance, and including men who are leaders in the movement in their respective states.

The concrete result of the convention was a resolution adopted by congress, providing for a joint committee of house and senate to take up the federal aid question in its entirety, and to evolve a concise proposition. This joint committee now consists of five members each from the committee on postoffices and post roads of the two branches of congress. With this committee we shall have much to do from this time on.

"Briefly summarized, the A. A. A. plan is for a comprehensive system of national roads to supplement well organized state systems, which shall include inter-county, market and township roads, with adequate provision for upkeep and a gradually improved form of construction.

Plenty of Work to Do

"The magnitude of the task is at times appalling, but it is a positive fact that from semi-chaotic conditions a definite method of procedure is being evolved. Of course, help of all sorts is being given to the constituent state bodies, which naturally appeal to the national good roads board for advice as to methods of procedure. The A. A. A. national headquarters in New York city have served in great degree as a clearing house for the whole country, and it is worthy of note that four-fifths of this correspondence now has to do with the roads question and the co-related question of touring information.

"An important move which the A. A. A. is considering, and which seems to meet with great approval, is the establishment of additional headquarters at Washington, in order to be in thorough touch with the national legislative situation. The committee appointed on this question will report at the forthcoming annual meeting.

"In the furtherance of state highway development, Good Roads Chairman Diehl has drawn up a model highway law, which is being sent to the governors, and whatever road officials may exist in states where no definite plan of roads improvement has been adopted. This bill is accompanied with the uniform motor law, which has been brought up to date by Legislative Chairman Terry, and the demand for these two pieces of literature is calling for the distribution of several thousand copies in all parts of the country. These measures supply a basic foundation, even the public opinion has not yet been formulated sufficiently to secure their complete acceptance in the form drawn.

"It is almost impossible, within reasonable confines, to give a summary of what has been done, and is in process in this state work. In Maine, for instance, the state association was formed, resulting in an active good roads propaganda. One of the members proposed a plan for capitalizing the car registration fees, and referendum in September brought a four to one favorable vote on a $2,000,000 bond issue. In Idaho, a plan is on foot to secure a similar bond issue on much the same basis. In Montana, the state association is arranging to introduce a model motor law, and a highway bill patterned after the New York law. In Washington, North Carolina, Nevada and Louisiana either arrangements are being made to put through new highway laws where none existed, or an improved and more modern law will be introduced. In New York considerable work was done on the second $50,000,000 appropriation, which

Commercial Car Situation

IN addition to the report of the work of the commercial vehicle committee since the last convention of the association in June, three papers dealing with truck and business vehicle subjects were presented during the course of the Detroit convention. S. D. Waldon, Packard Motor Car Co., considered the relative business in pleasure cars and trucks.

"On every side we hear the prediction that the motor truck business will be the big end of the motor car industry in a few years," said Mr. Waldon. "We get it from newspapers; we get it from bankers, and car manufacturers believe it themselves. Undoubtedly, many car manufacturers, and their agents, too, have begun to look upon the truck as the vehicle which is going to carry the financial load of the pleasure car business.

Truck Business Thriving

"Now, it is well worth while at this time to inquire carefully what justification there is for this prevalent conviction. Is growth in the volume of the truck business not vastly overestimated, and has it not already been more than fully anticipated and discounted by manufacturing preparations?

"A somewhat startling answer to these questions is found by a simple comparison of the present relation of the volume of truck business to passenger car business in the United States and the number of factories engaged in each branch of manufacture.

"Carefully compiled statistics which are very conservative show that 652,000 passenger cars were registered in the various states last year. The same compilation shows that 25,500 commercial vehicles were registered in the same year. On this basis there was one truck to twenty-six pleasure cars.

"The total estimated value of the passenger cars was, in round numbers, $812,000,000 and the total valuation of the trucks was $56,000,000. This makes the proportion of passenger car value to truck value last year approximately 15½ to 1.

"Investigation shows the astonishing fact that there are about an equal number of factories in the country producing passenger cars and commercial cars. The numbers are variously estimated according to the ideas of different enumerators as to what constitutes an active manufacturing concern.

"Probably as good a criterion as any is the number of makers who exhibited their products in each line at last winter's shows at New York and Chicago. There were 111 different manufacturers of pleasure cars in the Garden Palace and Coliseum shows and 101 exhibitors of commercial cars.

"Thus we find that there are nearly as many companies competing for $56,000,000 worth of truck business as there are companies dividing among themselves the bulk of the $812,000,000 worth of passenger car trade. On an average, the truck makers had done a total average business of about $560,000 apiece up to the beginning of this year and the passenger car makers a business of about $7,320,000 apiece.

"State registrations for the first 2 months of 1912 showed 17,126 commercial cars registered as compared with 342,479 passenger cars, or slightly less than 1 to 20.

"There is no desire on my part to belittle the motor truck business, but in giving my personal attention to the work of the commercial vehicle committee of the National association, some of these facts have come home to me with particular force, and it seems that a considerable number of persons have been carried away with enthusiasm over motor truck prospects and embarked in their manufacture without making any study of existing conditions and calculating the prospects of the future.

"The cost of manufacturing and selling trucks is considerably higher proportionately to the volume of business done than the cost of manufacturing and selling passenger cars."

Reports on Committee Work

Mr. Waldon presented reports of the work of the commercial vehicle committee since the June 4 convention of the National association, and of the business transacted at the meeting of this committee on November 6. As a result of its de

we are pleased to say received a favorable vote and was passed at the last election. In Pennsylvania, through co-operation with the state grange, a good roads bill was drawn up, providing for a $50,000,000 bond issue, and this will come before the next session of the Pennsylvania legislature.

Right Material to Use

"The great problem that confronts us all now is what is the right material for a permanent highway. The government has maintained in Washington a bureau of public roads that has been experimenting for years with every road material known. It is the belief of your committee that until we secure the construction of highways that will be permanent in the character of their roadbed, all roads will be much more expensive to maintain than should be the case. We therefore say frankly that in favoring all highway construction, we hope the time is not far distant when the main arteries at least will be of some permanent construction that will need practically no attention for years after being laid. The government can do more to bring about a universal permanent highway construction throughout the country than any other agency. Hence, another reason for our campaign for national highways and federal aid.

"Summarizing our efforts, let me say that we are endeavoring, through the user, to create highway departments in states that have none; to let the motor car owner pay his just proportion of taxes, these taxes to go into the respective highway funds; to secure national aid and federal supervision of the interstate roads, and to hasten as much as we can highway construction in every county in the United States."

The standard warranty which has been adopted by the National association for both pleasure cars and commercials has been quite generally used by the members of the organization, but not unanimously. In this connection, S. A. Miles said: "That the standard warranty is sound has been demonstrated by the fact that we have never heard of a case in which a manufacturer or a dealer suffered serious loss through its use."

To urge its unanimous adoption, A. L. Pope, of the Pope Mfg. Co., Hartford, Conn., prepared a paper entitled, "Why All Manufacturers Should Use the Standard Warranty." This was read by L. H. Kittredge, of the Peerless Motor Car Co., Cleveland. Although advocating the use of the warranty, the paper took the stand that the car maker should not refer so much to the warranty which his product carries as to the service which he can give should anything happen to it. He should not expound so loudly that he will give free repairs, but he should so build his machines that there will be no repairs needed, whether free or not.

Traffic Considerations

Ever since the organization of the traffic department of the National association in 1908—4½ years ago—no event in the movement of motor cars has escaped its attention. Through the efforts of this department most satisfactory results have been obtained in assisting manufacturers, and hence, indirectly, dealers and car owners, to move their cars to their destinations.

One of the most important matters considered was that of freight car service and to cope with this during the coming winter the N. A. A. M. has decided to open a branch traffic department in the city of Detroit, which will be opened by J. S. Marvin, who is head of this department of the association work, at the earliest moment. The work of this department from the Detroit office will cover probably from Buffalo east and will consist in following every freight car filled with motor cars from the time it leaves the various factories in this territory until it reaches its destination, when every effort will be made to get it hurriedly unloaded and immediately returned to the factory. By such a follow-up plan it is hoped that all available cars for motor car shipment will be used to the fullest capacity.

Reported by S. D. Waldon

liberations the association revised the scale of minimum body weight allowances based on stake types, as adopted at the March meeting of the association. The revised schedule representing approximate averages of weight of all types of bodies commonly fitted to chassis of the different capacities follows:

Load Capacity, Pounds	New Body Weight Allowance, Pounds	Former Body Weight Allowance, Pounds
1,000	600	500
1,500	750	....
2,000	900	600
2,500	1,000	....
3,000	1,050	700
4,000	1,200	800
5,000	1,350	900
6,000	1,500	1,000
7,000	1,600	1,100
8,000	1,700	1,200
9,000	1,750	1,300
10,000	1,800	1,400
12,000	1,900	1,600
14,000	2,000	1,800
16,000	2,100	2,000
18,000	2,200	2,200
20,000	2,300	2,400

Demonstration Charges

The scale of demonstration charges for commercial vehicles which was adopted at the June meeting of the National association was lowered. This was done because it was deemed desirable that the charges should bear a close relation to the actual normal cost of operation of the vehicles and that the rate per ton mile of work done should decrease as the capacity of the unit decreases. The new schedule is:

Truck Capacity, Tons	Approximate Average Cost Per Day	New Scale of Demonstration Charges Per Day	Former Scale of Demonstration Charges Per Day
½	$ 8.50	$10.00	$10.00
1	9.50	10.00	10.00
1½	10.50	11.50	....
2	11.50	13.00	15.00
2½	12.25	14.00	....
3	13.00	15.00	20.00
3½	14.00	16.00	....
4	15.00	17.00	25.00
4½	15.50	18.00	....
5	16.50	19.00	30.00
6	17.25	20.50	30.00
7	17.75	22.00	35.00
8	18.25	23.00	35.00
9	18.50	24.00	40.00
10		25.00	40.00

Efforts made to ascertain the extent to which the standard truck warranty recommended by the National association has been adopted by manufacturers have brought forth replies from sixty-four makers. Sixteen members and eighteen non-members have reported their definite adoption of the warranty and their intention to incorporate it in their new catalogs when issued. Nine other member companies and one non-member are in favor of the standard warranty and report that when they are manufacturing commercial cars on a sufficiently large scale to require a truck warranty they will probably adopt this one. Seven non-members favor the warranty and say they will adopt it if a majority of the makers do so. Three members and one non-member report that they have the question under consideration. Opposition was found in only nine cases.

With a view to rendering truck bodies more readily interchangeable between different makes of trucks of the same capacity rating, and to enable the body builder to make up stock bodies that can be mounted on any make of chassis on demand, the committee collected a large amount of data from truck manufacturers and from an analysis of this data recommended two standard frame widths, which were adopted by the association. These frame widths are 36 and 42 inches and frame lengths, also adopted, for distances back of the seat are in multiples of half feet, from 48 inches for the lightest packages delivery car to 216 inches for the largest sizes of trucks. The committee's idea in making frames in multiples of the foot and half-foot lengths is so that the number of frame lengths in common use on trucks of 1, 1½, 2, 3 and 5-ton trucks can be reduced to fifteen sizes to meet all ordinary requirements even with short, medium and long wheel bases in each capacity. These would be made in half foot lengths from 8 feet to 15 feet. However, ten sizes from 9 to 14 feet will take care of all ordinary requirements.

Standard Frame Lengths

These frame lengths can be made up to fit the two widths of frames—36 and 42 inches—and in any of the standard types of bodies desired. If these recommendations are adhered to by a majority of the truck manufacturers, it will make the problem of supplying bodies much simpler for the maker of this part of the completed vehicle.

It developed in the discussion between the motor car manufacturers and the freight representatives of the various railroads who attended the conference at the request of the manufacturers, that the shortage of cars often was due to carelessness on the part of the car manufacturer as well as neglect on the part of the railroads. It developed that motor car manufacturers not infrequently get freight cars delivered to their factory shipping platforms and hold them 3 or 4 days and perhaps longer before making a shipment. The railroad companies in Detroit by investigation discovered this abuse. Loss of time in this way is equally as disastrous as delays on the part of the railroad company holding the empty cars at the point of delivery after the dealer has taken the vehicles out of them. But the railroad freight representatives announced that their respective roads are doing much to relieve the situation by new cars, some of the companies having recently placed orders for as many as 500 new ones.

Conference with Railroad Men

The railroad representatives who were present at the conference were A. B. Atwater, assistant to the president, Grand Trunk Railway System and general manager of the lines in the United States; E. B. Boyd, assistant vice-president, Missouri Pacific Railroad and the Soo Lines; G. C. Conn, vice-president and traffic manager, Pere Marquette Railroad Co.; J. S. Bartle, assistant traffic manager, Achison, Topeka and Santa Fe Railroad Co.; Nat Duke, assistant traffic manager, Delaware, Lackawanna and Western Railroad Co., and W. C. Rowley, general freight agent, Michigan Central Railroad Co.

In speaking on the subject of traffic as it applies to the National association, Mr. Marvin outlined the workings of the traffic departments of the large industrial concerns as a comparison. He placed the amount of freight earned by the railroads of the country on shipments of motor cars from all factories at not less than $6,000,000 per year, and explained how this expenditure should be supervised.

"The question of service," said Mr. Marvin, "is of vital importance to the industry. When the railroads fail to operate on accustomed schedules or when they are unable to keep pace with the manufacturer of any article within reasonable limits in the supply of freight cars, the situation is about as serious as could be imagined. The conversion of finished goods into cash is interrupted.

"When industries in general find it difficult to secure sufficient freight cars, the situation is rendered all the more difficult for the motor car factories, for when a car shortage occurs, shippers of other articles gain the use to a large extent of the motor car cars.

"Such a car shortage exists in this country today; the railroads are right now taxed to the limits of their resources in handling the exceptionally large crops and a heavy movement of traffic of all kinds. One of these periods exists at this time when the return of freight cars to the home roads is difficult of enforcement, and when it is considered that the observance of this rule is all that the motor car industry has to depend upon for the shipment of its goods, the real aspect of the situation confronting us is apparent. To shippers of other articles which can be loaded in ordinary box cars it does not matter so much if the car which they load is owned by the railroad furnishing it to them; but the motor car shipper hasn't this choice and must in the main depend upon the outlying railroads returning the initial line's motor car cars."

In connection with the consideration of truck matters, an address was delivered by M. L. Pulcher, Federal Motor Truck Co., Detroit, on the subject of the injudicious truck selling methods and their effect.

"The necessity for disposing of the product in order to realize on it and devote the money to payment of accounts," said Mr. Pulcher, "and the continuance of manufacture is the root of numerous evils in the selling end of the business. There are two principal kinds, one originating with the factory and the other with the sales force.

"The executives at the factory probably believe that theirs is the best truck built of its rated capacity and price and they cannot see why the salesman should have any difficulty in selling it; consequently they press the sales force.

"The first result of such factory policies is to realize the object—quick sales. If there were no other and adverse results such would become common practice, but the fact is, they are going out of favor both with the truck maker and the public.

Selling Methods of Truck Makers

"The selling of trucks is not very different from the selling of other machinery, and it should be done on the same sound basis, that there is such a thing as selling service on a safe and profitable basis, is shown by the fact that some of our reliable factories, through their selling organization, rent trucks by the month or the year at a price which makes a profit for them in this branch of the business.

Mr. Pulcher took up the methods of sales from the salesman's end, discussing the fallacies of price cutting and the various ways of arriving at charges for demonstration. The common fault of knocking the other fellow's product in order to make sales was discouraged.

David Beecroft, editor of Motor Age and the Automobile, discussed a subject of vital interest to motor truck manufacturers, in that he showed the situation with which the commercial vehicle manufacturer must cope and must remedy in order to make his product show up to its best advantage. Mr. Beecroft's subject was "Transportation Delays at City Railroad and Dock Terminals."

The subject of yearly models was brought up for discussion at this convention of the association, the principal speaker on the topic being H. O. Smith, Premier Motor Mfg. Co., Indianapolis, Ind. Mr. Smith's address was entitled "Yearly Models." He took a firm stand against yearly models and attributed many of the present ills of the industry to the annual model. He described the annual series or models as a barnacle that has fastened itself upon the industry. Among the various injuries worked by the annual model is that of factory expense, in that each annual model incorporating changes means the abandoning of jigs, tools and other equipment. There also is a factory loss in production because the workmen in the factory will have grown familiar with the production of the previous model produce at a lower capacity during the time required to familiarize themselves with the new job.

Yearly Models Discussed

"I am not sure that any particular changes made from year to year make new buyers, an exception, however, being the addition of such an accessory as self starters," he said. "How many of the 999,000 owners in the United States today purchase their first car because it was one of the latest models?"

One of the ills of the annual model is the early announcement, an example being a concern announcing in April, 1912, its 1913 model. This announcement being made before some of the Iowa dealers had a chance to even demonstrate their 1912 models to the buyers. These announcements merely serve as signals to the buying public to stop buying 1912 models and wait until the full complement of 1913 models have been announced.

Yearly models cause unrest in factories. There always is a hurry, a hurry to complete the last of the old models; a hurry in the tool room to get the jigs and tools ready for the new models; and other hurries. The annual models can be charged with a second-hand car evil which has loaded itself on the industry.

Mr. Smith concluded his paper by establishing the fact that the new annual models or series does not actually create new business.

Following this paper one of the most heated discussions of the entire conference took place. The makers ranged themselves on both sides. Those who talked in favor of the annual model advanced the argument of style as a selling factor, whereas those opposed to the annual model centered their arguments around service rather than style.

On the topic of motor car selling, the manufacturers heard two able papers, one by Hugh Chalmers, Chalmers Motor Co., Detroit, who attacked the selling problem with which the car maker of today is confronted, and the other by E. R. Benson, Studebaker Corporation, Detroit, on territory and discounts.

"Our selling problem," said Mr. Chalmers, "may be roughly divided into two

classes—first, those the solution of which can best be accomplished by the manufacturers as a whole working together; second, those in the solution of which each company must go its own way and find its own best methods. It is the first class, very naturally, that we should consider here.

"We are led to the first problem worth our while to consider by the question, What is selling? What constitutes a sale?

"It seems to me that selling—selling a motor car, for instance—is something more than simply exchanging a motor car for a check or for so much cash. This may be merely a friendly transaction; or an exchange, fair or unfair, or perhaps a bit of charity or philanthropy. Selling, real selling, is the disposal of goods at a profit. Anybody can give goods away, but selling things at a profit is a job for good salesmen and good business men. Let us keep this point in mind

"Now, gentlemen, business exists for the net. It is a nice enough thing for those who like it to build up a great volume of gross business merely for the sake of talking about it, but the final test of success is in the net figures. The prime object for which we are all working, therefore, is to make money.

"Most of us do business through dealers, and most of us doubtless will continue to do business that way, in large part at least, for a long time to come. The dealer, then, and some of his problems represent our first big problem. It seems to me that car dealers are of more vital importance to both the manufacturer and the buyer than is the dealer in nearly any other line of business. The right sort of car dealer is harder to get than a good dealer in other lines—that is why he is so vital to the manufacturer. And, again, a car dealer is needed more by the buyer after the purchase than is the dealer in any other line—that is the public's vital interest. Both the manufacturer and buyer, therefore, are anxious to have a good dealer and to have him remain so. A good dealer won't remain good very long unless he can make some money; unless his business will show a net profit. Either he will get out of the business, or he will simply drift along for a time, only to fail entirely in the end."

Effects of Over-Production

Mr. Chalmers pointed out how overproduction affects sales, how second-hand cars, weather, good roads and honest advertising have a good or bad influence on the number of cars disposed of.

Inasmuch as the apportionment of territory and the discount to be allowed the agents are much mooted questions, Mr. Benson's talk was very timely.

"Territory in one sense," he said, "is the capital of the sales manager, inasmuch as out of it he has to obtain his results. The subject of territory, therefore, the man's continually the deepest study and research; it demands that we should all have ready the best sources of information and the latest data to draw from; that we should have on hand statistics on population and wealth; late reports on manufacturing and other industries; reports on crops, on mercantile conditions, on the status of the markets of the country, as well as continual reports from our own traveling representatives, analyzing conditions from their points of view.

"Before the manufacturers let contracts for territory they should know all there is to know about them; about their ability as salesmen; their financial status; how they are regarded in the communities in which they live and so on," according to Mr. Benson.

He states that discounts must necessarily be considered in conjunction with territory, as it is also a part of the capital which is handed to the sales manager on which to promote business; consequently, discounts must essentially be viewed from many angles, such as those given to the large distributor who acts more or less as a jobber and controls a large territory; the regular dealer, who does not have such a large territory; and the sub-dealer who has a very small territory.

E. R. Benson on Territory Division

Mr. Benson believes that the discounts and divisions of territory, no matter to which class given, should all be controlled, systematized and agreed to by the manufacturer in order to insure his procuring the most out of the territory. He took up the consideration of the bonus or rebate plan and the system of graduated discounts by which the dealer commences at one rate and gets a greater discount in proportion to the amount of business he does.

To the manufacturing branch of the industry the address by G. W. Bennett, Willys-Overland Co., Toledo, O., on the multiplicity of models belongs. Mr. Bennett advocated the concentration upon a small number of models, since the marked successes of the motor industry will in the future lie in specializing, each plant making that which best fits its demands, and producing that model in the quantities to which its place in the motor market entitles it.

To make several models in a factory which is equipped to make not more than one satisfactorily, necessarily restricts the output of that plant and divides the energies of its engineers, its operative force and its selling force into several small channels, all of them considerably below par in efficiency because of such division.

"The growth of the industry shows," said Mr. Bennett, "that the most prominent manufacturers have realized this and are catering to the class of demand which they can best supply. I believe that this development will become more marked, and that in a very few years each factory will limit its product to one model with perhaps several styles of bodies interchangeable on the chassis.

"It may not always be possible for one manufacturer to profitably restrict himself to one chassis, but it will be possible, if more than one is considered necessary, to make a large number of the parts interchangeable, and only in this event would the production of two models be warranted.

"Furthermore, the subject of subsequent service is involved so much that where more than one model is built, adequate service to the user is difficult and consequently seldom satisfactory, and without that satisfaction, complete success is impossible."

Mr. Bennett pointed out that since the interests of the dealer are identical with those of the manufacturer, concentration of the manufacturer on a single model allows the dealer to focus his attention to this same single type, with his consequent better acquaintance with it and the methods necessary to sell it.

John C. Wetmore, dean of motor writers, went straight to the point in his talk at the N. A. A. M. meeting late Thursday afternoon, using as his subject "Contests as an Aid to the Motor Industry." Mr. Wetmore bore down heavily on the necessity of contests as an aid to the industry and congratulated the N. A. A. M. upon its having taken over the contest side of the industry on the occasion of the demise of the Manufacturers' Contest Association which had previously worked in conjunction with the A. A. A. contest board.

Mr. Wetmore pointed to the fact that practically every one of the successful manufacturers of today gained his first successes through victories on road, track, hill and in a touring contest. He stated it as his opinion that the manufacturers must provide contests to make the news to enable the newspapers of the country to continue the generous treatment now given news of the industry and stated that unless the makers came forward more liberally with entries for contests they would soon find themselves barred practically from the news columns of the country.

Need of Publicity

Mr. Wetmore said that from one end of the country to the other there was a war today against the amount of space given to motoring and he advised that the N. A. A. M. recommend to the A. A. A. the reclassification of great racing events and segregation of great classics for every class of cars, giving it as the opinion of the newspaper men that greater good would be done the industry by having the great events of the year each a star event in one locality instead of grouping many great events as at present.

He advocated the formation of local promoting associations such as New York has formed to promote track races, road races, hill-climbs, touring events, exhibitions, orphans' day outings and so on, these events being promoted by a stock company composed of all dealers, with 50 per cent of the profits to a sinking fund to cover possible future losses.

New Equity Rules for Patent Cases

PATENT litigation, and in fact recourse to the courts of equity on broader lines, has become so extremely expensive through the cumbersome system in effect that litigants without long purses and the ability to wait have been at a real disadvantage. Therefore, the supreme court of the United States has just issued a new set of equity rules that is pronounced by the bar to be the most revolutionary document of the American republic since the emancipation proclamation.

The operation of the new rules will serve to shorten patent litigation fully 50 per cent on the average and will reduce the costs to a mere fraction of what has been usual. Under the new rules, according to William A. Redding, chief patent counsel for the Automobile Board of Trade, the great Selden suit could have been disposed of in 6 months instead of 5 years and that the testimony that filled thirty-six volumes at a minimum cost of $1 a page for publication alone, could have been contained in one volume.

The new rules number eighty-one. Patent procedure under them will be reduced, as briefly outlined below.

Upon the actual filing of the bill of complaint, the clerk shall issue the process of subpoena thereon. There is notice contained in the subpoena that the defendant shall file his answer in court, on or before the expiration of 20 days after service. If service is accomplished and the answer is not filed, the complainant is entitled to a decree pro confesso.

Final decree may be entered at any time after 30 days subsequent to default.

Save where the existing statutes provide for certain technical forms of pleading, all such technical forms are abolished in equity. As to amendments the rules state that the court, at every stage of the proceeding must disregard any error or defect in the proceeding which does not affect the substantial rights of the parties.

Exceptions to bills of complaint for scandal, impertinence or redundance are barred but the court upon its own initiative or upon motion may strike out such extraneous matter upon its own terms.

Lack of equity has always been a standard plea, where entirely aside from the facts and law involved, the party advancing that plea wished to be given more time. The usual procedure was to allow that while the opposite party might have an action at law, the facts showed that the suit should have been brought on the law side rather than in equity.

The supreme court adjusts this difficulty by providing for the peremptory transfer of cases brought in equity that should have been brought in law and orders that only essential changes shall be made in the forms of pleadings and provides that matters ordinarily determinable in law, incident to a suit in equity, shall be determined according to the principles applicable to the case without sending it to the law side of the court.

This might seem to the layman to be an unimportant detail, but the facts of the case are that this rule may prevent delays of as much as a year in a given suit and expenses running into real money.

The form of the bill of complaint is much simplified. The new form will have five sections; the caption, brief statement to give the court jurisdiction; the facts relied upon by the plaintiff, omitting all matters of evidence; exceptions in joinder in the action and a prayer for relief.

Under rule 29, demurrers and pleas are abolished. This means that one of the chief sources of delay in equity is eliminated. All the defenses that are now presented by way of demurrer or plea must be included in the answer instead of being pleaded in succession at intervals of at least 30 days. The effect of the rule will be to make the draughting of bills of complaint much more careful because some technical mistake might lead to the dismissal of the suit by reason of demurrable fault.

United States Supreme Court Frames Regulations to Shorten Legislation

The rule provides for hearing of motions to dismiss on the part of the defendant but specifies that if the motion is not successful, answer must be filed in 5 days on pain of a decree pro confesso.

The issue is joined on the defendant's answer, which must be short, omitting matters of evidence. The answer may state as many defenses as are deemed essential, regardless of consistency. General denials must be avoided. Averments except as to value, if not denied shall be deemed confessed. Matter that heretofore has been used as the basis of cross-bills, must be pleaded in the answer. Unless some counterclaim is set up in the answer, no further pleadings are required. If such counterclaim is alleged, the plaintiff must reply to it within 10 days.

Exceptions for insufficiency of an answer are abolished, thus eliminating another source of delay. Such objections in the future will be handled as part of the suit itself.

The most important change is the substance of rule 46, which reads:

"In all trials in equity the testimony of witnesses shall be taken orally in open court, except as otherwise provided by statute or these rules. The court shall pass upon the admissibility of all evidence offered as in actions at law. When evidence is offered and excluded, and the party against whom the ruling is made excepts thereto at the time, the court shall take and report so much thereof, or make such statement respecting it, as will clearly show the character of the evidence, the form in which it was offered, the objection made, the ruling and the exception. If the appellate court shall be of the opinion that the evidence should have been admitted, it shall not reverse the decree unless it be clearly of the opinion that material prejudice will result from an affirmance, in which event it shall direct such further steps as justice may require."

Where depositions are allowed in exceptional cases or ordered by statute in patent cases, those of the plaintiff must be filed in 40 days; those of the defense in 20 days more and rebutting depositions within 15 days thereafter. Cross examinations are ordered to be held in open court where the opposite party desires such a right.

When the time for taking depositions has expired, the case goes on the calendar automatically. Postponement of the hearing may be had on application of counsel, but the adjournment of the hearing may not go beyond the end of the trial term.

Save in matters of accounting, reference to masters in chancery shall be the exception and not the rule.

The form of decrees is much shortened and simplified, the supreme court ruling that the pleadings, reports of masters and other prior proceedings shall not be recited.

On appeal to the United States circuit court of appeals, the rules require brevity and relevance on pain of having the costs of irrelevant and redundant matter taxed against the party at fault in order to discourage such practice. The rule places the attorneys within its scope and the court is ordered to issue rules against offending members of the bar even when their clients are not held to be amenable.

The old rules of equity are abrogated and the new set effective as of February 1, 1913.

The rule as to the taking of testimony in open court; the omission of printing voluminous records and the simplification of appeal procedure will undoubtedly save millions of dollars a year to litigants.

Under the new rules, the owner of a patent, enters suit against an alleged infringer. He files his bill; subpoena issues and service is had. This may occupy a day or a week, rarely the latter. When 20 days has expired, the defendant must answer and the suit will be at issue. In patent cases the plaintiff has 40 days to file depositions; the defendant 20 days to answer with another contingent delay of 15 days where rebutting depositions are required. The case is then ready for trial and may be heard within 30 days after the time for filing depositions has expired. The operation of the new rules would seem to limit a patent action wherein there are no unusual features to 125 days from the time of filing until the trial. In many instances it would appear that cases might be finally heard in 50 days and that 6 months would be about the maximum limit unless something exceptional developed.

Under the present rules, the answer may be reached in 80 days after the filing of suit, but it may be delayed almost indefinitely by the interposition of dilatory pleas, demurrers and other pleadings upon which issue of the merits of the case can not be joined. The taking of testimony may occupy almost any reasonable amount of time and the rebuttal testimony may still further delay the hearing. The witness to be examined gives his testimony before a master who has no discretion as to its admissability. He must transcribe it for the court's use and it becomes a part of the record. As such it is printed at high cost.

The testimony put up to the trial judge is generally an appalling mass. If he is to do his full duty he is obliged to wade through reams of inconsequential stuff. When he has heard the arguments, he must take the briefs of opposing counsel and the testimony of both sides and mull them over until the equity involved becomes clear to his mind.

For that reason alone many cases are reversed in the upper court. There are so many irrevelant documents imposed upon the court and such a terrific mass of conflicting data is developed at the ordinary trial of even the simplest patent litigation that the chance of disordered proportion is always present.

It is almost axiomatic that skillful counsel can delay action in a patent case almost indefinitely, but such will not be the case under the new rules. The limits are clearly defined and in future it will be a remarkable patent case indeed that will linger in the courts pending a hearing for so much as 1 year.

Of course, the new equity rules will not affect the operation of the patent office. That must be done by federal statute. The Oldfield revision of the patent laws died an unmourned death when the late session of congress adjourned. The measure may be revived next fall but those nearest to the project are least optimistic.

GRABOWSKY AFFAIRS

Detroit, Mich., Nov. 19—Despite any statements to the contrary, the Grabowsky Power Wagon Co. has not yet been adjudicated a bankrupt, although a petition recently filed by several of the creditors of the concern in the federal court in Detroit probably will result in such action. Judge Tuttle appointed the Federal Truck Co. receiver, but until the plant has been inventoried and appraised, it will be impossible for the court to act.

It is the intention of the receiver to conduct the business temporarily and in the event the court orders a sale it is hoped that it can be made with the business as a growing one. This order should be given the latter part of this week. Several concerns have shown an interest in the matter and are preparing to make a bid on the business.

Rumor has it that the Alco people have an eye on the proposition and in other quarters it is stated that the General Motors Co. is also looking it over. It is impossible to verify these reports.

GERMANS BUY OUT HENRY HESS

Philadelphia, Pa., Nov. 19—Henry Hess has resigned as president of the Hess-Bright Mfg. Co., his interests in the big ball-bearing concern having been purchased by the Deutsche Waffen-und Munitions Fabriken, or the DWF as it is more familiarly known. The new German owners held a meeting this afternoon, after which it was announced there will be no change of policy. M. Bright will be the new president, while A. T. Brugel becomes secretary and C. L. McCalla treasurer.

Many Seeking a National Bill of Lading

Chicago Association of Commerce Takes Action in the Matter

CHICAGO, Nov. 13—Energetic action on the national bill of lading measure now pending in congress is promised in local business circles as a result of the interest aroused in favor of it at the weekly meeting today of the Chicago Association of Commerce. This association is largely the mouthpiece of Chicago commercial interests and the motor car industry is well represented in it.

The national bill of lading measure is what is known as the Pomerene bill and was passed by the senate during the last session of congress. It has not been reported out of committee to the house but is expected to come up for consideration by the house during the next session. The measure is designed to correct the present confusion in regard to the actual status of bills of lading as security for drafts on the shipments which they represent.

Inasmuch as bills of lading are employed extensively by motor car makers and their agents as collateral for borrowing money before the shipments of cars are delivered, it is of considerable moment to them that the status of such instruments be clearly defined. The evils of the present situation as regards bills of lading were brought out forcibly by Clay H. Hollister, chairman committee on bills of lading, American Bankers' Association, who spoke on the "Present Status of the Bill of Lading Situation" in congress, and John F. Hagey of the First National Bank of Chicago, whose topic was "Bills of Lading as Collateral."

It developed from the talks of these two speakers that great confusion exists as to the exact legal status of the bill of lading as negotiable paper. The chief difficulty seems to be that in most states the railroad cannot be held responsible for the delivery of the complete bill of goods specified in its bill of lading, the only case in which an agent is not responsible for the goods handled by it. When the bill of lading is accepted as collateral security for a loan or transferred in any other way as negotiable paper, payment on it will be refused if the entire shipment specified has not been received. Naturally, the transporting agent, usually a railroad, would be expected to be responsible for the difference, but though in ten states there are laws to that effect and the courts of others have so ruled the United States supreme court holds that the railroad cannot be held responsible for the error of an agent in making out the bill. Consequently the loss falls on the innocent third party, usually a bank. Similar difficulties are encountered when duplicate bills of lading are issued or complete bills on incomplete shipments.

This confusion has caused the banks to become very chary about lending money on these instruments, where such loans are made, the banks basing their reliance more on their knowledge of the integrety of the borrower than on the validity of the instrument. The purpose of the proposed legislation is to make the bill of lading nationally worth as collateral, the amount specified on its face. It is expected that great pressure will be brought to bear on the next congress to get the measure made a law as early in the session as possible.

OHIO DENIES BANKRUPTCY

Cincinnati, O., Nov. 19—The Ohio Motor Car Co., against which the Eisenman Magneto Co. and other creditors brought proceedings in involuntary bankruptcy, a few weeks ago, has filed its answer denying that it is insolvent or that it has committed any act of bankruptcy as charged. A demand is made for a hearing before a jury. President C. F. Pratt, upon the authority of the board of directors, made the answer. Great efforts are being made to reinforce the Carthage plant. It is thought that the bankruptcy matter will be cleaned up the same as it was 2 years ago. According to a rumor, West Virginia capitalists have offered $600,000 for the plant.

WARREN CREDITORS MEET

Detroit, Mich., Nov. 20—Special telegram—At the request of the directors of the Warren Motor Car Co. creditors and officers of the company held a joint conference at the Pontchartrain hotel yesterday, at which it was decided to extend all notes and other obligations until about June 1. Creditors were unanimous in their opinion that the Warren company is in healthy enough condition to continue business. On November 12 another joint meeting was held at which the exact condition of the company's affairs was gone over. The liquid assets are about $375,000 under the new arrangements, while liabilities total $350,000, of which $50,000 is a stationary liability against the plant, leaving sufficient margin for conducting the business.

Although the plant has not been operated at its full capacity of late it is expected that within 2 weeks it will be turning out its maximum output again. Cars to take care of 2 months' business are ready for shipment at once, while the entire 1913 output of 1,500 machines has been sold, which will take care of the business up to July 1 of next year. The various models will be continued as planned.

At its meeting six were added to the directorate from among the creditors. The enlarged board is made up as follows: Harry Bassett, Weston-Mott Co.; H. J. Mallory, Weston-Mott Co.; F. H. Lewis, Lewis Spring and Axle Co.; M. R. Jencks, Port Huron Engine Co.; J. W. Mowe, Firestone Tire and Rubber Co.; G. Jahn, Bosch Magneto Co.; Homer Warren, C. R. Wilson and C. H. Wilson. The three last named are of the old board.

On Thursday afternoon, November 21, a meeting of the directors will be held, at which the resignation of several of the present officers will be accepted and new ones elected.

KING COMPANY'S PLANS

Detroit, Mich., Nov. 16—Following the visit of Artemus Ward to this city to look over his recently acquired property, the King Motor Car Co. which he purchased for $40,000, it is announced that the reorganized concern will be a close corporation, all of its stock to be held by Mr. Ward and those actively engaged with him in the enterprise.

Artemus Ward, Jr., only son of the new owner of the King interests will spend much of his time here in the interests of his father. The former is to be president of the company. The personnel of the concern in addition to Mr. Ward is: J. G. Bayerline, manager; T. A. Bollinger, factory manager; T. P. Chase, engineer; J. B. Siegfried, purchasing agent; W. L. Daly, sales manager; J. Mohardt, superintendent; F. A. Vollbrecht, chief accountant and George Gurney, manager service department.

The present line of four-cylinder cars will be continued, in addition to which another model will soon be placed on the market. This latter machine is really the one which Mr. Bayerline, who was formerly connected with the Warren Motor Car Co., built last summer. It was designed by Mr. Chase under direction of Mr. Bayerline.

ATLANTA HAS BIG SHOW

Atlanta, Ga., Nov. 16—The Atlanta show was opened tonight. There were thirty-two branches and agencies exhibiting cars and accessories. The exhibit was divided as follows: Gasoline pleasure cars, seventy-eight; electrics, seven; commercial cars, six; polished chassis, four; accessory exhibits, eight; oil exhibits, one, and motor cycles, five.

Judged by the standard of southern exhibits, it was rather the most notable the south has ever known, barring the one ill-starred national show. For one thing stage, by tearing out the wings of the considerably more space was available than last year, 30,000 square feet as against 19,080 in which 1912 cars were shown. This increase of space in the local Auditorium-Armory was accomplished by raising the floor to the level of the stage and by utilizing to the fullest extent the space under the seat banks.

The Readers

Why Steam Engine Needs No Gearset—Makers of Parts of Indianapolis Car—Reader Recounts Exciting Experience with Car That Overheated with a Thin Mixture

Flexibility of Engines

Compensation for Loads As Cared for By Steam and Gas Power Installations

LA GRANGE, Mo.—Editor Motor Age—Kindly explain the meaning of a floating axle. Is it correct to say the floating axle carries the housing to the full end of the hub at its outer point? Is the Ford a floating or semi-floating axle?

2—What type of stroke, the long-stroke motor or the square, most nearly resembles the action of the steam locomotive engine in pulling a grade? I notice on a gasoline motor that the motor is running at considerable speed though the car may be going slowly when pulling a grade in low gear, while in a locomotive both the speed of the exhaust and train is slower than that for a motor car.

3—Has it been proved that the long-stroke motor is more saving in fuel and more powerful than the old-style in two cars rated at the same horsepower? I have been told that a certain maker, who formerly made a model with an engine of 4-inch bore and 4¼-inch stroke had to change to the long stroke to keep the same horsepower in that model and enable it to pull hills. Why would this be necessary?—W. C. O'Neal.

1—A floating axle is a live drive-axle in which the driving element is entirely distinct from the load-supporting element; and in which the drive-axle carries none of the weight of the car. A floating axle may or may not have its tube extending through the wheel-hub. The bearings must be outside the axle housing, and are usually in line with the center of the wheel-hub. The Ford axle is semi-floating.

2—The long-stroke motor more nearly resembles the steam locomotive engine than does the short-stroke motor because of the greater pulling power of the long-stroke type at low crankshaft speeds. The reason for the use of the gearset with gasoline engines is that there is a certain speed at which they develop their full power and when they run at any speed below this the power decreases until at very low speeds, say 200 revolutions per minute, in the motor car engine, there is practically no power developed.

So to allow the engine to run fast enough to produce its full power it is allowed to run rapidly but turn the rear axle slowly by means of gears so that it produces a greater turning effort in the axle.

The reason the gasoline engine power depends on its speed is that each time a charge of gas is exploded a certain pressure is produced on the piston, which means a certain power exerted on the crankshaft and the only way to increase the power on the crankshaft is to increase the number of charges exploded in a given time, that is, increase the speed of the motor. When a heavy load comes on the motor, as climbing a hill, the motor slows down and consequently produces less power, making it slow down still more until it stops, unless the gears are shifted so that the motor can run faster. With the steam engine, however, the steam pressure is generated in a boiler. If the boiler is just big enough to supply steam enough at, say 100 pounds pressure for the engine at full speed, the minute the engine slows down under load the pressure in the boiler starts to increase because the steam is not being used up by the engine so fast and cannot get out any other way.

The increase of pressure on the steam engine piston makes up for its slower speed, and it exerts the same power as it did at higher speed. Thus a locomotive can pull a heavy train with the piston barely moving, because the pressure on the piston is enormous.

Another way of putting it is an direct analogy between the two types of power plants. The energy in the coal is made into power in the fire beneath the boiler and the energy is produced constantly. It is modified into flexible power in the engine cylinder. The gas engine produces its power in the engine cylinder, and at a constant speed. This power is modified into a more or less flexible power in the gearset. This is shown in Fig. 1. The principle that underlies this is that power consists of three factors, pressure, distance, and time, and is expressed in the term foot-pounds per minute. The proportions of these factors may be altered without changing the aggregate power, that is to lift a great weight a short distance in a given time, or a light weight a great distance in a given time. The steam engine accomplishes this automatically while the gearset must be operated manually.

3—The long-stroke motor is generally accredited with greater fuel economy than the short-stroke or square engine, all other things being equal, because of the greater expansion of the exploded charge, and because its greater flexibility permits running on high gear a greater portion of the time. It is admitted generally that the long-stroke motor is more flexible than the short-stroke type. In a 4 by 4½ motor, to lengthen the stroke without increasing the bore would actually increase the power, as it would increase the piston displacement, if nothing else. Of course

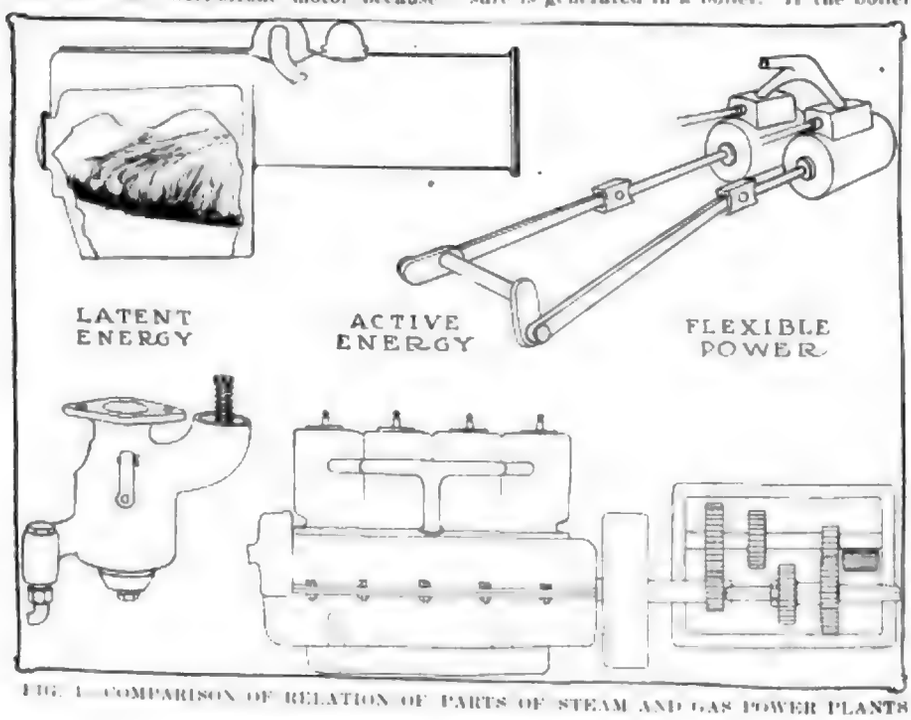


FIG. 1—COMPARISON OF RELATION OF PARTS OF STEAM AND GAS POWER PLANTS

EDITOR'S NOTE—In this department Motor Age answers free of charge questions regarding motor problems and invites the discussion of pertinent subjects. Correspondence is solicited from subscribers and others. All communications must be properly signed, and should the writer not wish his name to appear he may adopt a nom de plume.

Clearing House

Victim of Incompetent Repair Men Appeals for Aid—How to Restore Soft Tools—Price Difference Explained—Battery Wiring and Operation of Voltammeter

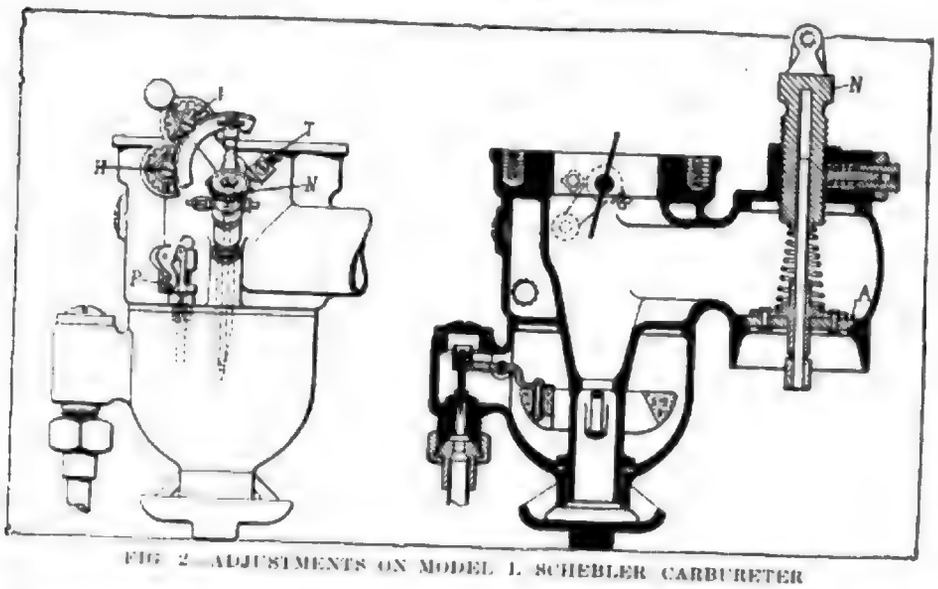


FIG. 2—ADJUSTMENTS ON MODEL L SCHEBLER CARBURETER

a motor of greater power can pull better. But even though the maker kept his displacement the same, as, for instance, with a bore and stroke of 3½ by 5⅞, a displacement of 226.1 cubic inches, as against 226.2 of the 4 by 4½-inch motor, he would probably have the same power, with a good engine design, but owing to the form of his engine, he would have greater pulling power at low speeds.

HARDENING SMALL TOOLS

Chicago—Editor Motor Age—Kindly explain the method of hardening tools. I have several which are too soft.—Reader.

The hardening of tools is a job that requires care and skill, but with a reasonable amount of care, skill is easily obtained if the workman thoroughly understands his work before he goes ahead. The first requisite is a clean fire, and a good draught. Green coal should never be used in hardening; charcoal is to be preferred. A good coke for this use, too, is easily prepared. This is made by banking the fire well with green coking coal, and poking holes in the bank to let the blast through. Turn the blast on full, and when all of the gas is out, the coke may be broken up and laid on the back of the fire ready for use in welding and hardening. The heat should be a bright cherry red, and should be uniform through the parts heated. When this heat is reached, the tool should be held for a few minutes directly over the fire, where it will not chill, until it stops sparking, when it should be quenched immediately.

For small tools raw linseed oil or water may be used. In dipping small tools, they should be immersed endwise, or perpendicularly, for if inserted into the cold fluid at an angle, one side will cool more than the other, and the tool will warp and sustain internal strains. Let the tool remain in the bath until quite cold.

It is usual to temper cold chisels, and other tools that are subjected to great vibration, after hardening, to make them less hard and more tough. This is done by heating them slowly to a medium cherry red, and quenching in cold water. It is the practice of many good smiths to dip small tools slowly, immersing for a few moments and then withdrawing to prevent the boiling of the water. A much better way in which to prevent the drawing of the temper too rapidly, is to heat the water lukewarm, to take the chill out of it. This will be found to make a better blend between the cutting edge and the shank of the tool. In all events, where the tool is only partially immersed, as is the case with chisels and bits, the tool must be kept in motion in the water to prevent uneven cooling and cracking.

EDITOR'S NOTE—To the readers of the Clearing House columns: Motor Age insists on having bona fide signatures to all communications published in this department, not necessarily for publication but as an evidence of good faith. Motor Age will not publish communications where this rule is not lived up to.

Carbureter Is Too Small

Buckeye Owner Finds That Efforts of Garage Men to Cure Motor Ills Fail

FREMONT, O.—Editor Motor Age—My Overland model 60 T has been causing me considerable trouble the past few months by a lack of power. Several Overland road mechanics, as well as all of the local repair men, seem to be able to afford me only temporary relief, and that by adjusting the model L Schebler carbureter. Until about a month ago this carbureter was 1¼ inches, when the local garage man could not get an adjustment on it, and so changed it to a 1-inch size of the same model. This gave fairly good results for about a week. Since then it has been necessary to change the adjustment on both air and gasoline nearly every day. The motor has excellent compression, and the Overland road mechanic who adjusted the carbureter last, said that the magneto was in perfect condition. This is the third Schebler L that has been on this car in 10,000 miles, and each has worked the same way for a while. Other Overlands in this city do not appear to lack power under the same conditions.—F. J. W.

Too small a carbureter probably accounts for your loss of power. You have to change your adjustment frequently because the carbureter is inadequate, and cannot supply enough mixture to allow your motor to generate its full power at all speeds. A carbureter properly adjusted should remain so for months.

The first thing to do is to test your inlet manifold for air leaks. This may be done by closing up all openings with paper and paraffin, and immersing it in water. Air bubbles will leak from any hole or porous place in the casting. If this member is found to be air tight, see that the gaskets between it and both the carbureter and the cylinder casting are in good condition. If not, put some in that are. Then test your compression personally, to assure yourself that the valves or piston rings do not leak.

The spark timing may be a contributary cause of your loss of power, as a late spark will not give full power. Test this by turning the motor over until the breaker breaks, at which time the piston of one of the cylinders should be dead on top dead center, as shown by the marks on the flywheel. If the magneto breaks before dead center, the timing is too early. This, however, is not likely to be the case with your car. If your timing is wrong, it is probably late, that is, the magneto will break after dead center. If this is found to be the case, the motor should be retimed by a reliable expert.

The engine being in normal condition in all of these particulars, replace your carbureter. Referring to Fig. 2, the first adjustment to be made is that of auxiliary air-valve A. Turn nut N down until this

no more since I made this change.

Louvers or slits in the side of the hood would have eliminated the heating, and are adopted by several sixes to let out the hot air, but it also lets out the sound that all makers are striving to subdue for their next series.

The writer is much interested in reading the different opinions appearing in Motor Age, and if this first try meets with your approval, will endeavor to do more from time to time.—F. T. Wheeler.

ELECTRICAL EXPLANATIONS

Louisville, Ky.—Editor Motor Age—Kindly explain and illustrate by diagrams the different wirings of a dry-cell battery, that is, series parallel and series multiple.

2—How do these various wiring systems affect both the voltage and amperage, and which is the best to use for new and weak cells?

3—Kindly explain and show by diagram how one indicator of a voltameter can register both volts and amperes.—Ernest Aeschliman.

1—These systems of wiring are shown in Fig. 3.

2—The best system of wiring to use on old and weak cells is series multiple. On new cells, simple series may be used, but just as good results and longer life are obtained by the use of the series multiple system. In general, parallel wiring gives only the voltage of one cell, while the series plan produces the sum of the potential of all cells.

3—This is shown in Fig. 4. V is the positive pole of the volt registering portion of the meter, A the positive pole of the ammeter portion, and N is the neutral or common ground pole. The voltmeter consists of a coil of fine wire about a moving solenoid core, which is attached to the needle, and fitted with a hair-spring resistance. The volt-meter circuit is shunted to step the current down, so that the reading may be taken on the full sweep of the hand for a relatively small number of volts. The winding of the voltmeter is of a great length, and by means of its high resistance allows but a small amount of current to flow through. Wound about this coil, and insulated from it is a coil of few turns of heavy wire, which allows the current to pass through with the minimum of resistance. These coils are therefore magnets, and draw the solenoid core inwards according to the strength of the current. It must be understood that both may register either volts or amperes, and that the only difference between the two instruments is that the relatively small amount of current flowing through the small-diameter, high resistance voltmeter winding measures but a small fraction of the total current, and therefore the drop in voltage is less, and the accuracy is greater. Other forms of these instruments use wound cores and disk, pivoted, or compass-beam armatures, to turn the needle. Calibrations are in red for volts and black for amperes.

Reasons for High Prices

Why Some Cars Cost More Than Others of Seemingly Similar Performance

INDIANAPOLIS, Ind.—Editor Motor Age—I have been asked time and again by prospective buyers what manufacturers put into their cars that should make them so high priced, that is, why one car should cost, say $2,500, more than another.

2—I would like to know what supplies to get to equip and start a good country garage; also what sizes of tires to carry, and wire for ignition and lighting purposes.—Reader.

1—The high-priced car design, while essentially little different from the cheaper car, calls for materials much more costly, machine work more accurate, workmanship more expensive, because done largely by hand, more elaborate equipment, and more expensive body work and upholstery. The cost of these features is high because the demand for cars of the highest grade is restricted, and hence the manufacturers of this class of machine are forced to manufacture in small quantities, which is much more expensive than in the enormous quantities in which small cars are turned out. The buyer of a high-priced car is harder and more expensive to sell and the competition among high-priced dealers is keener in individual sales. This adds enormously to the overhead or selling cost. Again, when a man has invested a small fortune in a car, he expects service, reasonable or unreasonable, fair or unfair, on the grounds that for the amount of money he is spending he is entitled to more car satisfaction. These service systems are very expensive. Advertising, too, is employed to a larger extent by the high-priced makers, in proportion to the number of cars sold.

The makers of cheaper cars, on the other hand, figure closely, they manufacture in enormous quantities, and design their cars to do the work with the minimum number of parts and machined surfaces. They are enabled to get their workmanship exact at little cost by means of special jigs, tools, templates, and automatic machinery, the cost of which is prohibitive to any but those whose output is great. The cars are built with less expensive equipment, and such as is supplied, is purchased in such large quantities that the price is small. The body work is much cheaper. The cars are sold in quantities, and the lowness of their prices automatically makes the market to some extent. Buyers seek the salesmen, instead of the salesmen seeking the buyers. These manufacturers indulge in no extravagant guarantees, and at the price they pay, owners do not expect a great amount of free service. They prefer to pay for it in repair cost, when it is needed, instead of including it in the purchase price. Advertising is not slighted; but the cost of this per car is small.

2—This can only be answered in a general way. In brief, gasoline, oil, repair sundries, a small line of accessories and supplies, and a stock of tools and standard motor-car hardware should be carried. Owners will expect to be able to purchase nearly everything for the car in a public garage, and will usually demand the advertised article. The most popular sizes of tires are 30 by 3½, 34 by 4, and 36 by 4, of which a full supply should be on hand, although a garage-keeper is frequently called on to supply other sizes. In a small garage, tires are likely to move slowly, and as they deteriorate with age, no bigger stock than can be kept moving should be carried. The usual plan with small garages is to watch the needs of the regular customers, and when their tires show signs of wearing out, order new ones of the required size. In some localities, the above sizes would not be called for, so that judgment must be used in the selection of a stock. Wire for ignition should be bought by the reel, and should include high-tension cable, copper primary wire, and twisted lighting wire. One reel of each is enough at a time. There will be no economy in buying a large stock. Local conditions are the best guide to stock selection.

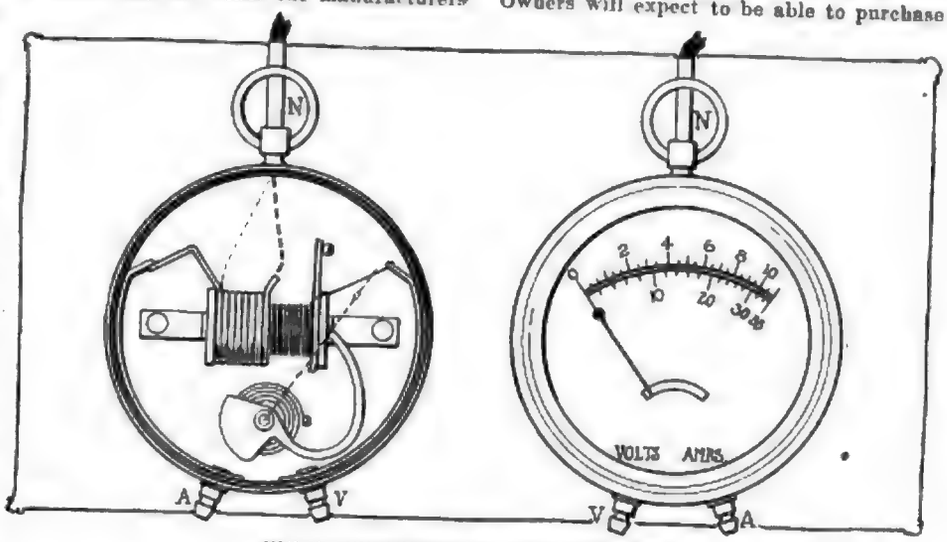
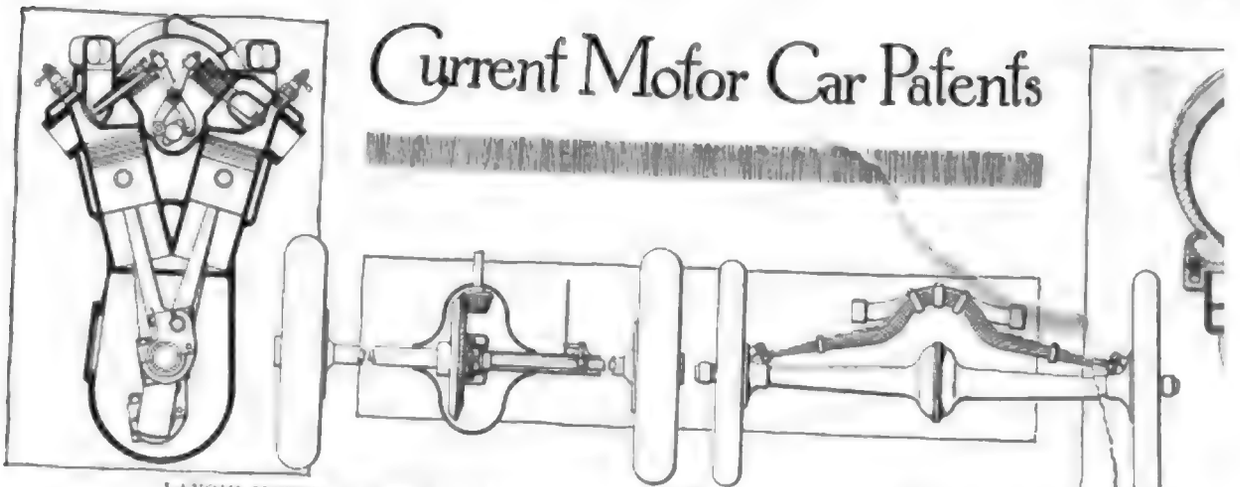


FIG. 4—FEATURES OF VOLT-AMMETER

Current Motor Car Patents

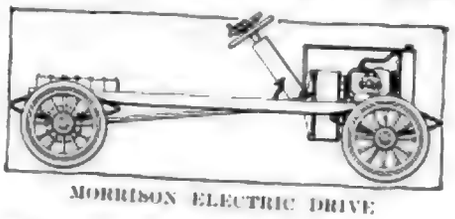


LAVOIE MOTOR, CRABBE DIFFERENTIAL LOCK, FORD SUSPENSION, AND BOOTH VALVE CONNECTIO

VALVE-IN-HEAD V-Type Motor—No. 1,044,198—To Alphonse Joseph Lavoie, Outremont, Quebec, Canada. Filed August 21, 1911, dated November 12, 1912. Of the four-cycle type, with valves of the poppet type, this motor is built with two cylinders set on an angle to each other, their heads diverging. Connecting rods from their pistons are pinned jointly to a bearing, in turn secured to the crankshaft. The valves are situated at an angle to the cylinders, their stems extending upwardly and inwardly, and operated by rockerarms from a camshaft carried above and between the cylinders. The spark plugs are carried in the extreme upper end of the valve chamber.

Dynamotor Electric Transmission—No. 1,044,409—To William Morrison, Chicago. Filed February 3, 1908, dated November 12, 1912. Operating on the principle of magnetic drag, the driving means to which this patent pertains consists of a dynamometer comprising a field and armature, one of which is connected to the crankshaft of a gas engine and the other to the propeller-shaft of a motor car, the object being to provide a flexible means of power transmission between the motor and the driving shaft which affords a range of speed differentiation, or gear reduction, to take the place of a clutch and gearset. The action of the device is to cause the driven shaft to be revolved by the driving shaft, in response to the magnetic attraction of the field for the armature, as caused by the magnetic flux across these two members induced by their relative rotation. The greater the speed of the driving member, with a given load on the driven member, the greater is the flux induced, and therefore the greater the magnetism, and consequent tendency of the parts to revolve at the same speed. An additional load on the driven member, however, increases the difference in speed between the two members, with the result of slowing down the driving means. This is prevented by a controller in the field circuit which, when moved in one direction, connects a greater number of cells in a storage battery in parallel with the field circuit, thereby increasing the field resistance and cutting down the magnetic drag, producing low reductions. When moved in the opposite direction the controller reverses this relation, so that the circuit is in series, from the battery to the motor, for the purposes of starting the engine, or with the engine running, of increasing the magnetic drag, producing higher gears. When the magnetic drag equals the driving load, the drive is direct, i. e., the armature and fields revolve at the same speed. The purpose of the battery is to start the motor and excite the dynamo.

Differential Lock—No. 1,043,805—To Elmer W. Crabbe, Bridgeport, Conn., assignor of one-half to Edward W. Harral, Bridgeport, Conn. Filed November 24, 1911, dated November 12, 1912. For the purpose of clutching the divided halves



MORRISON ELECTRIC DRIVE

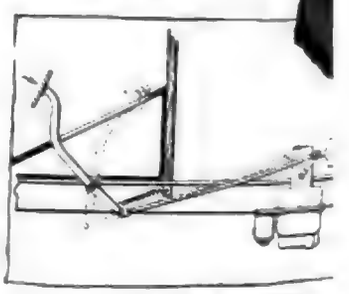
of a live rear axle together, so as to turn at the same speed, independent of the differential, this device comprises a telescopically sliding drive-axle on one-half of the axle, the end of which is fitted with the male member of a clutch adapted to be received by the female member, secured to the opposite stationary drive axle. This sliding axle is controlled by an angle lever, operated from the driver's place by a cable, rod or chain, so that in normal position a spring holds the clutch out of engagement, but when the control is actuated the axle is shifted so as to engage it.

Booth Demountable Rim Valve Connection—No. 1,044,435—To William N. Booth, Cleveland, O. June 2, 1911, dated November 12, 1912. Loosening the valve stem prior to the removal of the rim from the wheel has been found a troublesome feature in the use of demountable rims. The inventor of Booth demountables, therefore, has secured patents on a separable valve stem for use in this connection. It consists of the usual valve secured by a nut to the felloe of the wh inserted, need not be remov tube of the tire is a separa removing the tire automati from the felloe valve tube. the rim on the wheel, the automatically depressed, to tube to register with it springs back, securing the means of a flexible frictio

Ford Spring Suspension To Henry Ford, Detroit, application filed July 21, and this application filed O dated November 12, 1912. pension covered by this pa a pair of transverse half secured at their ends to sha ends of the axles, and fixed dles to arched cross-membe frame above the axles.

Pneumatic Engine Brake —To John D. Taylor, Edgew Filed April 25, 1910, dated 1912. To enable the engine an efficient air brake, this sists of an arrangement wh intake may be cut off and stituted therefor, and an a brought into play by the sh camshaft to cause the exha open at the end of each alter instead of at its beginning.

Throttle Control—No. 1, James J. Quigley, Mamaroneck October 9, 1911, dated Novem To render the action of a throttle control even and pos vention consists of a dash-p the throttle control.



QUIGLEY CONTROL

The Motor Car Repair Shop

Hints On Soldering

SOLDERING is a comparatively easy operation if a few of the small but important details of the art are known; but without this knowledge and the application of these details to the work, a successfully soldered joint is quite impossible. Cleanliness is one of these important details.

In soldering any two parts together, it is most essential that the contact surfaces of the parts be absolutely clean and bright. The hands and tools brought into

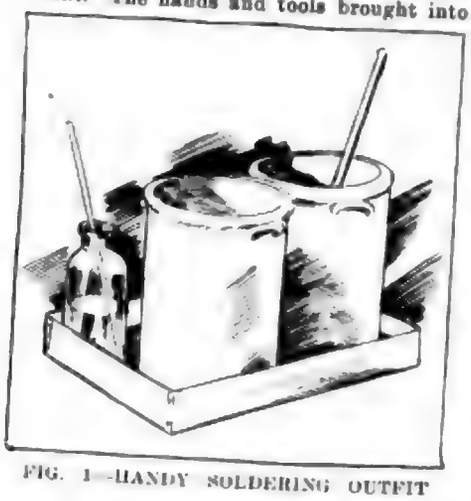


FIG. 1—HANDY SOLDERING OUTFIT

contact with the work must be free from oil or grease, and cleanliness must be rigidly maintained throughout the entire operation. A clean file, scraper, emery cloth or a little uncut acid is generally used in preparing the surfaces, after which they should be warmed, and swabbed with prepared acid; that is, muriatic acid which has been prepared by dissolving in it as much zinc as it has power to dissolve.

The Soldering Flux

The soldering fluid or flux generally used, may be prepared in the following manner: To ¼-pint of muriatic acid add scraps of zinc until the acid ceases to bubble and a small piece, or a few small pieces, of the metal remain. Let this stand for a day, then carefully pour off the clear liquid, or filter it through a piece of blotting paper rolled into a cone or funnel shape with the smaller end closed. Add to this a teaspoonful of sal-ammoniac, and when thoroughly dissolved the solution is ready for use.

The soldering iron, or copper bit, which is constructed of copper because of the qualities of that metal to absorb heat readily and as rapidly give it off again when brought into contact with other metals or substances, should be kept clean and well tinned to facilitate its use in distributing the solder as desired. If allowed to become overheated, crustations will form on the end of the copper bit, which will usually have to be removed with a file before the iron again can be used. A very good addition to a soldering outfit for cleaning irons is a piece of fluorite or fluor spar as it is generally called. This is an excellent flux and after an iron has been cleaned and heated and then rubbed on a piece of fluorite the tin or solder will spread readily thereon and adhere beautifully.

In many motor car repairshops, the acids, etc., used for soldering are kept in any old bottle and in any old place, the result is that they are hard to find when needed, and owing to the lack of a suitable arrangement for holding the receptacles they are often overturned and their contents spilled onto the bench or floor or even on the apron or running board of a car. The disadvantage of this is not only the loss of the acids, but disagreeable stains or damage where the acid was spilt as well. In Fig. 1 is shown the equipment used in a very large and systematic repairshop for holding the acid receptacles. The receptacles comprise two earthenware pots, such as are obtained from the grocer filled with jam or cheese, and one wide-necked bottle which originally contained pickles or preserves. These three receptacles rested in a shallow tray of sheet iron packed with sawdust or fine shavings. The sawdust serves not only to absorb the drippings of acid, but also forms such an excellent bed for the jars that they cannot be easily overturned; and in having them all on a tray in this manner, they are less liable to be scattered and hard to find when wanted in a hurry.

The broad-necked bottle in this equipment, contains pure acid for cleaning parts to be soldered; the first jar contains a dilute cut acid for cleaning the soldering irons; and the other jar holds the cut acid which is used as a flux and applied to the joint just before applying the solder. Wooden sticks are used for applying the acids. The operation of cleaning a soldering iron with acid, consists simply in dipping the hot iron into it for a second.

Making Glass Jars from Bottles

Where the necessary jars for acid receptacles cannot be conveniently obtained, excellent jars for this purpose may be made from old beer bottles and the like by cutting them in half a few inches below the neck as shown in Fig. 2.

The operation of cutting the bottle in half is as follows: Wrap a few strands of cord around the bottle and secure the ends by tucking them in—there should be a knot; then saturate the cord with gasoline or kerosene. Ignite this and let it burn as indicated in Fig. 2, until the flame is extinguished or nearly burnt out; then taking hold of the bottle at the bottom, invert it, and quickly dip it straight down into a pail of cold water. This will cause the bottle to crack or break evenly, and the sharp edges may be ground off with a fine emery stone or perhaps with a smooth file.

Oil Leaks Through Aluminum

Aluminum is a very porous metal, and owing to this feature of its structure, it is found that pipes and casings made from it are liable to show a disposition to leak which is apt to be quite aggravating to those not familiar with a suitable and effective remedy for such troubles. For instance, at a recent meeting of motor car sales agents there was a general complaint that one of the aluminum water connections of the motor on many cars

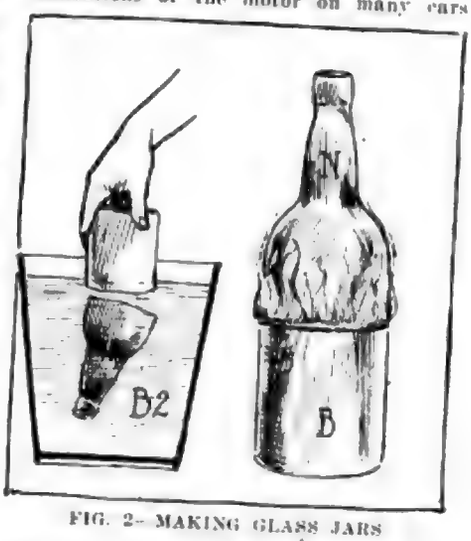


FIG. 2—MAKING GLASS JARS

showed a marked tendency to leak. One of the agents then announced he had found an excellent remedy for such trouble in coating the inside surface of such water connections with white lead.

Another firm once found that owing to the porous nature of its aluminum crankcases, considerable trouble was experienced with its motors because of failure of its vacuum oiling system to work properly. To eliminate this trouble, the company now shellacs the inside of its aluminum cases. Similar trouble has been experienced by one of the largest motor omnibus companies in the world, it having been found that there was a tendency on the part of the oil to seep through the pores of the aluminum crankcases, transmission cases, etc., and this concern now has all of its aluminum cases painted with white lead on the inside to remedy the trouble.

FIG. 2 CONGESTED CONDITIONS AT WABASH AND GRAND TRUNK FREIGHT DEPOTS

were right. If he did he would get but half a day's pay, for his team would have done its maximum daily mileage in that time. To work another 3 loads in the afternoon would require a fresh team. Hence it is to the driver's interest to hinder his horses so that they make but 15 miles in 10-hours their daily limit. Thus he gets a day's pay for what is really a half-day's work—and the union backs him in his inefficiency.

At the Santa Fe station in Chicago, there is a great appearance of business during certain periods of the day, especially around noon and from then to 3 o'clock. A census of the vehicles, however, in the yard and backed up at the platform would show that many of the teams were on the way to other points but had stopped here so that drivers could have a sleep. This yard is a regular stopping place for some drivers who take a nap there almost every day.

How Drivers Soldier

At other platforms wagons drive in for loads to the freight yards and deliberately choose a door at which two or three teams are already waiting. If the driver has delivered two loads in the morning he must take all the afternoon for the third and hence his choice. For from 1 to 3 hours he will loaf on the street or sleep on the wagon, even letting other wagons in ahead on occasions to prolong his wait.

Within an hour of noon if a load is on the way to the yards or a driver on the way back from the yards he will frequently stop at a saloon for an hour or so and let his load stand, blaming the delay, on his return to the freight station.

On Nov. 12 in front of a saloon near the Lake Shore freight yard no less than ten 2-horse trucks without drivers were counted idle at 1:40.

Often freight routes are blocked by drivers to cause further delays. On November 12 the street in front of the Lake Shore in and out freight platforms was completely blocked. On the one side were the projecting vehicles from the in platform, on the right those from the out platform and the space between was just wide enough for two teams to pass. The space between was a lane about 2 blocks long, cobble paved.

Every time a team came out from the in or out platforms or backed in to either all traffic in this central lane was held up. At about 10 a. m. on the day in question the vehicles jammed during one of these periods, the wagons coming in one end meeting others coming from the other direction.

At first the jam was not complete as shown in the first photograph but each driver began to edge forward for every inch he could make. At last the blockade was so thick that the writer had to follow the wall at the side, climbing over the tailboards of loading wagons at the side to get through and make a count. There were 155 wagons in the jam. At 11:30 a driver was met at the center of the space who had started in at the congested end at 10 o'clock. He had been toward the rear of the line at the first blockade but in some unaccountable way had wormed through half way, during the momentary spasmodic movements of traffic which took place from time to time. At last, at about 11:35 the jam resolved itself into two lines, by what appeared to be the mutual consent of the drivers, and traffic proceeded. As it was getting noon drivers were ready to break the jam.

Need of Regulation

This points also to the second reason in the list. The facilities for handling traffic just explained, are far from ideal, for teams backing into or coming out from the platforms on either side hinder central traffic. One officer in the central lane could have directed traffic and have prevented the extended blockade.

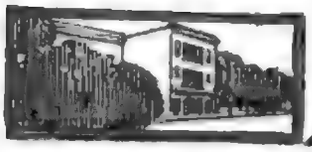
In this yard, the congestion was much greater at the north end. This had a direct bearing on the loading times of vehicles as shown in the table of actual times of loading and delay at three separate doors, the one at the south end 75, 68, 7 doors further north, and 58, ten doors beyond.

TIME REQUIRED FOR LOADING AND UNLOADING AND WAITS AT LAKE SHORE FREIGHT STATION

Size	Arr.	Start Unload	Wait Min.	All Off	Unload Time	Left	Total Time	Nature of Load
				DOOR 75.				
2 h	8:46	9:15	30	9:18	3	9:19	34	3 boxes
1 h	8:46	9:20	34	9:25	5	9:26	40	packages
1 h	8:50	9:28	38	9:31	3	9:32	42	6 paper rolls
2-h	9:20	9:34	4	9:46	10	9:47	27	Boxes
2 h	9:45	9:48	3	10:40	52	10:42	57	Full load
1-h	10:10	10:44	34	11:06	22	11:07	57	3-4-load
2 h	10:25	11:09	44	11:28	19	11:30	65	Lumber
2-h	10:40	11:32	Still unloading at Noon.					
						Average,	46	
				DOOR 68				
2-h	8:20	8:21	1	8:33	12	8:35	15	Bbls.
2-h	8:30	9:01	31	9:35	34	9:36	66	Rolls
2-h	8:45	9:37	52	9:53	16	9:55	70	Boxes
2-h	9:20	9:56	36	9:58	2	9:59	39	3 boxes
2-h	9:35	10:00	25	10:31	31	10:33	58	Full load
2-h	10:01	10:35	34	11:10	35	11:12	71	½ load off
2-h	10:15	11:14	59	11:56	42	11:58	103	Full load
						Average,	60	

Size	Arr.	Start Unload	Wait Min.	All Off	Unload Time	Left	Total Time	Nature of Load
1-h	10:30	Standing at Noon.						
2-h	10:34	Standing at Noon.						
				DOOR 58				
2-h	8:45	9:20	35	9:30	10	9:35	50	8 long boxes
2-h	9:00	9:40	40	10:00	20	10:01	61	Full load
2-h	9:28	10:03	35	10:35	32	10:36	68	Full load
2-h	10:20	10:30	17	11:50	73	11:51	91	Full load
						Average,	68	
1-h	10:36	Standing at Noon.						
2 h	10:48	Standing at Noon.						
						Total Average wait,	58 minutes	
				SPECIAL CASES				
2-h	8:50	9:45	50	10:20	35	11:10	2 hrs. 20 min. driver loafed after unloading	

Commonwealth Edison 1-ton electric arrives 11:05. Street blocked. Driver stops at end and carries box ½ block. Saves entering congested area. Entire street blocked for over 1 hour; 158 vehicles involved.



Among the Makers and Dealers

BIG Pittsburgh Fire—Fire in the garage of the Pioneer Motor Car Co., 5864 and 5866 Baum street, Pittsburgh, Pa., on the evening of November 15, caused a loss of about $30,000. A loss of $500 was suffered by the Iron City Tire and Repair Co., which occupies an adjoining building.

Gramm Finishes First Truck—The first truck completed by the Gramm-Bernstein Co., at Lima, O., was finished recently. It is of 3½ tons capacity, and the company will complete 250 of them by spring. The plant has been in operation for about 4 weeks and employs seventy-five men. The truck will bear the trade mark, "The World's Best."

Would Build for Farmers—G. W. Swartz, of Salome, Ariz., hopes to obtain local financial support in a factory he proposes to locate in Louisville, Ky. He contemplates the manufacture of a farm truck exclusively, which is designed to answer the various needs of the farmer. Mr. Swartz wants to capitalize the company at $1,000,000.

Van Auken Choose Pontiac—It is understood that the Van Auken electric commercial car will be manufactured in Pontiac, Mich., provided sufficient inducement is offered to warrant either the building or equipping of a plant there. The truck has a capacity of about 1 ton and is the design of C. M. Van Auken and G. S. Jacobs. It made its appearance about 6 months ago.

One Quits, Another Starts—Declaring that a year's trial has proved that the taxicab business in Wilmington, Del., is unprofitable, G. P. Postles announces that he has discontinued his service, which has been the only regular taxicab service in the city. A new one has just been inaugurated by the T. C. Bradford Co., which was started as soon as the Postles announcement was made.

Ottawa Show Plant—Next year's motor show in Ottawa, Ont., which will be held in Howick hall from February 11 to 15, promises to be the largest ever held in Canada. Practically all the space in the hall has been taken by local and other dealers. The show will be run under the auspices of the Ottawa Valley Motor Car Association and Ottawa motor car dealers. Louis Blumenstein will act as manager.

Keeps Plant Clean—Cleanliness is made an important factor in the Elyria, O., plant of the Garford Co., maker of Garford passenger and commercial motor vehicles. Every department of the big plant is kept as clean and free from litter as a big force of shop white wings constantly on duty during working hours can make it. Parts and materials are neatly piled, the passageways are never obstructed. In the automatic screw-machine room several men are kept busy all the time, carrying stock in and out and sprinkling sawdust on the floors to take up oil splashing from the machines.

Convicts Make a Car—Convicts at Sing Sing prison, N. Y., have just completed the construction of a motor car with the exception of the engine, which was purchased. Commissioner Edwards, of the street cleaning department of New York city will inspect the machine and if satisfactory it will be purchased and installed in the street cleaning department of the metropolis at a cost of $5,000.

Michelin Builds Another Addition—A large wing is being added to building 14 at the plant of the Michelin Tire Co., Milltown, N. J. This addition comprises 46,540 square feet of floor space. The new wing is one story high with a second story of 18,770 square feet over one section. This building is of reinforced concrete. The roof is of saw-tooth pattern, light and ventilation coming from above.

Changes in Engine Concern—Interests of President Warner and Secretary-treasurer Kaiser and others in the Milwaukee Motor Co., of Milwaukee, maker of engines, have been purchased by J. C. Coerper, August F. John, Harry G. John, Ernst Miller and James S. Church. Mr. Coerper has been elected president, A. F. John vice-president and general manager and Harry G. John secretary and treasurer.

Bosch Out of Shows—For the first time since 1909 the Bosch Magneto Co. will not exhibit its product at either the New York or Chicago shows. Cancellation was made of applications to the Motor and Accessory Manufacturers for space, because of the booths assigned being deemed too small for exhibition purposes. The Bosch company will keep open house at its New York and Chicago branches during the shows.

Toledo Plans a Show—The Toledo Auto Shows Co., of Toledo, O., has been incorporated by J. W. Banting, A. A. Atwood, H. W. Blevins, Guy R. Ford and others. The capital stock named was $10,000 and the company was incorporated for the purpose of putting on a Toledo show this winter in the Terminal building. While the date has not yet been definitely set, it probably will be early in February.

Richter Made Receiver—John J. Richter, of Laporte, Ind., has been appointed receiver of the Laporte Carriage Co., of Laporte, Ind., giving a bond of $10,000. The receiver was appointed in the federal court by Judge Albert B. Anderson, at Indianapolis. The receivership was created on the application of the Lackawanna Leather Co., of Chicago; the Hackettstown National Bank, of New Jersey, and M. M. Kates, of Chicago. In addition to the application for a receiver a petition was filed asking that the carriage company be declared a bankrupt. The company manufactures motor car bodies and buggies.

Lauth-Juergens Doing Well—The Lauth-Juergens Co., which removed to Fremont, O., from Chicago several years ago, under a bonus, is reported as getting along very well and now is employing 100 men, with an average payroll daily of $300. Most of the output is going to Boston and the east.

De Soto Incorporates—With an authorized capitalization of $20,000, the De Soto Motor Car Co. has been organized and incorporated at Auburn, Ind., to conduct a motor car manufacturing business. The directors and principal stockholders are L. M. Field, of Auburn; Hayes Fry and Glenn Fry, of Iowa City, Ia., and V. Van Sickle and H. J. Clark, of Des Moines, Ia.

Frontier Election—At the annual meeting of the stockholders of the Frontier Tire and Rubber Co., Buffalo, N. Y., officers were elected for the ensuing year, Orson E. Yeager being chosen president, while Frank V. E. Bardol and John W. Gibbs were chosen first and second vice-presidents respectively. George T. Roberts was elected treasurer, while M. F. Dirnberger, Jr., was elected secretary, with A. R. Robertson as assistant secretary and treasurer W. R. Price was selected as general manager for the coming year.

Oliver Reorganized—All the property of the defunct Oliver Motor Car Co., of Detroit, has been purchased from the receiver by a recently organized company known as the Oliver Motor Truck Co., which will be located at 460 Lawton avenue. G. A. Meyer is president of the new firm; F. J. Meyer is treasurer, and R. F. Beach will have charge of the sales. It is the intention of the new company to manufacture the Oliver 1,500-pound light delivery car and the 3,000-pound type, with a few changes made for the betterment of these machines.

To Make Tractors—The Wallis Tractor Co., capital $800,000, organized at Racine, Wis., by H. M. Wallis and other interests identified with the J. I. Case Plow Works, will engage at once in the production of tractors, tools, machinery and internal combustion engines. Temporary quarters have been arranged in the Case plow works, but a new plant will be erected as soon as possible. The principal stockholder is H. M. Wallis, who has been working on the development of tractors and new types of internal combustion motors for several years. Officers have not yet been elected by the corporation, nor have definite plans concerning the output been

made public. The J. I. Case Plow Works has no connection with the J. I. Case Threshing Machine Co., which produces Case motor cars.

Another Drawback Granted—The regulations issued by the treasury department at Washington on March 28, 1911, providing for the allowance of drawback on motor car top rubberized fabric, manufactured by the Archer Rubber Co., of Milford Mass., with the use of imported mohair cloth and cotton mohair cloth, have been extended to cover motor car covering cloth manufactured by the International Rubber Co., of New York.

Baker's October Business—The sales increase in the pleasure car department of the Baker company for October, 1912, shows a net gain over October, 1911, of 123 per cent. This is 36½ per cent higher than the total sales for April, 1911, which marked previously the greatest monthly volume of sales in the history of the Baker company.

Join M. and A. M.—The following have been elected to membership in the Motor and Accessory Manufacturers: John W. Blackledge Mfg. Co., manufacturer of auxiliary springs and shackles and accessories, Chicago; James L. Gibney Rubber Co., manufacturer of rubber tires, rubber goods and vulcanizers, Philadelphia, Pa.; Westinghouse Electric and Mfg. Co., manufacturer of electric vehicle motors, ignition and lighting outfits, East Pittsburgh, Pa.

New Orleans Show in February—With the last week in February selected for the 1913 show, New Orleans dealers have begun laying plans for the most pretentious event of this kind ever attempted in this city. At a meeting of the New Orleans Automobile Dealers' Association it was decided to place the management of the exhibition in the hands of T. C. Campbell, who was responsible for the success of the 1912 show.

Marion Agent Killed—Alfred L. Dinnin, who had the agency in Boston for the Marion car, was killed a few days ago when his car overturned as he was backing it on a narrow roadway where there was a steep bank on his left, the rear wheel leaving the road, causing an upset that pinned Dinnin under the machine, killing him instantly. His two companions escaped injury. He was formerly connected with the Connell & McCone Co., Boston agents for the Overland.

Election at Rochester—At the annual meeting and election of officers of the Rochester Automobile Dealers' Association, of Rochester, N. Y., Frank W. Peck was unanimously re-elected president, while C. E. Hartson was chosen again for vice-president. George J. Bauer was elected secretary. A. F. Crittenden, who has withdrawn from the motor car business, resigned from the treasurership and was succeeded by F. R. Luescher. The following were elected members of the board of directors: W. C. Barry, Jr., C. E. Hartson, A. M. Zimbrich, F. W. Peck, George J. Bauer, F. R. Luescher and Robert Thomson.

Thompson-Breese Plant Sold — The Thompson-Breese motor plow factory at Wapakoneta, O., which several weeks ago was thrown into the hands of a receiver, has been sold to John Breese, one of the former owners. Mr. Breese purchased the plant for $9,750. The plant will be enlarged and put into running condition at once.

New Goodyear Corporation—The Goodyear Tire and Rubber Co. of South America was incorporated at Augusta, Me., a few days ago with a capitalization of $3,000,000. The promoters named in the articles of incorporation are E. M. Leavitt, of Winthrop, Me.; Joseph Williamson, E. M. Hussey and M. D. Yeaton, of Augusta, and Pauline Lowell, of Hallowell.

Lamp Company Expanding—The John W. Brown Mfg. Co., located at Center avenue and West Broad street, Columbus, O., will award a contract for the erection of a large addition to its plant. The company is one of the largest manufacturers of motor car lamps in the country. The erection will be completed ready for occupancy by January.

Vehicle Club Election—The Electric Vehicle Club of Boston held its annual meeting recently, at which plans for reorganization were discussed. The organization committee was instructed to prepare a constitution and by-laws for presentation at the next meeting. The following officers were elected: Day Baker, president; E. S. Mansfield, vice-president; H. S. Thompson, secretary; J. S. Codman, treasurer; F. N. Phelps, Frank J. Stone and Morton J. Fitch, with the officers, executive committee.

Dividend Passed—The Federal Motor Truck Co. passed a stock dividend of $100,000 and declared a cash dividend of 10 per cent on November 14. This company was incorporated 3 years ago for $100,000 and has enjoyed a prosperous business since that time. Its output has increased from fifty trucks during the first year to 135 the second and 750 for 1912. For the coming season it is expected that about 1,500 will be sold. The officers of the company are T. E. Reeder, president; Edwin Denby, vice-president; Garvin Denby, treasurer, and M. L. Pulcher, general manager.

U. S. Tire Co.'s Sub-Branches—The United States Tire Co. has recently opened new sub-branches in Newark, N. J., Birmingham, Ala., Rochester, N. Y., Washington, D. C., and Milwaukee, Wis. In the near future sub-branches also will be opened in Providence, R. I., Worcester, Mass., Baltimore, Md., and Syracuse, N. Y., and in Columbus and Toledo, O. T. B. Goodloe, who has been in charge of the Richmond sub-branch, has been appointed manager of the Atlanta branch. Mr. Goodloe is succeeded in Richmond by J. G. Given. R. L. Ijams, who has been assistant to C. A. Gilbert, western district manager, has been transferred to the central district, under J. C. Weston, with headquarters in Chicago.

Moline Companies' Plans—Moline, Ill., manufacturers of cars—Moline, Velie and Midland—will be up and doing during the coming year. During the past season 3,182 cars have been built and marketed by the three factories. Plans for 1913 are for the building 5,900 cars, nearly twice the output of last year. During the coming year 3,500 Velie motor vehicles are to be put on the market, as against 2,200 for last season. But 200 Midland cars were made this year, but present plans call for the manufacture of 1,400 cars next year. The Moline Automobile Co. built 782 machines this year and will raise the mark to 1,000 during 1913.

New Plant in Syracuse—The large plant in North Geddes street formerly owned by the Syracuse Stove Co. has been sold to the Palmer-Moore Co., which will manufacture motor trucks. The concern has increased its capital stock from $100,000 to $200,000. T. G. Meachem is president, T. W. Meachem vice-president and Charles L. Palmer secretary and treasurer. For 3 years the company has been experimenting with a small plant on Talman street, turning out a two-cycle, slow-speed motor under patents granted to Edward Moore. A 1,500-pound delivery wagon will be manufactured. There will be soon 150 hands employed and 200 trucks will be put out the first 6 months of 1913.

Election at Albany—At the annual meeting of the Albany Automobile Dealers' Association, of Albany, N. Y., Chauncey D. Hakes was chosen president. Other officers elected were as follows: Vice-president, E. M. K. Hunt; secretary-treasurer, J. B. Wood; while these directors were chosen: Messrs. Hakes, Wood, Foskett, Hunt, Burlingame, Horace Rayno and A. M. Graham. Negotiations are pending for the show in the armory during the week of February 15-22. Unless satisfactory terms can be made the Albany dealers will arrange with the Troy, N. Y., dealers to have a joint exhibition in that city, as was done last year.

Bankruptcy Case in Washington—An involuntary petition in bankruptcy has been filed against the F. K. B. Co., motor car supplies, at 1110-1112 Fourteenth street N. W., Washington, D. C., by the Continental Rubber Co., R. E. Dietz Co. and the Commercial National Bank, of Washington, whose claims aggregate $12,000. The assets are said to be about $7,000. The bankruptcy court awarded adjudication, referred the case to a referee in bankruptcy and appointed Wilton J. Lambert and L. P. Loving receivers under a bond of $10,000. The company was formerly known as the Frank G. Fickling Co., and was reorganized last year when Fickling withdrew.

Development Briefs

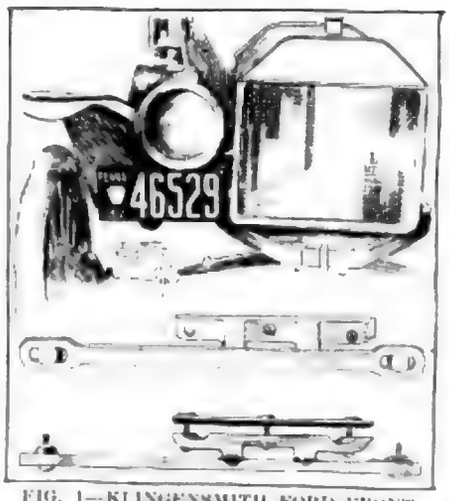


FIG. 1—KLINGENSMITH FORD FRONT LICENSE BRACKET

So-Sha-Belle Seating Arrangement

WHILE its name extols one of its virtues the So-Sha-Belle seating arrangement is an advantageous construction in many ways. This body construction, on which American and foreign patents have been secured, permits three passengers to occupy the front seats, without interference, and without substantially increasing the body width. This end is accomplished by setting the middle seat from 6 to 8 inches behind the front seat. This gives added seat width to the center seat, behind the other two. The driver occupies either one of the two side seats, where he is free from interference either from the hips or elbows of his seat-mates. While the body must be wider in front, it need not be as wide in the rear of a touring car as where three are seated abreast. The body length for seating six passengers is also greatly decreased, thus permitting the weight to be carried further forward, and the body to be built with less overhang at the rear.

Three general styles of bodies are used: Style A, in which the driver's seat is mounted on swivel levers, to be swung forward, under the wheel, permitting the other passengers to enter from the right side; Style B, in which the driver's seat is hinged to fold back against the back cushion, and in which the center seat is narrower than in the other two styles; and Style C, which has been adopted as the standard, in which the driver's seat slides back under the rear cushion, while the middle seat is extra wide. The side seats in this model, illustrated in Fig. 3, are provided with inside seat divisions, to provide the side passengers with more security. In the roadster models, an extra seat is fitted next the dash, which provides comfortable room for a fourth passenger. Touring car models have the same seating arrangement on the rear seat as on the rear. Two of these seating arrangements are shown in Fig. 6.

It is proposed by the So-Sha-Belle Seating Arrangement Co., of Los Angeles, Cal., holder of the Morgan patents covering this design, to grant license contracts to body builders and car manufacturers to use this design on a royalty basis.

Sager Bumpers

Leaders in the Sager line of bumpers for 1913 are the Sager Diamond bumper, which has been adopted by the Cadillac and Packard companies, and the Ford Special bumper. These two styles are two of forty, which constitute the Sager line, and are shown in Fig. 5. This line embraces tubular, channel, and reinforced channel types, and the statement of the Sager people that the diamond type is superior, is therefore to be taken as unprejudiced. This type of tubing consists of a heavy hardened brass tube, diamond shaped, reinforced throughout its length with a thick open-hearth steel rib. It is mounted on a special mounting in which all fastenings are concealed. The bracket is solid brass, inclosing a concealed spring, and plunger. It is secured to the frame by means of a set-screw and jam-nut inside the frame. The Ford Special uses a plain round bar, and a pressed steel bracket, which clamps inside the front channel section of the frame, by means of a U-shaped stirrup, while the shock-absorbing springs are concealed within the steel bracket. They are produced by the J. H. Sager Co., Rochester, N. Y.

One-Piece Formed Clutch Facings

Formed on a developed plane projection, accurately to fit the face of a cone clutch, a one-piece clutch-facing is offered by the Detroit Clutch Cover Co., Detroit, Mich., that possesses several points of interest. After investigating chrome or mineral tanned leathers, sole leathers, and various combination tans, the selection of a suitable tan, the most important point in the making of a clutch facing was decided in favor of solid oak tan, of which all of their facings are made. This leather is especially treated to resist heat and friction. The facings are made in the form of a true cone to fit exactly and individually the clutch for which they are made, and it is claimed, may be applied with the fewest number of rivets. The bearing is even about the entire surface of the clutch, which has a tendency to prevent grabbing and slippage under load. When manufactured in quantities for manufacturers, they are formed on special machines so that they are interchangeable and always of even thickness, permitting application by the most inexperienced. All that is required in application is to force the leather cone over the steel one, with the rivet-holes in line, and insert the rivets. The joint is

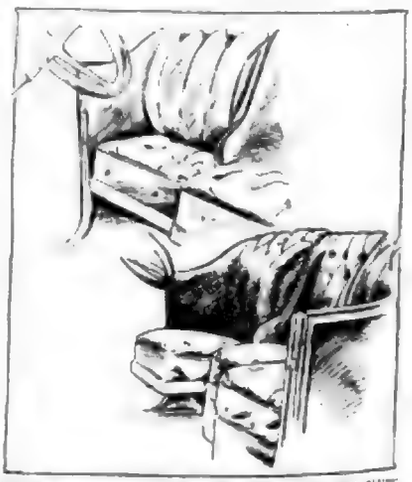


FIG. 3—SLIDING DRIVER'S SEAT OF NEW BODY

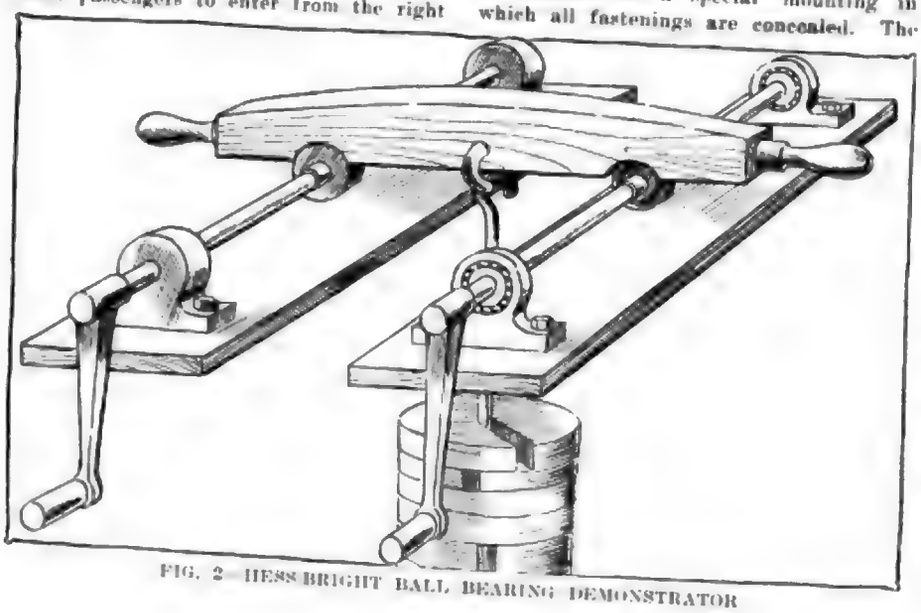


FIG. 2—HESS-BRIGHT BALL BEARING DEMONSTRATOR

Brief Business Announcements

Agencies Appointed by Motor Car and Truck Manufacturers

PLEASURE CARS

Town—	Agent	Car
Allentown, Pa.	Luchenbach Brothers	Franklin
Akron, Colo.	George MacDonald	R. C. H.
Amarillo, Tex.	Lon Sellars	R. C. H.
Baltimore, Md.	Detroiter-Baltimore Co.	Abbott-Detroit
Baltimore, Md.	Henderson Motor Sales Co.	Henderson
Bartlesville, Okla.	Cherokee Motor Car Co.	Moon
Beloit, Wis.	L. Allen Co.	Abbott-Detroit
Berlin, N. H.	W. G. Dupont	R. C. H.
Bluefield, W. Va.	Appalachian Auto Co.	Apperson
Bluefield, W. Va.	Appalachian Auto Co.	Buick
Boston, Mass.	Hoyt Carburetor & Auto Co.	Havers
Buffalo, N. Y.	Automobile Sales Co.	Pullman
Columbus, O.	S. W. Schott & Co.	Empire
Columbus, O.	S. W. Schott & Co.	Brush
Columbus, O.	D. W. Short	Metz
Cincinnati, O.	Peters & Keating	Alco
Cleveland, O.	Maurice Rohrheimer	Alco
Craig, Ia.	Craig Auto Co.	Moon
Canton, O.	A. H. Wilson Motor Car Co.	R. C. H.
Cambridge, O.	J. B. Siegfried	R. C. H.
Davenport, Ia.	Richard Altendorf	Michigan
Darlington, Wis.	A. C. Poole	Abbott-Detroit
Dallas, Tex.	Davis & Turney Auto Co.	R. C. H.
Delhi, Minn.	Kunde A. Knudson	R. C. H.
Danube, Minn.	W. F. Schroeder	R. C. H.
Evanston, Ill.	Fancher Brothers	R. C. H.
Edgeley, N. D.	A. M. Hodge	R. C. H.
Gaylord, Minn.	N. C. Doering	R. C. H.
Garske, N. D.	R. J. Orchard	R. C. H.
Grand Rapids, Wis.	Jenkins Brothers Co.	Oakland
Govans, Md.	Otis E. Williamson	Norwalk
Grand Rapids, Mich.	Modern Garage	Alco
Grand Rapids, Mich.	Modern Garage	Marion
Greenville, O.	Swope Music & Auto Co.	Overland
Hammond, N. Y.	D. E. Coats	Franklin
Hudson, Wis.	Hudson Garage Co.	Overland
Hudson, Wis.	Hudson Garage Co.	Ford
Hackensack, N. J.	Beyer & Feakes	R. C. H.
Hicksville, N. Y.	Karlson's Garage	R. C. H.
Harrisburg, Ill.	Charles V. Parker	Moon
Hillsboro, Tex.	Walter-Hafner Jewelry Co.	R. C. H.
Ipava, Ill.	E. J. Weese	R. C. H.
Ipswich, Mass.	Ernest C. Currier	R. C. H.
Janesville, Wis.	Janesville Auto Co.	Herreshoff
Janesville, Wis.	Janesville Auto Co.	Chevrolet
Jacksonville, Fla.	Wiesenfeld Warehouse Co.	Alco
Jacksonville, Ill.	Modern Garage	Hupp-Yeats
Joplin, Mo.	Joplin Supply Co.	Moon
La Crosse, Wis.	Elsen & Phillips	Cole
Louisville, Ky.	Southern Motors Co.	Packard
Louisville, Ky.	Southern Motors Co.	Detroit
Little Rock, Ark.	C. L. Hoffman	Oakland
Leesville, S. C.	Model Garage	Oakland
Los Angeles, Cal.	L. C. Buxton	Moon
Long Meadow, Mass.	C. W. North	Havers
Loveland, Colo.	Ray Danner	R. C. H.
Little Rock, Ark.	Westcott Motor Car Co.	Hupp-Yeats
Little Falls, N. Y.	Frank F. Stacey	Franklin
Malden, Wash.	George E. Lattin	Abbott-Detroit
Mauston, Wis.	C. L. Sharp	Oakland
Miami, Fla.	Charles Jones	Alco
Madison, Wis.	Albrecht Motor Sales Co.	Cutting
Madison, Wis.	Albrecht Motor Sales Co.	Little
Madison, Wis.	Albrecht Motor Sales Co.	Herreshoff
Macon, Mo.	Macon Garage Co.	Moon
Mediapolis, Ia.	Fleenor's Garage	Moon
Montclair, N. J.	Montclair Garage & Machine Co.	Moon
Mancos, Colo.	George D. Woods	R. C. H.
Montreal, Que.	Royal Automobile Co.	Cole
Moira, N. Y.	W. S. Lawrence	R. C. H.
New Haven, Conn.	J. J. Lavercy	Moon
New Haven, Conn.	John J. Laverty	Moon
New Orleans, La.	Demack Motor Car Co.	Haynes
New York, N. Y.	Julius Lichtenstein	R. C. H.
Olean, N. Y.	G. R. Daniels	R. C. H.
Olsen, N. D.	Martin Rimestad	R. C. H.
Odell, Tex.	B. D. Smith	R. C. H.
Portage, Wis.	A. R. Slinger	Cole
Providence, R. I.	J. B. Higginson	Henderson
Portsmouth, O.	R. S. Pritchard	Mitchell
Portsmouth, O.	Portsmouth Automobile & Machine Co.	Paige-Detroit
Portsmouth, O.	W. J. Friel	Ford
Philadelphia, Pa.	V. P. Padula	Havers
Racine, Wis.	Gunther & Laux	Ford
Rochester, N. H.	W. H. Carll & Sons	R. C. H.
Rosenberg, Tex.	Rosenberg Motor Car Co.	Moon
Regina, Sask., Can	Regent Motors, Ltd.	Franklin
San Francisco, Cal.	L. S. Johnson	Arbenz
Syracuse, N. Y.	J. M. Watkins	Metz
St. Louis, Mo.	Wiemeyer Motor Car Co.	Ames
Syracuse, N. Y.	Jefferson Garage Co.	Alco
Sharon, Wis.	Anderson Auto Co.	Little
Savannah, Ga.	J. J. McDonough, Jr.	Oakland
St. Matthews, S. C.	Banks Auto Co.	Oakland
Schaller, Ia.	E. F. F. Hasseler	Moon
Seattle, Wash.	R. H. & H. C. Gray	Havers
Syracuse, N. Y.	James Auto Co.	Havers
Springfield, Mass.	Shean Auto Station	R. C. H.
Schenectady, N. Y.	W. D. Havens	R. C. H.
Sidney, Neb.	McIntosh & Brewer	Franklin
Tampa, Fla.	Charles H. Moorhouse	Alco
Taylor, Tex.	Prewitt Auto Co.	Moon
Terre Haute, Ind.	Terre Haute Machine Works	R. C. H.
Toledo, O.	Herman F. Hohly	Imperial
Wilmington, N. C.	H. L. Fennell	Oakland
Winfield, Ia.	Nesbitt Auto & Supply Co.	Moon
Wooster, O.	J. N. Ginter	R. C. H.
Waterville, Me.	Elm City Publishing Co.	R. C. H.
Wichita, Kans.	Kansas Motor Car Co.	Hupp-Yeats
Washington, D. C.	Dupont Motor Co.	Hupp-Yeats

TRUCKS

Town—	Agent	Car
Allentown, Pa.	Allen Motor Co.	Lippard-Stewart
Baltimore, Md.	R. Stuart Beaver	Lippard-Stewart
Buffalo, N. Y.	Reinold Brothers	Lippard-Stewart
Cincinnati, O.	Peters & Keating	Alco
Cleveland, O.	Maurice Rohrheimer	Alco
Cleveland, O.	Henry E. Ricker & Co.	Lippard-Stewart
Edmonton, Alb., Can.	Northrup Motor Service Co.	Lippard-Stewart
Grand Rapids, Mich.	Modern Garage	Alco
Houston, Tex.	Young & Dwire	Alco
Jacksonville, Fla.	Wiesenfeld Warehouse Co.	Alco
Los Angeles, Cal.	Albert Biner	Lippard-Stewart
Miami, Fla.	Charles Jones	Alco
Nashville, Tenn.	Martin & Crocker	Lippard-Stewart
New York	Strong & Trowbridge	Sanford
Portland, Ore.	Coast Commercial Car Co.	Lippard-Stewart
Philadelphia, Pa.	Gomery-Schwartz Motor Car Co.	Lippard-Stewart
Rochester, N. Y.	Mandery Motor Car Co.	Sanford
Rochester, N. Y.	Mandery Motor Car Co.	Lippard-Stewart
Savannah, Ga.	Savannah Motor Car Co.	Lippard-Stewart
Salem, Mass.	North Shore Motors & Service Co.	Lippard-Stewart
Syracuse, N. Y.	Jefferson Garage Co.	Alco
St. Louis, Mo.	Federal Truck Co. of St. Louis	Lippard-Stewart
St. Paul, Minn.	Borg & Wharry Motor Co.	Lippard-Stewart
Tampa, Fla.	Charles H. Moorhouse	Alco
Utica, N. Y.	Crim-Bronner Auto Co.	Lippard-Stewart
Wilkes Barre, Pa.	Koons & Hallier	Lippard-Stewart

DETROIT, Mich.—J. C. Ayers has taken the managership of the General Motors Truck Co.'s Detroit branch.

Minneapolis, Minn.—The Minnesota Cartercar Co., 1021 Hennepin avenue, has leased part of the quarters of the Mercer Motor Sales Co., 729 Hennepin avenue.

Boston, Mass.—Manager H. D. Pruden, of the Boston branch of the Kisselkar, has moved from the Motor Mart into the new building just completed for the branch on Commonwealth avenue. It is a two-story building of reinforced concrete 74 feet wide and 200 feet deep. The salesroom is 74 by 70 feet on the first floor front.

Baltimore, Md.—The Baltimore branch of the Franklin Automobile Co. has moved into new quarters at 1919 North Charles street.

Minneapolis, Minn.—After considerable delay because of complications in the city council, the Ford Motor Co. has been able to let the contract for the excavation for its northwestern assembly plant and distributing warehouse at Fifth street and Fifth avenue N., covering a quarter city block. Work has begun.

Uniontown, Pa.—The Standard Garage Co. is building a $50,000 garage. The building will be two stories high on a lot 52 by 97 feet.

Springfield, Mass.—W. L. Bunker, secretary-treasurer of the Springfield Automobile Club, and A. V. Reopwell, formerly a member of the Woodward-Reopwell Motor Co. in that city, have formed a new

company to handle the Rambler, Chevrolet and Little cars in their territory with headquarters at 18-20 Fort street.

Bowmanville, Ont.—The Goodyear Tire and Rubber Co. of Canada has secured permission to increase its capital from $500,000 to $3,000,000.

St. Paul, Minn.—The Nolan Brothers Motor Truck Co., St. Paul agent for the Wilcox truck, is to open a garage January 1. The firm is looking for a location.

New Orleans, La.—Pending the complete overhauling of its salesroom and garage at Julia and St. Charles streets, the R. C. H. Sales Co. has occupied rooms at 811 St. Charles street.

Pittsburgh, Pa.—The foundations have been completed by Hennewitz Brothers, of Van Wert, O., for a two-story brick and concrete garage and machine shop, which will measure 60 by 132 feet.

Philadelphia, Pa.—C. H. Walz, until recently manager of the Auto Equipment Co., has been appointed general manager of J. H. McCullough & Son, dealers in supplies and accessories, 219-221 North Broad street.

Glens Falls, N. Y.—The Empire Automobile Co. has secured a 10-year lease of the entire Joubert & White building at 45-47 Warren street, and it will combine its garage business with the manufacture of motor trucks.

San Francisco, Cal.—Frederick J. Linz and L. W. Sanborn have purchased the entire assets and capital stock of the United Motor San Francisco Co. Both Linz and Sanborn have been identified with the Maxwell since 1905.

Boston, Mass.—The Motz Tire and Rubber Co. has changed its line in Boston, formerly handled by the Standard Tire and Rubber Co., as an agency proposition to a factory branch, with M. A. Frank as manager and headquarters at 4 Dundee street.

Webster, S. D.—A. W. Tyner has severed his connection other than a director of the Tyner Garage Co. and is succeeded by Katherine McGraun. A. W. Tyner, W. B. Bauer and Frank Forbes, of Aberdeen, have incorporated the South Dakota Motor Car Co., of Webster, with branches at Aberdeen, Huron and Deadwood. The officers are A. W. Tyner, president; Frank Forbes, vice-president, and W. B. Bauer, secretary-treasurer. The new company will handle the Detroiter for South Dakota.

Atlanta, Ga.—Undoubtedly one of the most elaborate garages ever run in connection with a hotel in the south is that just opened in Atlanta. It is called the Georgian Terrace garage and it adjoins the new resort and family hotel in Atlanta. The affair is really two separate buildings. The first is three stories in height and contains salesrooms, offices, an elaborately fitted chauffeurs' club room, shower baths and rooms for hotel employes. The garage proper is 125 by 150 feet and contains a machine shop as well as ample storage space. The new garage is run by A. L. Belleisle.

New York—E. V. Stratton has secured the services of Harry R. Fletcher. Mr. Fletcher will have charge of the sale of Flanders trucks.

New York—The A. Hazen Green Co., 1686 Broadway, New York, has been appointed New York distributor for the Zero 40, a non-freezing fluid for use in radiators.

Minneapolis, Minn.—The Northwestern Shawmut Tire Co. has moved to 1210 Hennepin avenue. The company has taken the agency also for Warner instruments. A. J. Hunziker is manager.

Detroit, Mich.—C. M. Clement has become production manager of the Metal Products Co. His former connection was with the Weston-Mott Co., Flint, Mich., of which he was factory manager.

Minneapolis, Minn.—The Robinson-Loomis Motor Truck Co. has changed its name to Robinson Motor Truck Co., due to retirement of Mr. Loomis. The company will continue to make Gopher and Minneapolis trucks.

Owego, N. Y.—Theodore D. Gere and Frank B. Tracy have formed a partnership to manufacture a commercial motor truck. Negotiations are in progress for leasing the Robert Nichols building in Owego for the manufacturing plant.

Minneapolis, Minn.—J. V. Campbell, formerly in charge of the Colby branch in Minneapolis, has gone to Chicago to take charge of the Colby branch there. A. Walch will open the new Minneapolis branch building about December 1.

Boston, Mass.—J. W. Hamilton, manager of the Roberts & Sherburne Co. in Boston, agent for the American line, resigned last week to go back to the banking business. J. C. Mullin, who has charge of the salesforce, is acting manager temporarily.

Chicago—The Electric Generator and Accumulator Co. has moved its local quarters from 2437 Michigan avenue to 1349 Marquette building. Its factory is at Argo and the concern makes electric lighting and starting equipment.

Minneapolis, Minn.—The Andersch Brothers Motor Car Co. has begun erection of the $50,000 building at Harmon and Spruce places, from which it will distribute Abbott-Detroit cars in the northwest. J. W. Murphy, Fargo, N. D., has been made district sales manager.

Detroit, Mich.—The Cleveland factory branch of the Lozier Motor Co. has been discontinued, a selling organization, to be known as the Lozier Sales Co., of Cleveland, having been formed for the purpose of selling Lozier cars in Cleveland and northern Ohio. It is understood that the new company has been organized with a capital of $50,000, subscribed by prominent business men of Akron, Ohio. A. W. Woodruff has been appointed manager of the new company. The salesroom will be located at 2336 Euclid avenue.

Minneapolis, Minn.—The H. J. Miel Auto Co., Franklin dealer, has moved into a new salesroom and service station at 1400 Hennepin avenue.

New York—The Gildel Auto Co. has been formed here to handle the Kline exclusively by Messrs. Gilman and Videl. Salesrooms have been opened at 1930 Broadway.

Philadelphia, Pa.—John Wilson Drown, formerly advertising manager of the Standard Roller Bearing Co., has been appointed sales manager of the Pressed Steel Mfg. Co., of this city.

Philadelphia, Pa.—Russell T. Kingsford has resigned his connection with the Peerless Motor Car Co. to accept the position of chief engineer with the Rushmore Dynamo Works, Plainfield, N. J.

Washington, D. C.—James J. Flynn has resigned as manager of the Washington branch of the Locomobile Co. of America. His successor has not yet been appointed. Mr. Flynn has several offers under consideration.

Richmond, Va.—W. D. Sapp has formed a company to handle the Overland and Gramm truck, with quarters at 303 Carey street. The company has not been named and will not begin operations until the latter part of November.

Chatham, N. Y.—Work will be started soon on the transformation of the Nellis building, Main street, Chatham, from a garage into a factory for the manufacture of motor car parts. Ralph Frear, who now runs the garage, will be retained as manager of the entire structure.

Denver, Colo.—The Michigan Motor Car Co., of Kalamazoo, Mich., has established in Denver a distributing branch for Colorado and Wyoming. The agency is in charge of F. P. Sevier, representing F. C. Cullen, of Chicago, the company's western agent. The same agency has also completed arrangements to represent in this territory the Waverley electric.

Milwaukee, Wis.—H. W. Bonnell has been appointed manager of the Milwaukee branch of the Mitchell Automobile Co., distributor for the Mitchell-Lewis Motor Co., of Racine, Wis., in Chicago, Milwaukee and other cities. Norman R. New continues as sales manager. L. A. Peil, president of the company, has disposed of his interest upon taking the position of sales manager of the Mitchell-Lewis Co.

Milwaukee, Wis.—One of the largest and most perfectly appointed public garages in the middle west is now being erected for Julius Strauss at Hackett and Downer avenues, Milwaukee. The building will have ground dimensions of 213 feet on Downer avenue and 65 feet on Hackett avenue, and will be two stories high. The first floor will accommodate seventy-five gasoline cars and the second will be ar-

ranged to care for 110 electric cars, with smoking room, shower baths, library and rest room for chauffeurs.

Detroit, Mich.—W. M. Jenkins, former sales manager of the Simplex Motor Car Co., has become Pacific coast representative of the Abbott Motor Co.

Rochester, N. Y.—The F. R. Luescher Co. has taken possession of the new building at 191 East avenue. The company handles the Rambler, Oldsmobile, Reo and Detroiter.

Detroit, Mich.—The Oakland Motor Car Co. has opened a new branch at Houston, Tex., with A. J. Challinoir in charge. Mr. Challinoir was formerly connected with the factory at Pontiac, Mich.

Tacoma, Wash.—J. B. Baldy, of Tacoma, will hereafter manage the Northwestern Equipment Co., at 505 South Ninth street, and will also act as Tacoma agent for Ajax tires. F. F. Athow is associated with the new firm.

Philadelphia, Pa.—The Perfection Tire Co., Inc., has leased the store and basement of the property at the southwest corner of Sixteenth and Sansom streets for a period of 5 years. The company will handle tires and accessories.

Akron, O.—The Firestone Tire and Rubber Co., of Akron, O., has closed a lease for the entire first floor of a new building at 197-199 East Gay street, Columbus, O., in which will soon be opened a large branch agency for that line of tires.

New Orleans, La.—A charter has been filed by the J. A. Landry Motor Car Co. asking the formal legal permission to do a general motor car business in this city. The company is capitalized at $25,000. It will deal in sundries and supplies.

San Francisco, Cal.—H. G. Salisbury, recently appointed general manager of the Pathfinder Motor Car Co. of California, has appointed Barry Cool manager of the San Francisco branch. Cool has been sales manager of the Hudson agency of Los Angeles.

Washington, D. C.—The Michigan Motor Co. has been incorporated under District of Columbia laws with the following officers: T. Oliver Probey, president; J. H. Stuart, vice-president; George R. Stuart, secretary-treasurer; F. C. Sibbald, sales manager; E. G. Powell, head of service department. The company has opened a salesroom and service department at 1230 Wisconsin avenue, and will handle the Michigan in this city and surrounding territory.

Beaver Dam, Wis.—Stoddart Brothers, liverymen at Beaver Dam for more than 30 years, on November 15 retired to engage in the motor car and garage business. The stables, considered the largest in the central part of Wisconsin, are being entirely remodeled, made fireproof and arranged for garage purposes. Stoddart Brothers intend to carry on only an agency business in connection with real estate and insurance, and the garage and repair shop will be conducted by the Beaver Garage Co., now situated on East Third street.

Louisville, Ky.—Extensive building extensions are under way in the electric vehicle department of the Kentucky Wagon Mfg. Co., maker of the Urban electric. After the alterations are made this department will have three times its present capacity.

Columbus, O.—The Seventeenth Street garage is the name of a garage and repair shop opened recently by R. V. Jones and David Tope at 95 North Seventeenth street.

Oconto Falls, Wis.—The Oconto Falls Motor Car Co., distributor of Overland and Ford cars, is building a $10,000 garage, to be fully equipped with machinery driven by electric power.

Portland, Ore.—W. S. Dulmage has purchased the interest of D. M. Smith, who has been associated with him in the firm of Dulmage & Smith. Mr. Dulmage has the agency for the Hupmobile.

Marshalltown, Ia.—The Marshalltown Motor Material Mfg. Co., Inc., or as known in the abstract as the M. M. M. M. Co. Inc., will henceforth abandon the names in question. It will be the V-Ray Co., Inc.

Melrose, Mass.—The new garage for the Smith Brothers Co., recently completed at Melrose, will take care of sixty-five cars, and the company has just taken the agency for the Overland cars and the Ajax tires.

San Francisco, Cal.—The Fiat agency in northern California, long controlled by the Pacific Coast Motor Car Co., has been taken over by Dwight Whiting, of Los Angeles. John Davis, from the Fiat factory, will be local sales manager.

Philadelphia, Pa.—J. V. Harrigan, lately assistant manager of the Firestone Tire and Rubber Co., has formed the M. S. H. Sales and Rubber Co., with headquarters at 660 North Broad street. Mr. Harrigan will act as vice-president of the new concern.

Baltimore, Md.—The Oakland Motor Co., representative of the Oakland car and Federal truck, has leased the large warehouse at Biddle, Howard and Park avenues. The company will continue to occupy the salesrooms at 6 and 8 East Chase street.

Philadelphia, Pa.—The Ford Motor Co. has removed from 250 North Broad street to 257-259 North Broad street. The past week also witnessed the opening of the company's new service and assembly building at Sixteenth street and Washington avenue.

Boston, Mass.—The Frank Rilion Co., well known in the electrical field in New England, with headquarters in Boston, has decided to build motor trucks of from 1 to 6 tons capacity, designed by Victor J. Houdon. The vehicles will be built in the present workshops in South Boston.

Boston, Mass.—The John S. Harrington Co., which began business first in Worcester, then branched out to Providence and later entered Boston, and handles the Flanders line, has decided to make the Boston office its main distributing headquarters hereafter instead of its salesrooms at 730 Main street, Worcester.

Recent Incorporations

Auburn, Ind. DeSoto Motor Car Co.; capital stock, $20,000; directors, L. M. Field, H. Fry, G. Fry, V. Van Sickle, H. J. Clark.

Buffalo, N. Y. American Kushion Kore Tire Co., capital stock, $10,000; incorporators, Charles H. Taylor, C. M. Baldy, K. E. Wilhelm.

Chicago Grove Auto Truck Garage Co.; capital stock, $50,000; general motor car and garage business; incorporators, T. E. McBell, H. McCurdy, W. H. Neterer.

Chicago Keeton Motor Co., capital stock $60,000 to manufacture motor cars and accessories; incorporators, K. R. Roberts, W. C. Spenny.

Cleveland, O. Hall Miller Auto Co.; capital stock, $5,000; to deal in motor cars; incorporators, J. A. Freund, Jr., L. D. Greenfield, J. A. Freund and others.

Cleveland, O.—Northern Ohio Motor Co.; capital stock, $25,000; to deal in motor cars; incorporators, H. W. Bell, E. L. Bennings and others.

Cleveland, O.—Motor Mechanism Co., capital stock, $25,000, to manufacture and deal in motor cars and parts; incorporators, E. Younger, F. Castle, H. O. Evans, H. E. Gray, S. E. Sackerman.

Cleveland, O.—Hall-Miller Automobile Co.; capital stock, $5,000; to deal in motor cars; incorporators, H. W. Bell, E. L. Bennings, F. C. Anselm, E. P. Eirich, C. L. Guthrie.

Cleveland, O. Auto Mart Co., capital stock, $10,000; to deal in and hire motor cars; incorporators, E. C. Pletz, W. L. Radcliffe, W. H. Hasselman, W. R. Wallace, L. C. Heimberger.

Danbury, Conn.—Fillow Auto Co.; capital stock, $30,000, to manufacture motor cars; incorporators, A. H. Fillow, J. W. Juengst, B. M. Fillow.

Dunkirk, N. Y.—Niagara Motors and Manufacturing Co., capital stock, $275,000, incorporators, E. J. West, M. M. Hedden, D. W. Fry.

Greensboro, S. C.—Reitzel Auto Service Co.; capital stock, $25,000; incorporators, O. C. Klingman, J. H. Reitzel, L. G. Klingman.

Indianapolis, Ind.—Hunter-Hammond Auto Co.; capital stock, $12,000; to manufacture motor cars and accessories.

Kansas City, Mo. Four Points Garage, Livery and Repair Co.; capital stock, $2,000; incorporators, J. L. Brown, B. F. Brown, D. I. White.

New York—Twelfth Street Garage Co.; capital stock, $60,000; incorporators, D. G. McOtter, W. H. Devlin, Sr., George M. Hamilton.

New York—Miller-Brisben Co.; capital stock $25,000, to deal in motor cars; incorporators, W. A. Miller, I. Jaffee, J. McN. Brisben.

New York—Gasoline Safety Appliance Co.; capital stock, $150,000; to manufacture and deal in gasoline.

New York—Foreign and Domestic Automobile Repair Co.; capital stock, $10,000, incorporators, L. O. Rothschild, Max Kaplan, Otto A. Deffaa.

Pittsfield, Mass.—J and B Mfg. Co.; capital stock, $25,000; directors, F. A. Knight, E. B. Jacobson, J. J. Whittlesey.

Racine, Wis. Racine Auto Tire Co.; capital stock, $75,000; to manufacture pneumatic tires; incorporators, L. J. Elliott, C. Wright, M. E. Walker.

Richmond, Ky.—Madison Garage; capital stock, $2,000; incorporators, R. Montgomery, F. E. Chase, M. C. Kellogg.

San Antonio, Tex.—Knight Motor Car Co.; capital stock, $10,000, to deal in motor cars and accessories, incorporators, H. L. Knight, A. H. Danforth, A. H. Elmore.

Shelbyville, Ky.—Fawkes, Pulliam & Graham; capital stock, $3,300, to conduct a garage, incorporators, E. B. Graham, G. Fawkes, H. Pulliam.

Stoughton, Mass. Panther Rubber Mfg. Co.; capital stock, $150,000, directors, F. Bernstein, W. Bernstein, M. Marcus.

Wilmington, Del.—Macandaruba Tire Filler Co.; capital stock, $1,500,000; incorporators, H. R. Ewart, C. J. Jacobs, H. W. Davis.

Wilmington, Del. Rota Engine Co., capital stock, $100,000, to manufacture engines and motors.

Chicago Show Space Assigned by Miles

Ninety-Six Pleasure Car Makers and Sixty-Two Truck Concerns In

CHICAGO, Nov. 25—Closing his books, Samuel A. Miles, general manager of the National Association of Automobile Manufacturers, announces every inch of space in the pleasure car show at Chicago has been sold, while everything in the commercial show is sold except some spaces in the basement. Ninety-six pleasure car makers will exhibit, while there are to be sixty-two commercial exhibits. The Coliseum proper will house thirty-nine makers the first week and thirty-four truckmen the second week; in the annex there will be eight pleasure car displays and nine trucks; the armory will take care of thirty-one makes of pleasure cars and nineteen trucks, while eighteen pleasure-car makers will be in the Coliseum basement.

ATLANTA SHOW MADE MONEY

Atlanta, Ga., Nov. 23—The Atlanta show ended tonight. The accounts have not been cast yet, but it appears that enough money will be in the treasury to pay all expenses, refund to each exhibitor one-half of the money he spent for space and still leave $2,500 in the treasury for a working fund.

The show was more economically run this year than last, but, thanks to good weather, to prosperity in the south, to the fine display of cars and to much publicity and because it was given right at the start of the southern buying season, it drew immeasurably larger crowds than ever before.

A feature of the show was the announcement made while it was in progress that two new southern branch houses would be opened in Atlanta—the Cartercar and the Jackson. Both will have show rooms on Peachtree street and service stations elsewhere. This will give Atlanta seventeen direct factory branches.

A census of the show gave 104 cars on exhibition.

TOLEDO WOULD MOTORIZE

Toledo, O., Nov. 25—Safety Director J. J. Mooney has requested the council to authorize the motorizing of Toledo's fire department, and that body now has the matter under advisement. The cost of the undertaking is estimated at $185,000, and it is estimated that the cost of operation would pay the interest on the debt and wipe out the indebtedness in 15 years. According to Mr. Mooney, there are between 106 and 112 horses in the department, maintained at an annual expense of $25,000. Fire Chief Mayo estimates that better service can be maintained with thirty-four pieces of motor-driven apparatus than with forty-five horse-drawn vehicles.

INDIANAPOLIS PROGRESSIVE

Indianapolis, Ind., Nov. 23—In a report covering a survey of the fire-fighting facilities of Indianapolis, the National Board of Fire Underwriters has recommended that all new apparatus bought for the department and all apparatus of companies making long runs on the first alarm shall be motor apparatus. The city has already adopted a policy of buying motor apparatus as new apparatus is needed and to gradually displace horse-drawn apparatus. Several pieces of motor apparatus have been in use in the department for some time and have given excellent satisfaction.

Pleasure and Commercial Vehicle Manufacturers Who Willl Exhibit at Chicago

PASSENGER VEHICLE DEPARTMENT — COLISEUM, MAIN FLOOR

Winto Motor Carriage Co.....Cleveland, O.
F. B. Stearns Co.....Cleveland, O.
Dayton Motor Car Co.....New York City
Stevens-Duryea Co....Chicopee Falls, Mass.
Flanders Motor Co.....Detroit, Mich.
Peerless Motor Car Co.....Cleveland, O.
Bartholomew Co.....Peoria, Ill.
Buick Motor Co.....Flint, Mich.
Reo Motor Car Co.....Lansing, Mich.
Studebaker Corporation.....Detroit, Mich.
H. H. Franklin Mfg. Co.....Syracuse, N. Y.
Locomobile Co. of America.Bridgeport, Conn.
Packard Motor Car Co..... Detroit, Mich.
National Motor Vehicle Co.Indianapolis, Ind.
Premier Motor Mfg. Co...Indianapolis, Ind.
Hudson Motor Car Co.....Detroit, Mich.
Haynes Automobile Co.....Kokomo, Ind.
Pierce-Arrow Motor Car Co...Buffalo, N. Y.
Cadillac Motor Car Co.....Detroit, Mich.
Maxwell-Briscoe Motor Co..New York City
Pope Mfg. Co.....Hartford, Conn.
Willys-Overland Co.....Toledo, O.
Olds Motor Works.....Lansing, Mich.
Chalmers Motor Co.....Detroit, Mich.
Auburn Automobile Co.....Auburn, Ind.
Thomas B. Jeffery Co.....Kenosha, Wis.
Fiat.....Poughkeepsie, N. Y.
Nordyke & Marmon Co....Indianapolis, Ind.
American Locomotive Co.....New York City
White Co.....Cleveland, O.
Cole Motor Car Co.....Indianapolis, Ind.
Pierce Motor Co.....Racine, Wis
Columbia Motor Car Co.....New York City
Selden Motor Vehicle Co....Rochester, N. Y.
Lozier Motor Co.....Detroit, Mich.
Oakland Motor Car Co.....Pontiac, Mich.
Moon Motor Car Co.....St. Louis, Mo.
Mitchell-Lewis Motor Car Co...Racine, Wis.
Imperial Automobile Co.....Jackson, Mich.

COLISEUM ANNEX, MAIN FLOOR

Kissel Motor Car Co.....Hartford, Wis.
American Motors Co.....Indianapolis, Ind.
Hupp Motor Car Co.....Detroit, Mich.
Garford Co.....Elyria, O.
Cartercar Co.....Pontiac, Mich.
Knox Automobile Co.....Springfield, Mass.
Velie Motor Vehicle Co.....Moline, Ill.
Inter-State Automobile Co.....Muncie, Ind.

FIRST REGIMENT, MAIN FLOOR

Borland-Grannis Co.....Chicago
Waverley Co.....Indianapolis, Ind.
Flanders Mfg. Co.....Detroit, Mich.
Ohio Electric Car Co.....Toledo, O.
Argo Electric Vehicle Co.....Saginaw, Mich.
Baker Motor Vehicle Co.....Cleveland, O.
Columbus Buggy Co.....Columbus, O.
Anderson Electric Car Co.....Detroit, Mich.
Woods Motor Vehicle Co.....Chicago
Jackson Automobile Co.....Jackson, Mich.
Rauch & Lang Carriage Co....Cleveland, O.
Moline Automobile Co.....East Moline, Ill.
Buffalo Electric Vehicle Co....Buffalo, N. Y.
Austin Automobile Co...Grand Rapids, Mich.
Broc Electric Vehicle Co.....Cleveland, O.
Matheson Automobile Co..Wilkes-Barre, Pa.
Staver Carriage Co.....Chicago
Pullman Motor Car Co.....York, Pa.
Krit Motor Car Co.....Detroit, Mich.
Westcott Motor Car Co.....Richmond, Ind.
McFarlan Motor Car Co....Connersville, Ind.
Great Western Automobile Co.....Peru, Ind.
Speedwell Motor Car Co.....Dayton, O.
Ideal Motor Car Co.....Indianapolis, Ind.
Abbott Motor Co.....Detroit, Mich.
Michigan Motor Car Co....Kalamazoo, Mich.
Regal Motor Car Co.....Detroit, Mich.
Cutting Motor Car Co.....Jackson, Mich.
Kline Motor Car Corporation..Richmond, Va.
Motor Car Mfg. Co.....Indianapolis, Ind.
Paige-Detroit Motor Car Co...Detroit, Mich.

COLISEUM BASEMENT

Edwards Motor Car Co.....New York
Herreshoff Motor Co.....Detroit, Mich.
Norwalk Motor Car Co..Martinsburg, W. Va.
Metz Co.....Waltham, Mass.
D. J. Bergdoll Motor Co...Philadelphia, Pa.
George W. Davis Carriage Co.Richmond, Ind.
Elkhart Carriage & Harness Mfg. Co.....Elkhart, Ind.
Midland Motor Co.....Chicago
Chicago Electric Motor Car Co.....Chicago
Crow Motor Car Co.....Elkhart, Ind.
W. H. McIntyre Co.....Auburn, Ind.
Standard Electric Car Co.....Jackson, Mich.
Colby Motor Co.....Mason City, Ia.
W. A. Paterson Co.....Flint, Mich.
Marathon Motor Works.....Nashville, Tenn.
Henderson Motor Car Co...Indianapolis, Ind.
Church-Field Motor Co.....Sibley, Mich.
Mercer Automobile Co.....Trenton, N. J.

COMMERCIAL VEHICLE SECTION—FIVE COLISEUM, MAIN FLOOR

Studebaker Corporation.....Detroit, Mich.
Autocar Co.....Ardmore, Pa.
Thomas B. Jeffery Co.....Kenosha, Wis.
Selden Motor Vehicle Co....Rochester, N. Y.
Buffalo Electric Vehicle Co....Buffalo, N. Y.
Reo Motor Car Co.....Lansing, Mich.
Federal Motor Truck Co.....Detroit, Mich.
Velie Motor Vehicle Co.....Moline, Ill.
Hupp Motor Car Co.....Detroit, Mich.
Buick Motor Co.....Chicago
Kelly Motor Truck Co.....Springfield, O.
Peerless Motor Car Co.....Cleveland, O.
Kissell Motor Car Co.....Hartford, Wis
International Motor Co.....New York City
Adams Bros. Co.....Findlay, O.
Speedwell Motor Car Co.....Dayton, O.
Waverley Co.....Indianapolis, Ind.
Locomobile Co. of America.Bridgeport, Conn.
Gramm Motor Truck Co.....Lima, O.
Pierce-Arrow Motor Car Co....Buffalo, N. Y.
Pope Mfg. Co.....Hartford, Conn.
American Locomotive Co....New York City
Walker Vehicle Co.....Chicago
U. S. Motor Truck Co.....Cincinnati, O.
Garford Co.....Elyria, O.
General Motors Truck Co.....Pontiac, Mich.
Reliance Motor Truck Co.....Pontiac, Mich.
Knox Automobile Co.....Springfield, Mass.
Krebs Commercial Car Co.....Clyde, O.
Clark Delivery Car Co.....Chicago
Old Reliable Motor Truck Co.....Chicago
Durant-Dort Carriage Co., Flint Motor Car Dept.....Flint, Mich.
Dayton Auto Truck Co.....Dayton, O.
Sternberg Mfg. Co.....Milwaukee, Wis

COLISEUM ANNEX, MAIN FLOOR

Chase Motor Truck Co.....New York City
Service Motor Car Co.....Wabash, Ind.
Standard Motor Truck Co.....Detroit, Mich.
Transit Motor Truck Co., Inc.Louisville, Ky.
Dart Mfg. Co.....Waterloo, Ia.
M. & P. Electric Vehicle Co....Detroit, Mich.
Lippard-Stewart Motor Car Co.Buffalo, N. Y.
Universal Motor Truck Co.... Detroit, Mich.
Bowling Green Motor Car Co.....Bowling Green, O.

FIRST REGIMENT ARMORY, FIRST FLOOR

General Vehicle Co...Long Island City, N. Y.
Avery Co.....Peoria, Ill.
Packard Motor Car Co.....Detroit, Mich.
White Co.....Cleveland, O.
Baker Motor Vehicle Co.....Cleveland, O.
A. O. Smith Co.....Milwaukee, Wis.
Schacht Motor Car Co.....Cincinnati, O.
Lauth-Juergens Motor Car Co..Fremont, O.
Chicago Pneumatic Tool Co.....Chicago
National Motor Truck Co.....Bay City, Mich.
Sanford Motor Truck Co.....Syracuse, N. Y.
International Harvester Co.....Chicago
Commerce Motor Car Co.....Detroit, Mich.
Brown Commercial Car Co.....Peru, Ind.
Four Wheel Drive Automobile Co.....Clintonville, Wis.
Hardwood-Barley Mfg. Co.....Marion, Ind.
Bessemer Motor Truck Co....Grove City, Pa.
D. F. Poyer & Co.....Menominee, Mich.
Gramm-Bernstein Co.....Lima, O.

Beautify Garden and Palace for Show

New Yorkers Lavish in Decorating the Two Big Buildings

NEW YORK, Nov. 25—In order to make the new Grand Central palace more attractive and appropriate for a motor show than ever before, the entire interior, including all of the floors, is to be redecorated for the national motor car show, January 11 to 25 next. Madison Square garden also will have an entirely new scheme of decoration. On the walls of the main floor of the palace will be several Long Island scenes, a view of the magnificent Delaware Water Gap, views in the Berkshires, and a painting of scenes along the Hudson at West Point. On the mezzanine floor western views will be found, including the Grand canyon of the Colorado, gorges and passes in the Rocky mountains, California vistas, sections of the cattle country and prairies. The balcony will be devoted to the sunny south and paintings of the famous beach at Ormond, Fla., where numerous world's speed records were made, Savannah and other Dixie points of interest will be depicted.

These paintings will adorn the walls about the picturesque pergola setting in which the cars are to be shown. There will be much trellis work, flowers in profusion, and a general outdoor atmosphere in which the cars will show to advantage.

Details of the Madison Square garden decorations have not been made public, but the color scheme is to be worked out in gold and white.

There will be an added feature at the New York show. During the second week, beginning January 20, which is devoted to commercial vehicles, it has been decided to hold a machine tool exhibit.

List of Accessory Concerns Which Will Exhibit Both Weeks of the Chicago Show

COMMERCIAL VEHICLE SECTION—PASSENGER VEHICLE SECTION
COLISEUM GALLERY

Havoline Oil Co.....New York
Chicago Drop Forge & Fdy. Co.....Chicago
Rutenber Motor Co.....Marion, Ind
Imperial Brass Mfg. Co.....Chicago
Standard Roller Bearing Co. Philadelphia, Pa.
Atwater-Kent Mfg. Wks...Philadelphia, Pa.
C. F. Ham Mfg. Co.....Rochester, N. Y.
Lefever Arms Co.....Syracuse, N. Y.
Globe Machine & Stamping Co..Cleveland, O.
U. S. Light & Heating Co.....New York
N. Y. & N. J. Lubricant Co.....New York
Weed Chain Tire & Grip Co.....New York
Vesta Accumulator Co.....Chicago
Whitney Mfg. Co.....Hartford, Ct.
Heinze Electric Co.....Lowell, Mass.
Warner Instrument Co.....Beloit, Mich.
Ajax-Grieb Rubber Co.....New York
A. O. Smith Co.....Milwaukee, Wis.
McCord Mfg. Co.....Detroit, Mich.
Republic Rubber Co.....Youngstown, O.
Joseph Dixon Crucible Co...Jersey City, N. J.
Hyatt Roller Bearing Co.....Newark, N. J.
Motz Tire & Rubber Co.....Akron, O.
Wm. Cramp & Sons Eng. Co.....Philadelphia, Pa.
Timken-Detroit Axle Co.....Detroit, Mich.
Timken Roller Bearing Co.....Canton, O.
Fisk Rubber Co.....Chicopee Falls, Mass.
Badger Brass Mfg. Co.....Kenosha, Wis.
Goodyear Tire & Rubber Co.....Akron, O.
Veeder Mfg. Co.....Hartford, Ct.
U. S. Tire Co.....New York
Gray & Davis.....Amesbury, Mass.
B. F. Goodrich Co.....Akron, O.
Standard Welding Co.....Cleveland, O.
National Tube Co.....Pittsburgh, Pa.
Motsinger Device Mfg. Co.....Pendleton, O.
Warner Gear Co.....Muncie, Ind.
Splitdorf Electrical Co.....Newark, N. J.
Diamond Chain & Mfg. Co..Indianapolis, Ind.
Vacuum Oil Co.....New York
American Ball Bearing Co.....Cleveland, O.
J. H. Williams Co.....Brooklyn, N. Y.
A. W. Harris Oil Co.....Providence, R. I.
Hartford Suspension Co....Jersey City, N. J.
Baldwin Chain & Mfg. Co...Worcester, Mass.
Continental Motor Mfg. Co..Muskegon, Mich.
Brown-Lipe Gear Co.....Syracuse, N. Y.
Spicer Mfg. Co.....Plainfield, N. J.
Weston-Mott Co.....Flint, Mich.
Pittsfield Spark Coil Co.....Dalton, Mass.
Firestone Tire & Rubber Co.....Akron, O.
Auto Parts Mfg. Co.....Muncie, Ind.
Pennsylvania Rubber Co.....Jeannette, Pa.
Remy Electric Co.....Anderson, Ind.
Swinehart Tire & Rubber Co.....Akron, O.
Gabriel Horn Mfg. Co.....Cleveland, O.
Consolidated Rubber Tire Co.....New York
Wheeler & Schebler.....Indianapolis, Ind.
Diamond Rubber Co.....Akron, O.
Westinghouse Electric & Mfg. Co.....East Pittsburgh, Pa.
Electric Storage & Battery Co...Philadelphia
Oliver Mfg. Co.....Chicago
S. F. Bowser & Co.....Ft. Wayne, Ind.
Edmunds & Jones Mfg. Co....Detroit, Mich.
Kokomo Electric Co.....Kokomo, Ind.
Byrne, Kingston & Co.....Kokomo, Ind.
Link-Belt Co.....Philadelphia
Stromberg Motor Devices Co.....Chicago

COLISEUM ANNEX, SECOND FLOOR

Willard Storage Battery Co....Cleveland, O.
Wolverine Lubricants Co.....New York
Warner Mfg. Co.....Toledo, O.
Muncie Gear Works.....Muncie, Ind.
Baldwin Steel Co.....Lafayette, Ind.
Esterline Co.....
Texas Co.....New York
Gemmer Mfg. Co.....Detroit, Mich.
Edison Storage Battery Co.....West Orange, N. J.
Stewart & Clark Mfg. Co.....Chicago
Cotta Transmission Co.....Rockford, Ill.
Royal Equipment Co.....Bridgeport, Conn.
Briggs Magneto Co.....Elkhart, Ind.
Buda Co.....Harvey, Ill.
Waukesha Motor Co.....Waukesha, Wis.
United Rim Co.....Akron, O.
American Bronze Co.....Berwyn, Pa.
Findeisen & Kropf Mfg. Co.....Chicago
National Coil Co.....Lansing, Mich.
Ross Gear & Tool Co.....Lafayette, Ind.
Kells Mfg. Co.....New York
Bower Roller Bearing Co.....Detroit, Mich.
New Miller Carburetor Co..Indianapolis, Ind.
Detroit Lubricator Co.....Detroit, Mich.
Ingersoll-Rand Co.....New York
Sheldon Axle Co.....Wilkes-Barre, Pa.
James L. Gibney Rubber Co....Philadelphia
Garage Equipment Mfg. Co.Milwaukee, Wis.
Gould Storage Battery Co.....New York
Ignition Starter Co.....Detroit, Mich.
Empire Tire Co.....Trenton, N. J.
A. Schrader's Son, Inc.....New York
Herz & Co.....New York
Pantasote Co.....New York
Cleveland Hardware Co.....Cleveland, O.
Homo Company of America.....Jersey City, N. J.
Champion Ignition Co.....Flint, Mich.
Stutz Auto Parts Co.....Indianapolis, Ind.

Note: Exhibitors in this section occupy space, with the exception of Herz & Co. and the Cleveland Hardware Co. are in both the passenger and commercial vehicle sections.

COLISEUM ANNEX, SECOND FLOOR—PASSENGER VEHICLE WEEK ONLY

Federal Rubber Mfg. Co.....Cudahy, Wis.
White & Bagley Co.....Worcester, Mass.
Seamless Rubber Co.....New Haven, Conn.
Connecticut Telephone & Electric Co.....Meriden, Conn.
Michelin Tire Co.....Milltown, N. J.
McCue Co.....Buffalo, N. Y.
Valentine & Co.....New York City
Hoffecker Co.....Boston, Mass.
C. Cowles & Co.....New Haven, Conn.
Lovell-McConnell Mfg. Co.....Newark, N. J.
Randall-Faichney Co.....Boston, Mass.
G. Piel Co.....Long Island City
Dean Electric Co.....Elyria, O.
Kellogg Mfg. Co.....Brooklyn, N. Y.
Doehler Die Casting Co.....Rochester, N. Y.
Racine Rubber Co.....Racine, Wis.
Sparks-Withington Co.....Jackson, Mich.
Lee Tire & Rubber Co.....Conshohocken, Pa.
C. A. Shaler Co.....Waupun, Wis.
J. H. Sager Co.....Rochester, N. Y.
Standard Thermometer Co....Boston, Mass.
Marathon Tire & Rubber Co.....Cuyahoga Falls, O.
Universal Tire Protector Co....Angola, Ind.
Walpole Rubber Co.....Boston, Mass.
New Jersey Car Spring & Rubber Co.....Jersey City, N. J.
Hess Spring & Axle Co.....Carthage, O.
Endurance Tire & Rubber Co.New York City
Schoen-Jackson Co.....Media, Pa.
Double Fabric Tire Co.....Auburn, Ind.
Simms Magneto Co.....New York
Batavia Rubber Co.....Batavia, N. Y.
John L. G. Dykes Co.....Chicago
Vorhees Rubber Mfg. Co...Jersey City, N. J.
International-Acheson Graphite Co.....Niagara Falls, N. Y.
Automobile Supply Mfg. Co..Brooklyn, N. Y.
Leather Tire Goods Co...Niagara Falls, N. Y
Adam Cook's Sons.....New York
Coes Wrench Co.....Worcester, Mass.

PASSENGER VEHICLE SECTION—FIRST REGIMENT ARMORY GALLERY

Horseless Age Co.....New York
Perfection Spring Co.....Cleveland, O.
S. Breakstone.....Chicago
Arminger Chemical Co.....Chicago
Motor.....New York
Mayo Mfg. Co.....Chicago
Tuthill Spring Co.....Chicago
Barco Brass & Joint Co.....Chicago
Peck Wheel Co.....Chicago
National Motor Supply Co.....Cleveland, O.
Automobile Journal Pub. Co.Pawtucket, R. I.
Vanguard Mfg. Co.....Joliet, Ill.
Racine Mfg. Co.....Racine, Wis.
L. P. Halladay Co.....Chicago
Motor Car Publishing Co...Kansas City, Mo.
Brown Co.....Syracuse, N. Y.
S. K. F. Ball Bearing Co.....New York
E-C Sales Co.....Chicago
New York Coil Co.....Chicago
Grip Nut Co.....Chicago
Rhineland Machine Works Co.....New York
Marburg Bros., Inc.....New York
Economy Equipping Co.....Chicago
Pittsburgh Model Engine Co.....Peru, Ind.
Sarco Engineering Co.....New York
William L. Tobey.....Boston, Mass.
Metal Stamping Co...Long Island City, N. Y.
E. Edelmann & Co.....Chicago
Norma Co. of America.....New York
Illinois V-Ray Sales Co.....Chicago
Charles O. Tingley & Co.....Rahway, N. J.
Morrison-Ricker Mfg. Co.....Grinnell, Ia.
Chilton Co.....Philadelphia
Motor Age.....New York
Longdin-Brugger Co.....Fond du Lac, Wis.
Automatic Motor & Engineering Co..Chicago
U. S. Ball Bearing Mfg. Co....Oak Park, Ill.
Northway Motor & Mfg. Co..Detroit, Mich.
Automobile.....New York
Motor Vehicle Publishing Co.....New York
Motor World Publishing Co.....New York

COMMERCIAL VEHICLE SECTION—FIRST REGIMENT ARMORY GALLERY

Horseless Age Co.....New York
Perfection Spring Co.....Cleveland, O.
Merchant & Evans Co.....Philadelphia
Federal Chain & Mfg. Co..Springfield, Mass.
Motor.....New York
Highland Body Co.....Elmwood Place, O.
Tuthill Spring Co.....Chicago
Service Recorder Co. of Illinois.....Chicago
Detroit Puncture Co.....Detroit, Mich.
Never-Skid Mfg. Co.....New York
Sewell Cushion Wheel Co.....Detroit, Mich.
Automobile Journal Publishing Co.....Pawtucket, R. I.
Rhineland Machine Works Co.....New York
Marburg Bros., Inc.....New York
Economy Equipping Co.....Chicago
Pittsburgh Model Engine Co.....Peru, Ind.
Sarco Engineering Co.....New York
Semple S. Scott.....Chicago
Rich Tool Co.....Chicago
Harrow Spring Co.....Milwaukee, Wis.
Cleveland Worm & Gear Co....Cleveland, O.
Norma Co. of America.....New York
Lavinge Gear Co.....Corliss, Wis.
Polack Tyre & Rubber Co.....New York
Torbensen Gear & Axle Co...Newark, N. J.
Chilton Co.....Philadelphia
Motor Age.....New York
Philadelphia Storage Battery Co.Philadelphia
Automatic Motor & Engineering Co..Chicago
Automobile.....New York

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For the Man Who Drives

WHEN will the Utopian car arrive, the car fitted with a satisfactory top which one man can put up or take down without crushing his fingers, or scratching the sides of the car body, the car that will not have its entire exterior with its seventeen coats of finish, defaced with spare tires, spare rims or extra wheels, and the car that can be jacked up without ruining a suit of clothes or grovelling in the dust of the road or the city street?

SUCH a car is needed, and worse still our makers are going quite slowly in that direction. As a matter of fact the majority of our makers are looking to the accessory man to solve many of their problems, just as today they are selling cars on the accessories they carry rather than on inherent features of superiority. The full-dinner pail of equipment has done more to dispose of the majority of low and medium-priced cars during the last season than the good points of motor design or transmission features.

THE top is in grave need of refinement. Today it keeps the rain out, but it ends there. To put it up, to lower it and to put on the slip cover are jobs that call for two adults, then what hope is there for the lone female who has aspirations and ability to drive her car but who finds the top one of the most cantankerous parts of the whole outfit.

SOME solutions are in sight and they are not coming from the car makers, rather from the inventive accessory man. The satisfactory top must have two features: first, ability to be raised or lowered with ease by one person, and second, some ready method of protecting it when folded instead of covering it with the glove-fitting slip cover now in general vogue but so generally left off. Solutions are in sight: The slip cover may be eliminated by incorporating in the body a receptacle around the top of the tonneau into which the top can drop when folded so that nothing remains but to button a flap covering in place, and the car will not exhibit the slightest semblance of being top equipped. There is not any reason why this cannot be carried still further—the body is quite a flexible portion of the car, and it offers sufficient latitude not only to contain the top when folded but also the spare tires or wheels.

THE problem of a one-man top is also on the highway of solution, and again the accessory man is to the fore. We may look to those should-be engineers who have designed side curtains that can be opened or closed without creeping outside underneath them. The one-man top can be made much lighter than many of the present vintage, and it must permit of raising or lowering from either the right or the left side. One or two foreign makers have recently exhibited at Olympia tops which fill these requirements to a major extent, but unfortunately some of them have been too heavy, and with others the appearance has been too unorthodox to assure any ready degree of acceptance.

THE demountable rim and demountable wheel are rapidly eradicating the tire nightmare, but the jack can be more or less improved. To get the jack under the rear axle of many cars is anything but an easy problem. If the road surface is soft or wet the trouble is doubled. One or two apparently satisfactory jacks were tried on the market a year ago. Mechanically they were entirely satisfactory and they largely overcame the difficulty of having to get onto the road to insert the jack and elevate it, but the makers soon discovered that the public would not accept it at the price and it was withdrawn. It would greatly facilitate matters if a score of the manufacturers would remember in designing the back axle that the car will be shod with pneumatic tires and that occasionally these tires will puncture or blow out and that when such happens a jack generally has to be used to elevate the wheel. Keeping this in mind a small boss could be formed on the housing, making a suitable anchorage for the jack. Something similar at the front axle would be equally readily fitted and would serve a great good. These little things would aid much in adding to the owner's pleasure in the use of his car.

Smaller Motors

NINETEEN hundred and fourteen will witness smaller motors in many of the American cars than are used in them for next season. This trend of construction has been as the wind stirring in the tree tops for several months, in fact, years. It was 2 years ago when makers began carrying our motor refinements to secure additional power instead of adding more inches to the cylinder bore or the stroke of the piston. But the end is not yet. The average motor size for 1913 gives promise of being slightly under that of the present season, the reduction may be quite small but will prove sufficient to indicate the direction of the wind.

EUROPE has been working consistently for smaller motors and so continual has the pruning process been that today a motor with 4-inch bore is considered a big motor. And the makers of high-powered cars have practically dropped all of their big models, this change being particularly apparent with several of the excessively high-powered six-cylinder designs that were touted so broadly a couple of seasons ago. Today they are on the toboggan in Europe and the small-powered, high-efficiency type is taking their place.

THE fact that the Indianapolis speedway for its 500-mile race next year has already announced a maximum piston displacement of 450 cubic inches, instead of 600 cubic inches, which has been the size ever since the conception of the race, is a practical acknowledgment of there not being sufficient available cars of the 600-cubic inch capacity, and in the same breath it is a further acknowledgement that smaller motored vehicles are capable of practically as great sustained speeds as the larger monsters, who wear out tires with such persistent regularity.

THE piston displacement limit set by the owners of the Indianapolis speedway will without doubt be accepted by the Elgin authorities who are now discussing the use of 450 cubic inches as the maximum for the Elgin national trophy. With these two premier events running under the 450 banner it is an assured success that the small motor will receive the greatest boom in its history in America, a boom sufficient to set many of the manufacturers thinking of the folly of burning up gasoline and tires to accomplish what can be done with much greater economy through the use of smaller motors.

French Will Run Grand Prix Anyway

Entries Re-Opened and Race Will Surely Be Put On in 1913

PARIS, Nov. 15—After being buried, the French grand prix race has been revived, the Automobile Club of France deciding to hold the race, whatever the number of starters, and to admit entries at ordinary fees until December 31, and at double fees until March 31. The race will be held during the first fortnight in July; the place has not yet been selected.

At the present time there are seventeen entries, the firms being Sunbeam, Delage, Peugeot, Schneider, Itala, with a valveless model; Mathis, Mercedes and Opel. In an interview with a Motor Age representative, Chevalier Rene de Knyff, president of the sporting committee of the Automobile Club of France, gave it as his opinion that with the extended time for receiving entries the total number would be forty-five or probably forty starters, thus assuring a most interesting race.

It was recognized that the original decision to close the lists at the end of October was a mistake, for a number of firms were unable to decide whether they would be able to compete at such an early date, and even those who had entered were unable to commence the construction of cars until they had received assurance that the race would really be held.

A side light on the reasons which led the club to revive the grand prix, after having obtained only sixteen out of the necessary forty entries, is given by L'Echo des Sports.

"The real reason why the Automobile Club of France has decided to preserve its grand prix is the attitude of the newspaper L'Auto," the paper says. "Once more our contemporary has earned the hearty thinks of the motor industry. Without it the grand prix certainly would have been dead and buried. It must not be supposed that this is a joke; it may be a little ironical, but that is all. We can declare today, without fear of contradiction, that L'Auto was not expecting the results it has provoked. All that it hoped for was the burial of the grand prix, although it took care not to give public expression to that hope. It would have followed the funeral procession with tears and lamentations; it would have accompanied the defunct as far as the cemetery. Then, having taken off its black coat, it would have rolled up its sleeves and given itself up heart and soul to the triumph of its own race, that race which was announced in all the majesty of big head lines and leaded matter in the issue of the paper declaring the certain abandonment of the grand prix, dead with only sixteen out of the necessary forty entries. It was a note of defiance which awoke the club to action. Without this note the club would have been content to allow its grand prix to sleep its eternal sleep. Instead, it rushed into the fray, taking a decision which has earned for it the compliments of all lovers of sport."

The 3-liter race, to be held by L'Auto, has been fixed for Sunday, June 29, the course not yet being decided on. Present entries are Peugeot and Delage, but the list does not close until March, and it is confidently expected that between thirty and forty cars will be secured. The rules for the 3-liter race have already been in force 2 years; next season will be their last application, for Charles Faroux, who is responsible for the rules and for the organization of the race, considers that all the lessons of the 3-liter race will have been learned after the contest next June.

CASE WINS IN EUROPE

Paris, Nov. 12—In the 1912 south Russian endurance run, held along the shores of the Black sea from Odessa to Sevastopol and return, an American Case car driven by Penistan finished the test without a single penalty, and was awarded the first prize of the Russian Imperial Automobile Society. The field of competitors included Mercedes, Benz, Opel, Dixi, Lorraine-Dietrich, Windhoff, Adler and Fiat. This same car was awarded the prize given by the city of Moscow for the best speed trials in that city.

Coming Motor Events

November 28-29—Track meet, Richmond Automobile Club, Richmond, Va.
December 2-3—Annual meeting American Automobile Association, Chicago.

SHOWS

November 26-30—Show at Grand Rapids, Mich.
December 7-22—Paris salon.
December 16-21—Show at Seattle, Wash.
January 2-10—Importers' Salon, Hotel Astor, New York.
January 4-11—Cleveland.
January 4-11—Montreal.
January 11-18—New York pleasure car show; Automobile Board of Trade; Madison Square Garden and Grand Central Palace.
January 11-22—Brussels, Belgium.
January 20-25—New York truck show; Automobile Board of Trade; Grand Central Palace and Madison Square Garden.
January 20-25—Philadelphia.
January 20-25—Milwaukee, Wis.
January 21-26—Toledo Show.
January 22-25—Geneva, N. Y.
January 25-February 1—St. Johns, N. B.
January 25-February 1—Show at Providence, R. I.
January 26-February 1—Montreal, Canada.
January 27-February 1—Scranton, Pa.
January 27-February 1—Detroit.
January 27-February 1—Pleasure Show, Buffalo, N. Y.
January 30-February 1—Canandaigua, N. Y.
February 1-8—Chicago.
February 10-15—Chicago truck show.
February 10-15—Minneapolis.
February 11-15—Ottawa, N. Y.
February 15-22—Newark, N. J.
February 15-22—Albany, N. Y.
February 16-23—Richmond, Va.
February 17-22—Kansas City.
February 24-March 1—St. Louis, Mo.
February 24-March 1—Memphis, Tenn.
February 24-March 1—Cincinnati, O.
February 24-March 1—Omaha, Neb.
February 24-March 1—New Orleans, La.
February 26-March 1—Fort Dodge, Ia.
March 3-8—Pittsburgh.
March 8-15—Boston pleasure car show.
March 18-22—Truck show, Buffalo, N. Y.
March 19-26—Boston truck show.
March 24-29—Indianapolis.

HOOSIERS MAY REVISE LAW

Indianapolis, Ind., Nov. 25—It appears practically certain there will be some legislation affecting motor car interests when the Indiana legislature convenes in biennial session in January. The present motor car law was passed in 1905 and provides for a registration fee of $1 for each car, which registration need not be renewed. It also stipulates a speed of 8 miles an hour in business districts and 15 miles an hour in residence districts of cities and towns and of 20 miles an hour in the country.

Senator J. J. Netterville, of Anderson, already has prepared a bill providing annual license fees for motor cars, new speed regulations, and that the money collected from the licenses shall be distributed among the different counties for road building and repair purposes. It is estimated the license scheme would net from $250,000 to $300,000 a year.

An annual license fee of $10 for motor car manufacturers is proposed, as well as a fee of $5 a year for the first 2 years and $3 for each succeeding year for chauffeurs. For motor cars the licenses would be $5 for cars up to 25 horsepower; $10 for cars from 25 horsepower to 35 horsepower; $15 for cars from 35 horsepower to 50 horsepower, and $25 for cars above 50 horsepower.

The new speed regulations proposed for cities and towns is 10 miles an hour in business districts, 12 miles an hour in residence districts, 15 miles an hour in outlying districts and 25 miles an hour in the country.

DETROIT S. A. E. MEETS

Detroit, Mich., Nov. 25—The first real get-together meeting of the Detroit section of the Society of Automobile Engineers was staged at the Detroit Motor Boat Club house on Thursday evening, November 21. An informal dinner was served and there were 125 on hand to enjoy the repast. This is the largest gathering which has ever turned out for an affair of any nature given by the Detroit section. No engineering subjects were discussed, the object being to afford the members an opportunity to become better acquainted with one another. By offering social advantages to its members in addition to merely technical ones, it is hoped to gather attract members of the national body.

Flanders Manager of United Motors Co.

NEW YORK, Nov. 26—Announcement made this afternoon by Roberts Walker and W. E. Strong, receivers for the United States Motor Co., makes public the appointment of Walter E. Flanders as manager of the company and its five factory subsidiaries for the receivers and W. F. McGuire as assistant manager. They will have authority over all departments of the company except the auditing, accounting and treasury, which will be operated for the present by the incumbent forces.

Affairs of the United States Motor Co., now in receivership, are working out about as expected. There has been some delay in getting started on the manufacturing schedule of the Maxwell plants, but the receivers have just announced that the preliminary work has been concluded and that the flotation of the $1,500,000 of receivers' certificates will be undertaken shortly. It was found that another inspection of the plants had to be made and this served to delay proceedings.

Practically 96 per cent of the claims against the company has been filed with the designated depositary and the time for depositing stocks has been extended until December 9, when it is expected that about 60 per cent will have been impounded.

The course of the procedure has not all been smooth, however. Suit has been entered against the company in the New Jersey branch of the United States district court on behalf of three creditors whose claims aggregate about $5,000. The grounds for the action apparently are that the New York suit is invalid because the complainant company, the Brown & Sharpe Mfg. Co., is a Rhode Island corporation and the United States Motor Co. has its legal existence in New Jersey.

The apparent theory of the complainants in this case is based upon the same assumption as was the demurrer to the court's jurisdiction, which was informally filed in the New York suit. Judge Hough disposed of the claim by stating from the bench that in his opinion he did have jurisdiction. Whether or not there is any element of contempt of court in the New Jersey suit is a question that has stirred up considerable interest in New York.

Joline, Larkin & Rathbone, attorneys for the creditors of the company, are of the opinion that there will be no serious consequences as the result of the new suit. A serious consequence in the matter would be a delay in the scheduled sale and reorganization of the company.

RECEIVER FOR POSS NAMED

Detroit, Mich., Nov. 26—Affairs of the Poss Motor Co. were brought to a head last week with the filing of a petition in the United States district court before

Receivers Appoint Head Over Concern and Subsidiaries —McGuire Assistant

Judge Tuttle by the Detroit Foundry Co. and several other creditors, to have the Poss concern adjudicated a bankrupt. E. H. Rogers was appointed receiver, and the case referred to Lee E. Joslyn, referee. It is claimed by the petitioners that the Poss company is insolvent and that the plant has not been in operation for the past 3 or 4 months. It is further claimed that a number of judgments have been filed against the concern.

The Poss Motor Co. will contest the granting of the petition when it comes up in court again within 2 weeks, on the ground that with the help of the major creditors' committee which is now engaged with its affairs, it can be set on its feet. Reorganization plans are at present under way. It is stated that $150,000 new capital is needed and that half of this amount was in sight when the petition was filed by the minority creditors. It is further contended that the truck is a good one and can be sold as fast as manufactured, and that additional capital is what is needed to make the concern a paying proposition.

PREPARING FOR HUBER CASE

Detroit, Mich., Nov. 25—Preparations for the taking of testimony in the Emil Huber three-point suspension patent case brought by the North American Vehicle Co., owner of the patent, against the Detroit Taxicab and Transfer Co., which is being defended by the Kelly Motor Truck Co., maker of the trucks operated by the taxicab concern, are now under way. R. A. Parker, attorney for the plaintiff, states that in all probability the case will be begun in about 2 weeks, or as soon as the models which he is having prepared are completed. It will come before Judge Tuttle in the United States district court in this city.

W., C. & P. SALE APPROVED

New York, Nov. 26—Following the favorable action by the creditors of Wyckoff, Church & Partridge, Inc., the United States district court has issued an order approving the sale of the assets of the embarrassed corporation to Chester Griswold, Howard C. Dickinson and George W. Ellis. The assets will be turned over to the committee on Saturday, the creditors receiving $15,000 in cash in addition to certain credits that have been marshaled by the receiver, John S. Sheppard, Jr., which amount to between $20,000 and $30,000, all told. The settlement means something over 25 cents on the dollar.

The claim against the Driggs-Seabury Ordnance Corporation and the counter claim of that company, together with the property of Wyckoff, Church & Partridge, Inc., held by Driggs-Seabury, are not considered in the settlement. A corporation to continue the business is in process of formation and its details will be announced subsequent to the actual consummation of the court action.

WARREN CHANGES

Detroit, Mich., Nov. 23—At a meeting of the directors of the Warren Motor Car Co. on November 21, several changes were made in the personnel of the concern. Homer Warren was re-elected president; C. R. Wilson was made vice-president; F. T. Lewis, secretary, and L. M. Hamlin, treasurer. R. W. Allen, formerly secretary of the organization, was made general manager and assistant secretary and treasurer. Under the reorganization, the directors' committee consists of nine, as follows: Homer Warren, C. L. Wilson, C. H. Wilson, H. H. Bassett, S. G. Jencks, F. T. Lewis, John Mowe, G. Jahn and L. M. Hamlin.

OVERLAND STOCK ON SALE

New York, Nov. 25—Advance offering of the recently purchased block of $5,000,000 first preferred stock of the Willys-Overland Co. has been made by William Salomon & Co. The stock bears 7 per cent cumulative dividends. On the basis of last year's report of consolidated earnings, the company earned 66 per cent on the preferred issue. According to the Salomon announcement, the company sold 22,548 cars in the 1911-1912 season and for the year ending June 30, 1913, expects to put out 38,200. Figuring on that basis the bankers state that the company should earn full par value on the preferred issue offered.

UNDERWOOD BILL NOT DEAD

New York, Nov. 26—The Underwood bill revising the tariff on metals, which was passed by both houses of congress early this year and which encountered the veto of President Taft, probably will form the basis of the new legislation to be adopted at the special session of congress next spring.

The metal schedule incorporated in the Underwood measure provided for a tax of 6 per cent on pig iron, 10 per cent on alloys and from 15 to 35 per cent ad valorem on various kinds of manufactured and partially manufactured metals. These rates represent a downward revision of from 2 to 25 per cent.

The free list under the Underwood bill includes iron ore, hoop and band iron, barbed wire, fence wire, cut and wrought nails, tungsten ores and a few other items.

New York After 1913 Vanderbilt Race

Dealers Organize Association to Reclaim Classic for the East

NEW YORK, Nov. 26—The Motor Dealers' Contest Association of New York, composed of prominent members of the metropolitan trade, was formed Monday at a meeting attended by about forty. The purpose of the organization is to rehabilitate racing, road contests and tours and the main object that confronts it is the capture of the 1913 Vanderbilt cup race. The tentative plans of the association are to secure the race and run it on Long Island.

The association will be incorporated for $30,000 and the shares will be sold among the trade, the individual concerns of which are limited to three shares each. The machinery of the organization will consist of a board of directors, numbering eleven, an executive committee consisting of eight and three committees respectively on racing, road contests and touring to be named by the board.

Temporary Chairman John C. Wetmore has announced the following committee to canvass the trade for co-operative support: George H. Robertson, William C. Poertner, Edward McShane, E. Lescaris, J. C. Nicholls, A. J. Inderrieden and E. F. Korbel.

SUSPENDED BY A.A.A. CONTEST BOARD

New York, Nov. 23—At this week's meeting of the contest board of the American Automobile Association suspensions were handed out to some of the contestants in the recent around Lake Michigan reliability run of the Chicago Motor Club. For advertising stock car performances in a non-stock event the Moline Automobile Co. and the Staver Carriage Co., whose cars were the winners, were suspended from A. A. A. competition to June 1, 1913, while the Coey-Mitchell Auto Co. and the Stutz Motor Car Co., the latter Chicago agent for the Stutz, received a similar penalty for failing to start after entering and not being excused by the referee.

In the case of the appeal of the entrant of the Cadillac car in the Grand Rapids reliability run, the A. A. A. refused to overrule the finding of the referee of the Michigan event, who penalized the Cadillac 3 points because an outsider lifted the bonnet when the car was in control, the decision being based on the contention that the driver was negligent in permitting this.

PREPARING FOR COAST TRIP

Indianapolis, Ind., Nov. 25—The Indiana Automobile Manufacturers' Association, at a meeting in the Claypool hotel in this city last Thursday night, gave the plan for a run from Indianapolis to the Pacific coast its unqualified indorsement. This means that the Indiana manufacturers will make the trip, and July 4 was selected tentatively as the date for making the start from Indianapolis.

This trip will take the place of the Indiana four states tour, which was held this year and last. It is estimated that a car with two occupants can make the trip for $370, including the return trip by rail. The route has not been selected, and a committee is now working out this feature of the run.

H. O. Smith, of the Premier Motor Mfg. Co., has suggested that immediately following the arrival at the Pacific coast, exhibits of Indiana-made cars be held in Los Angeles, San Francisco, Portland and Seattle.

OHIO'S ROAD WORK IN 1912

Toledo, O., Nov. 25—State Highway Commissioner James Marker has recently returned from a motor tour of the state during which he made a complete inspection of the progress of road building in the different localities. The state has thus far this year contracted for the construction of more than 140 miles of roads, and between now and January 1 about 25 miles more will be let. The state roads this year are being constructed chiefly of water-bound macadam, concrete or brick. The old style gravel road has received scant attention from the state department. Less than 5 miles of this style road was laid by the state this year. More than 62 miles of water-bound macadam roads were contracted for and about 41 miles of concrete. More than 35 miles of brick roads were built and 10 miles of bituminous macadam laid.

ROAD MEETING IN NEBRASKA

Omaha, Neb., Nov. 25—The second annual convention of the Nebraska State Automobile Association was held at Lincoln on November 19 and 20. The reports read showed a very substantial growth during the past year.

B. A. George, president of the Lincoln Automobile Club, moved that the state secretary be instructed to invite eight Nebraska associations to appoint a committee of three from each association and confer with the legislative committee of the Nebraska State Automobile Association in order that all good roads interests in the state might unite upon a uniform highway commission bill, which it was planned shall be introduced at the coming session of the Nebraska state legislature.

The following officers were elected for the coming year: President, Dr. A. P. Overgaard, Fremont, Neb.; vice-president, Lee Huff, Omaha, Neb.; second vice-president, G. E. Parisoe, Minden, Neb.; third vice-president, G. E. Glatfelder, Central City, Neb.; treasurer, E. R. Wilson, Omaha, Neb.; secretary, O. C. Turner, Omaha, Neb.; directors, B. A. George, Lincoln; C. O. Johnson, Havelock; Lee Huff, Omaha; E. R. Wilson, Omaha; Dr. A. P. Overgaard, Fremont; I. E. Doty, David City; D. S. Dalby, Beatrice; Ray Harrison, Grand Island; E. H. Mason, Bloomfield.

An invitation by the Hall County Automobile Association to hold the next annual convention at Grand Island was unanimously accepted.

ANOTHER SPARK PLUG SUIT

New York, Nov. 26—Suit has been entered in the United States district court by the Rajah Auto Supply Co. against the American Auto Supply Co., charging infringement of the Mills patent, 825,856, covering porcelain spark plugs. While the patent itself forms the basis of the suit, the main contention is that the defendant company made a practice of advertising and selling the porcelain parts of spark plugs with which to repair Rajah plugs.

GRABOWSKY COMPANY BANKRUPT

Detroit, Mich., Nov. 25—The Grabowsky Power Wagon Co. was adjudicated a bankrupt by Judge Tuttle in the United States district court on November 22. The concern will be operated by the receiver, the Federal Trust Co., until December 5, when a meeting of the creditors will take place, at which bids for the plant and equipment will be considered by the creditors of the concern.

DURANT CHEVROLET PRESIDENT

Detroit, Mich., Nov. 25—The following officers were elected at a recent meeting here of the board of directors of the Chevrolet Motor Co., Flint, Mich.: W. C. Durant, president; J. D. Port, vice-president; W. H. Little, second vice-president; Dr. E. R. Campbell, treasurer; C. R. Hathaway, secretary; W. M. Murphy, assistant secretary, and F. A. Aldrich, assistant treasurer.

DAIMLER FILES SCHEDULES

New York, Nov. 26—Schedules in bankruptcy of the Daimler Import Co. show liabilities of $67,261 and assets of $4,626. The latter consist of a car, spare parts, accounts and a bond for $2,000. The liabilities consist of claims by Lawrence F. Braine and the New Netherlands Bank, H. A. Content and others.

McGUIRE JOINS FLANDERS

Detroit, Mich., Nov. 23—The Flanders Motor Co., has added W. F. McGuire, formerly of the Ford Motor Co., to its staff as production manager.

Decoration for Parade

Elaborate Floral Design for Motor Car Display Float Designed for Native Son

ONTARIO, CAL.—Editor Motor Age—What is the approximate horsepower of the 1910 National?

2—With a 3 to 1 gear and 37 by 4½-inch tires, what is its speed?

3—Would like some suggestions for decorating my National car for a parade. —R. C. Hammel.

1—The National 40 motor, 1910 model, developed from 43 to 87 horsepower at various speeds from 800 to 1,800 revolutions per minute, as shown in the horsepower curve, Fig. 2.

2—This depends, of course, entirely upon the type of body used and the weight in equipment and passengers carried. Seventy miles per hour is claimed as possible for these cars, with a 3 to 1 gear, 37-inch tires, and a normal load.

3—Motor Age has from time to time published illustrations of motor cars decorated for floral parades in the From the Four Winds column. Figs. 2 and 3 show a locomotive design that is original and which could very effectively be adapted to a large car. It would be built of wood strips, covered with canvas, and decorated with flowers. The cab would cover the tonneau, while the driver would occupy the fire-box. The front view illustrates the opening through which he looks. Passengers in the cab would be dressed in engineers' clothing, overalls and jumper, and would lean out of the windows. The steam dome, sand box, bell and stack may be made of cardboard, and the bell covered with gold paper. The latter may be a real bell, if available. The front wheels would be concealed by dummy cylinders, and dummy drive-wheels would occupy the running-boards. Behind the cab would be a tender, made on a large square framework, and running on a pair of small go-cart wheels. The front is supported by a light draw-bar, secured to the rear of the car on a pivot. The effectiveness of this design will depend, to a large extent, upon the care with which the details and proportions are carried out. A striking effect would be secured by covering the boiler and tender with ferns, picking out the working parts and accessories with colored flowers. The number on the side of the tender should be in white flowers, while the owner's name may be lettered in small white flowers under the window of the cab.

FLOATING AXLE FOR FORDS

Fontana, Kan.—Editor Motor Age—What are the names of cars under $1,500 with floating rear axles?

2—What are the names and addresses of cars with friction drive?

3—What is the speed of the American Scout?

4—How can one prevent grease from working out on the rear wheels of a Ford, and could a floating rear axle be put on a Ford?

5—What was the output of the Metz, American, and Detroiter for 1912?—Harry Gardner.

1—Detroiter, Cameron, De Tamble, Mitchell, Hupmobile, Courier.

2—Cartercar, Cartercar Co., Pontiac, Mich.; Lambert, Buckeye Mfg. Co., Anderson, Ind.; Petrel, Petrel Motor Car Co., Milwaukee, Wis.; Sears, Sears Auto Co., Chicago.

3—About 45 miles per hour.

4—Grease should not work out on the drums if a sufficiently stiff grease is used, and if not filled above the filler plug at the rear of the housing. The felt washer at the ends of the axle tubes may need replacement. To put a floating axle on a Ford would be like fitting diamond jewels in a low-priced watch. Such a watch was designed for steel bearings, and will keep good time so equipped. To install costly jewels in their place would be a useless extravagance.

The Ford rear axle gives good satisfaction as it is, since it has a light load, is itself light, and carries its load near the hubs. A floating axle would be prohibitively expensive, if properly adapted, due to the fact that floating axles are not made for cars of such light weight, and of course specially made axles would be very expensive. An axle heavier than the standard Ford axle would be less efficient than the standard type. The Ford axle as it is today is one of the lightest axles made, and as adapted to the Ford design in general, doubtless is the best for the purpose. A change in the axle design would necessitate a change in wheels, as Ford wheels could not be used with a floating axle. The peculiar spring suspension of the Ford would require that the axle be specially made for this use, the cost of which would be prohibitive. A new Ford axle may be purchased for $50, which makes a more elaborate axle unnecessary.

5—Five thousand Metz cars were built in 1912, according to the maker. The output of the Briggs-Detroiter Co. was 1,200 cars, according to that company.

CONCERNING THE CAMERON

Rice, Kan.—Editor Motor Age—I would like to know if the Cameron Car Co. of Beverly, Mass., is still making cars. If it is, what are the specifications of the 1913 cars?

2—How many cars did it make in 1910, 1911, and up to the present time in 1912?

3—How many cars did it sell in 1910, 1911, and up to the present time in 1912?

4—In what part of the country does it make the most sales?

5—Does it have more than one factory?

6—Is the Cameron car considered as successful as the Franklin in cooling?

7—Has the Cameron ever entered in any endurance races or contests in the last 2 years? If so, what was the result?

8—What is the ratio of the gears of the 1912 Cameron fours and sixes, low gear, intermediate and high?

9—What make of magneto is used on 1912 cars; also what carbureter?—A Reader.

1—The Cameron for 1913 will appear in four types of pleasure car chassis. The salient features are air cooling, leather faced cone clutch and Cameron rear axle gearset. Two of these models are rated at 24-horsepower and two at 36 horsepower. Each has four cylinders, three speeds with a variety of body styles.

2—500, 600 and 500, respectively.

3—500, 600 and 500, respectively.

4—West.

5—Yes, at Beverly, Mass., and Attica, O.

6—Motor Age has no record of any comparisons of the cooling of these two types.

The Readers

Suggestions for the Decoration of a National for Exhibition—Horsepower Chart of National Motor—Information on Air-Cooled Car—Regarding Suggested Change in Ford

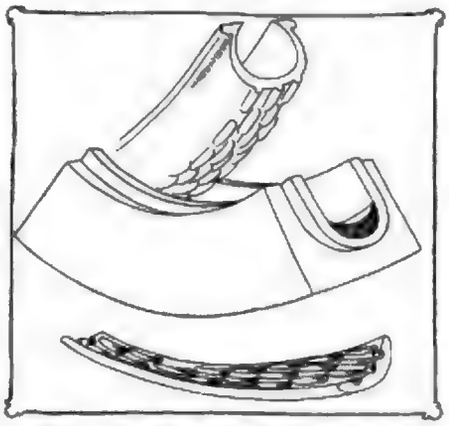


FIG. 1—HOW NON-SKID TREAD IS SECURED IN REPAIR

EDITOR'S NOTE—To the readers of the Clearing House columns: Motor Age insists on having bona fide signatures to all communications published in this department, not necessarily for publication but as an evidence of good faith. Motor Age will not publish communications where this rule is not lived up to.

Clearing House

Where the Old Cars and Their Masters Go—Causes of Motor Knocks Are Numerous—Carpenter on Spark Plugs—Effect of High Compression Explained—Vulcanizing Non-Skids

EDITOR'S NOTE—In this department Motor Age answers free of charge questions regarding motor problems and invites the discussion of pertinent subjects. Correspondence is solicited from subscribers and others. All communications must be properly signed, and should the writer not wish his name to appear he may adopt a nom de plume.

but both are considered well cooled.

7—In 1910 the Cameron won five first prizes. The Cameron also has won several races on the Brooklands track, England.

8—The gear ratios of model 28, the four-cylinder model 1912, are, 9½ to 1 on first speed, 4½ to 1 on second and 3½ to 1 on third, total reduction. On model 32, the six-cylinder, these are respectively 12 to 1, 5¼ to 1 and 3½ to 1.

9—The ignition system is optional.

POUNDS UNDER LOAD

Menard, Tex.—Editor Motor Age—I would like you to tell me what is the trouble with my car, Moline M 35, equipped with a Schebler model L carbureter and Splitdorf magneto. Running idle, the engine runs smoothly, but after the car is started and thrown into high gear, especially on a slight pull, when the throttle is opened, the engine will pound and knock, finally stopping if not thrown into first or second speed. On the first and second speeds there is no pounding. The car has been giving fine service up to a short time ago, when the trouble started. I first thought it was due to carbon, but the engine has been cleaned and is in good shape, or apparently so.—J. D. S.

There are two principal causes of pounding under load, when the engine runs well idle or in the lower reductions. One of these, and the most frequent, is improper handling of the spark. Drivers of long experience will often become careless and carry their spark too high in the mistaken idea that to do so will give a snappier action, or in search of economy of gasoline. Often too this is the result of carelessness, thoughtlessness or ignorance. Whether any of these fit your case you must determine by self analysis in driving. Try carrying your spark in the retarded position when taking a load, as in starting and climbing through the gears. If this does not avail, you are not to blame, as the car is out of proper adjustment.

Loose bearings would manifest themselves in this way. Whether or not these are the offending members may be determined by running the motor idle, alternately and in quick succession accellerating and retarding the motor with either the spark or throttle, preferably both. The bearings will click at each change in speed. If this does not prove to be the case, the trouble is not so deep-seated.

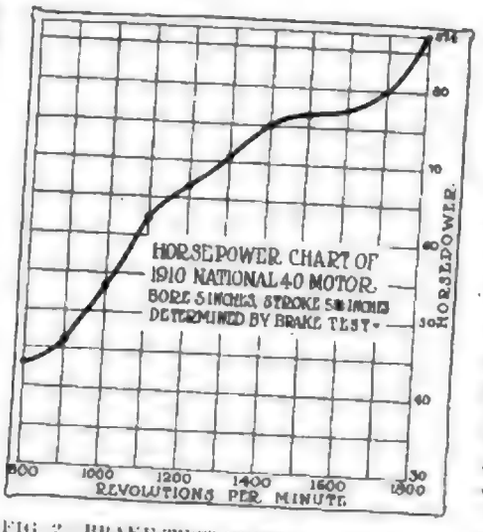


FIG. 2 BRAKE-TEST CURVE OF NATIONAL 40 MOTOR

Perhaps the most prolific cause of this difficulty second to mishandling of the spark is poor carbureter adjustment. Either an overrich or starved mixture will produce this effect. A mixture that is too rich will produce fair results at slight throttle openings, but when the throttle is opened wide and a severe load applied to the engine, it will choke up through lack of sufficient air to properly burn the excess of gasoline. A moderately starved mixture, on the other hand, will give very poor power, although with light loads the motor may appear to run properly. Which condition obtains may be determined by running the motor at medium speeds, first obstructing the air, and then forcing the air-valve open with a pencil. If the motor speeds up momentarily when the air is shut off, the mixture is too lean, and the carbureter should be adjusted accordingly. If it speeds up when the air-valve is opened, to the contrary, the mixture is too rich and should be thinned.

If the carbureter is found to be in perfect adjustment, or if after correctly adjusting it, the lack of power on high remains, the trouble must lie in the spark-timing. The advance must be too far, and the retard not far enough, so that it is impossible to sufficiently retard the spark.

Some Racing History

Whereabouts of Famous Racers and Drivers, and Operation of Warner Device

ATLANTA, GA.—Editor Motor Age—What has become of the big 90 horsepower Locomobile which won the 1908 Vanderbilt race?

2—What has become of the twelve-cylinder 180 horsepower Maxwell which turned up a mile on the Atlantic City beach in 1909 in :39 1-5? Is this record regarded as official?

3—How is the Warner timing apparatus arranged so as to compensate for the action of the rear wheels when a car hits the tape?

4—What has become of the Old Guard of motor car racers, such men as George Robertson, Herbert Lytle, Victor Hemery, Felice Nazzaro, Walter Christie, Billy Knipper, Jimmy Ryall, Joe Tracy, Joe Kilpatrick, Montague Roberts, Mortimer Roberts, Winters, Salzman, Frank Lescault, Ray Harroun, DeWitt, Harry Grant, Bert Dingley, Ray McNamara, Albert Denison, Charles Basle, etc., men who were considered the leading lights of the racing world?

5—Who is acknowledged to be the amateur champion of America at present? Has Bruce-Brown's amateur flying mile in :33 with the Hemery grand prize Benz in 1908 ever been bettered? If so, when, where and by whom?—J. N. Brightwell.

1—The Locomobile that won the 1908 Vanderbilt is on exhibition at the Chicago Locomobile branch, where it has been for several years.

2—Motor Age does not know. The mark in question is not in the record book of the A. A. A.

3—No compensation is provided. The device registers each time the tape is depressed. The first registration counts.

4—Robertson is president of a motor supply business in New York and has retired from racing. Lytle also has quit and when last heard from was connected with a car agency in Indianapolis. Hemery raced in the 1912 French grand prix. Nazzaro has quit and nothing has been heard of him this year. Christie had enough 2 years ago, while Knipper is the Stutz agent in Rochester, N. Y. Ryall has dropped out of motoring apparently. Tracy is a consulting engineer in New York. Montague Roberts is in the engineering department of an eastern car-making concern, but his brother, Mortimer, still races, he having won the Pabst trophy at Milwaukee. Kilpatrick is with Moross and Burman. Motor Age has no recollection of Winters. Salzman was with the Amplex until recently, but not racing. Lescault's whereabouts are unknown. Harroun retired after winning the 1911 Indianapolis race and is a motor car engineer. DeWitt is in Texas and Harry Grant at his Massachusetts home. Grant has been in one track race this year. Ding-

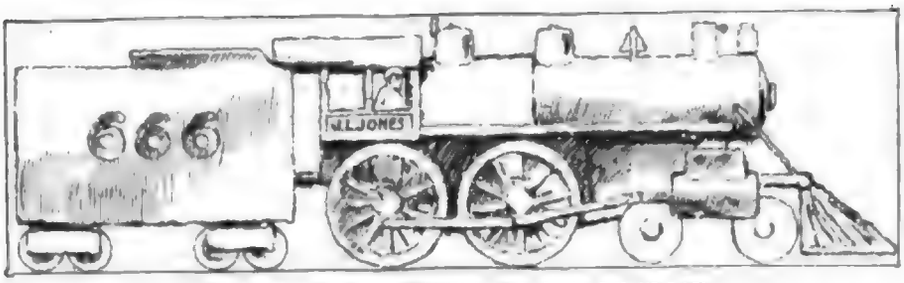


FIG. 3—ORIGINAL DESIGN FOR PARADE FLOAT

ley has retired and is the National agent in Los Angeles. McNamara never raced. He still is in the employ of the Premier company. Denison quit the racing game after his mate, Bourque, was killed at Indianapolis. Basle has not raced this year.

5—There is no American amateur champion. So far as known no amateur ever beat the mile in :33 made at Ormond by the late David Bruce-Brown. When the American Automobile Association ruled that amateurs could not compete against professionals, the bottom dropped out of the amateur end of the sport.

SPARK PLUG TROUBLES

Sauk Center, Minn.—Editor Motor Age—I have learned by experience that the spark plug as now constructed is most to be blamed for the poor operation of the motor. At least this is what I have found by taking notes and investigating the real cause of the ordinary miss-fire. As a matter of fact there are other causes which cause a miss, such as too rich mixture, too thin mixture, defective wiring, run down batteries, poor contacts, valves not closing properly, too weak valve-spring, out of order magneto, water in the gasoline, improperly adjusted carbureter, vibrator too tight or too loose, obstruction in the supply pipe, leaking intake connection, and short-circuited plug.

I recall one incident which will be useful to a good many motorists who will readily appreciate the explanation in my experimenting. A four-cylinder motor was in the habit of continually missing and one day I was at the owner's place on a visit when we got busy on motor topics, and he mentioned the trouble he was having and asked me if I could suggest a remedy.

I told him there were so many causes incident to a miss that I really could not suggest anything logical without seeing the motor. We went to the garage and he started the motor and the miss was much in evidence, causing the car to tremble violently and being most disagreeable with its noise. I went over the whole system of ignition and soon found that everything was O. K., with the exception of one plug, which was either broken or short-circuited in some way. I took the small blade of my knife and carefully scraped out the carbon deposit inside of the porcelain and then with a brush I washed the balance of the carbon out and was not surprised to see, on laying the plug on the cylinder head, a good fat spark between the positive and negative poles of the plug.

It seems the carbon had formed a sort of bridge across on the inside well up in the plug, and here was the reason the cylinder was dead. We replaced the plug and as soon as the motor was cranked away it went as if nothing had happened. What was surprising was that this same plug had done good work before, and here it now refused to do anything. The owner declared that the porcelain was cracked, but a careful examination proved that this was not the cause.

A new plug placed in this cylinder would give its spark instantly, which fact went to show the wiring was all right. After the test we scraped some carbon and placed it in the plug and thereby made a temporary short-circuit.

Electricity is sure to always take the shortest route home, and carbon is a fine conductor for it. It is a good plan, I find, to take the plugs out and give them a good cleaning every 500 miles, and the owner will be repaid by increased flexibility of his motor. This advice applies to all plugs, high or low cost, but as a matter of fact the properly constructed plug will give far better satisfaction than the poorly made one, although the latter may do good service for a time. Some plugs are made with the porcelain hole too small, thereby aiding in forming with carbon a short path for the electrical current, insuring its not coming to the plug points.

If your motor misses take a look inside the plugs and be sure they are clean and the points not too far apart. You, no doubt, have been troubled with more or less missing of cylinders, and if everything else is found O. K., look inside of each plug and your trouble will be found nine times out of ten.—A. D. Carpenter.

DE TAMBLE REAR AXLE MAKERS

Sauk City, Wis.—Editor Motor Age—Who made the rear axle in the De Tamble five-passenger machine, and where can I get parts for same? Also, is there a clutch on the market that can be put in place of the De Tamble clutch without much trouble or making many changes?—Theo. Decot.

The De Tamble Motors Co. purchased all of the rear axles used on its 1911 models from the Sheldon Axle Co., Wilkes-Barre, Pa. Motor Age has never heard of a clutch interchangeable with the De Tamble type, and it would probably involve considerable work to change the equipment in this particular.

Compression and Ignition

Reader Quotes Old Paper in Rebuttal of High-Pressure Theories Herein Advanced

GREENFIELD, TENN.—Editor Motor Age—In answer to my query published in your issue of October 10, you state that compression sufficient to ignite a charge would have to reach a degree of pressure in excess of 400 pounds to the square inch. Is this correct? In the report of tests made by Robert M. Strong and published by the United States Geological Survey, which appeared in Motor Age, October 28, 1909, the statement is made that a compression pressure of 70 pounds per square inch above atmospheric pressure, was found to be the maximum that could be used for gasoline mixtures without causing pre-ignition. If this is true would you not modify your answers to my second and third questions? Would it not also simplify greatly your answer to E. Rozier on the subject of high compression motors in the October 17 issue?—Harry C. Ward.

The report of Mr. Strong was made 3 years ago. Since that time the high-compression engine has come in for considerable development. The figure 70 pounds is extremely low, and must have been the result of carbon in the cylinders or faults in casting of the engine under test. Pre-ignition, in this case would not be the result of the heat of high compression, but would be the effect of the carbon or defective casting. In a perfectly clean cylinder, the experiments and practice with Diesel engines indicates that to satisfactorily explode a charge in a gasoline engine by compression alone, requires a compression of 500 pounds to the square inch.

On the other hand, it is no doubt true that a compression of 80 to 90 pounds in the ordinary engine would cause pre-ignition, because the engine is not designed for such pressures, the cylinder heads are not machined, and the interior surfaces and joints are not designed with sufficient care to prevent the formation of a carbon point. But the ordinary engine never reaches this point.

Your assumption that the compression in a motor is higher when pulling hard is not correct. The piston pressure upon explosion is higher, but the compression is in no wise changed, with the throttle open, by any increase of load. Therefore compression can have nothing to do with spark knocks in a normally smooth-running engine. The answer to E. Rozier in the October 17 issue is correct.

Engines expressly designed for the purpose can operate at compressions greatly in excess of that possible in those designed for moderate pressures. Were it not for the other considerations involved, as explained to Mr. Rozier in the reply referred to, it is probable that high pressure engines would become the rule rather than the exception.

Vulcanizing Safety Tread

How Special Treads Are Transferred to Newly Vulcanized Portion of Tires

KINMUNDY, Ill.—Editor Motor Age—Where would it be possible to secure molds to place inside a Miller cavity steam vulcanizer, for putting on Bailey treads, safety treads, etc., on repaired portions? When nothing is used the tire comes out of the vulcanizer smooth wherever it touches the mold. We have tried using plaster paris but this seems to hold the heat back and requires twice as long to cure a patch and the mold breaks when the tire is lifted out.—Kinmundy Garage.

The demand for a non-skid vulcanizer is comparatively new, and you undoubtedly have brought up a question that is very pertinent at the present time. The newer models of Miller vulcanizers are made with a detachable tread piece, which can be engraved with any form of non-skid tread desired. This process is expensive, however, and as it is assumed that your vulcanizer is not of the new type, it probably would not be available.

The more common method of accomplishing this is by laying a piece of raw rubber in the bottom of the vulcanizer and placing the tire to be repaired thereon, at a point where no repair is necessary, and the tread is in good condition, as in Fig. 1. This gives a duplicate impression of the tread. This rubber strip is made from regular tread stock or a special tread stock prepared with powdered asbestos by the Miller company. This strip is cured and laid aside. The portion to be repaired is then vulcanized in the usual manner, up to the last or tread cure, when the rubber tread pad, which previously has been prepared, is placed in the vulcanizer before application on the tire. It should be dusted with talc before applying to prevent sticking. The tire is then given the final cure, and the tread mould removed. The result is an exact duplication of the original tread. Such a tread would transmit the heat readily and may be used repeatedly.

STRAIGHTAWAY RECORDS

Coldwater, Mich.—What is the American record for steam and gasoline cars on straightaway and flying start. Please give name of car and driver.

2—The best time for the Ford model T, and Ford special for 1 and 2 miles.—G. F.

1—Frank Marriott in a Stanley holds the steam mile record, :28½, made at Ormond, Fla., January 25, 1906. Bob Burman in a Benz has the gasoline mile record, :25.4, made on the same beach in March, 1911.

2—The Ford has no official records for the distances mentioned.

GEARSET AND AXLE TYPES DEFINED

Clark, Mo.—Editor Motor Age—What does Motor Age think are the advantages of the extremely long-stroke motor, say 7-inch stroke with a bore of 4¼ inches? Would not the same motor develop as much power if the bore was the same and the stroke was only 6 inches, which is considered a long stroke?—Reader.

The advantages of long strokes have been discussed at considerable length in these columns in the issues of October 31 and November 14, 1912, and if the reader will refer to his back files he will get sufficient information to enable him to understand the subject in a general manner. As horsepower is measured to a certain degree by piston displacement, a motor with a 4¼-inch bore and a stroke of 7 inches would develop more power than a motor with the same bore, but with a stroke of but 6 inches. To be explicit, by the modified S. A. E. formula, published in Motor Age July 25, 1912, the horsepower of the 7-inch-stroke motor would be 46 if of four cylinders, while that of the 6-inch-stroke motor but 40, both ratings assuming a crankshaft speed of 1,400 revolutions per minute. This assumes that the valves, etc., are designed for this stroke.

LONG STROKE AGAIN

Omaha, Neb.—Editor Motor Age—Kindly explain the difference in selective, progressive and planetary transmissions.

2—What constitutes a floating semi-floating and three-quarter axle, and what are the advantages in either over the old style.—J. W. Kennedy.

1—The selective and progressive types of gearsets belong to the sliding-gear group, and differ in that the changing of gears in one case must be always in regular order, as indicated by the term progressive. This means that in the progressive type of sliding-gear transmission, to reach a given gear from neutral, all of the gears intermediate must first be passed through. In the selective type, however, from neutral any gear may be reached direct, or selectively, as the term indicates.

The planetary gearset consists of a gear pinion and an internally-toothed gear ring, between which, and meshing with the teeth of which, planetary, or revolving, gear-pinions are placed. These pinions are secured to a ring, which is fitted with a brake drum. Similar adjacent drums are connected to the internally-toothed gear ring, and to the driven shaft. The latter is not a portion of the gearset, but is the service brake. The other two brake drums are fitted with bands. When the band on the first drum is contracted, and locks it, the outer gear-ring is caused to revolve in the opposite direction from the inner gear pinion. When the second drum is locked, and the other released, the small planetary pinions travel around within the gearing, as turned, by the inner pinion, and is turned at a reduction of speed to that of the inner pinion. This gives low gear. High gear is obtained by clutching the driven shaft direct to the driving shaft so that the planetary gearset revolves about the shafts, as a flywheel, with the planetary pinions stationary.

2—This was explained in Motor Age in the issue of October 31, 1912.

HOW ELECTRIC HORNS WORK

Plattville, Wis.—Editor Motor Age—I would like to know the principle upon which the electric horns used on motor cars works.—Inquirer.

There are three principal types of horns, all of which operate on different principles. The first of these is of the siren variety, a rapidly revolving drum having apertures producing a sound, which is projected through an amplifying horn. The third type is mechanical in its action, consisting of a cam wheel, which is cut with teeth, and a button, secured to the center of a diaphragm, which bears on the cam. As the cam is revolved, it causes the diaphragm to vibrate, producing a sound which is projected through a horn. The cam wheel is turned by an electric motor. The fourth type is of the buzzer type, consisting of an arrangement of electromagnets, which vibrate an armature or pole-piece, which is in turn connected to a diaphragm. The vibration of the pole-piece of armature, causes the diaphragm to vibrate, producing a sound which is amplified by a horn.

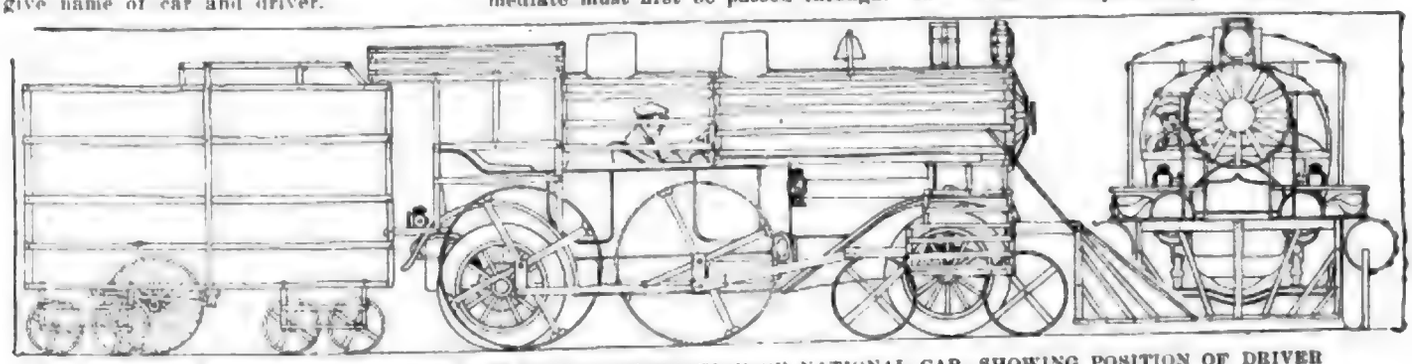


FIG. 4—DIAGRAM OF FRAMEWORK FOR FLORAL DECORATION OF NATIONAL CAR, SHOWING POSITION OF DRIVER

The Motor Car Repair Shop

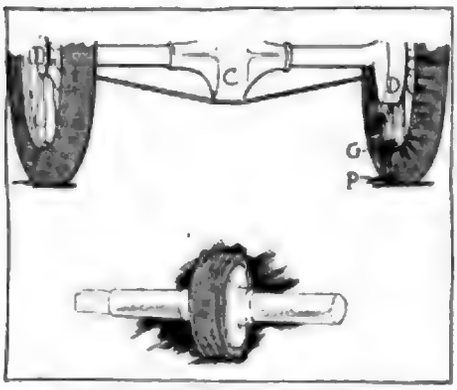


FIG. 1—CURING LEAKY AXLE

Handy Torch Support

PORTABLE gas torches suitable for brazing, etc., are to be found in many repair shops throughout the country; whilst there are many shops that need them but have them not. For the benefit of those who have or contemplate equipping themselves with these useful articles for the repair shop, the torch and stand shown in Fig. 2 are offered, with the belief that they will be found satisfactory.

Both the stand and the torch are of homemade construction and in constant use in one of the greatest motor car repairshops in the world. This equipment is particularly useful in performing repairs on motor car frames and the like. The stand possesses several unique features. It is of very light but substantial construction which makes it readily transportable about the shop; the top plate has three notches of various depths that serve to hold the torch at different angles; these notches together with the means to secure the clip to the stand facilitate the adjustment of the torch to almost any desired height or angle; and the clamp-pivot which grips the torch, can be readily lifted out of the top plate of the stand when it is desired to hold the torch in the hands.

The constructional details of this outfit are quite clearly shown in the illustration. The top plate and base ring of the stand are made of sheet iron ¼-inch thick, and an old motor valve-guide may be employed to support the pivot pin of the torch bracket whose features are more clearly shown in the mechanical sketches at the right in the illustration. The vertical supports of the stand, are made from ¼-inch iron gas-piping, each support being threaded at its ends and screwed into both the top plate and base ring at the same time. The torch bracket is a forging made in the blacksmith shop; it might be made from any suitable piece of flat iron, however, without the use of a blacksmith's forge. The torch is made from brass tubing and of ordinary blow-pipe construction.

Hints for the Amateur

This is an idea that may be seen in foreign workshops. Those who have tried it speak most highly of its efficiency. It is easily made and at the same time is inexpensive. Its utility, however, is in much greater proportion than its cost or the trouble of making it, say those who have tried it.

Testing Brakes for Winter Use

The time of the year has come when the motorist is considering the removal of the open body and replacing it with a closed one. One very important factor should be borne in mind, if an inclosed body is to be set on the chassis, and that is, brake adjustment.

Since the enclosed body weighs much more than the open one, it is evident that serious trouble will result should the brakes be neglected. Just before the car with the winter body is ready for actual use the brakes should be thoroughly tested. The car should be run at the rate of 25 miles an hour and the brakes suddenly jammed on. It should be noted whether or not the rear wheels slide, that is, if they grip the ground firmly, at the same time. One wheel should not slide before the other and both should hold the pavement at the same time the brake pedal is thrown.

Neglecting to readjust the brakes, especially in the case of cars with heavy limousine bodies, invariably causes rear-end collisions, the brakes not being able to resist the momentum of the now greater weight.

When Grease Leaks From Axle

In the upper section of Fig. 1, is shown rather a common cause of grease on floors, streets and tires. Oil has leaked out of the rear axle of a motor car and been thrown out of the brake drum D onto the spokes and tires of the wheels; and having been left standing for a while, a portion of that which was contained in the drum D has run down the spokes of the wheels and formed pools P around the tire's area of contact with the floor. This most undesirable condition is brought about in two ways; either the differential case C has been packed too full, or the felt washers placed at the end of the axles for the purpose of preventing leakage of oil therefrom have become worn down. The remedy in the first case is to remove some of the lubricant or perhaps use a heavier grade of oil, and in the second case to have new felt washers fitted in the axle ends.

In London, England, there was a time when the taxicabs and motor omnibuses of the city distributed so much oil about the streets in this way that a clause was included in the police regulations governing motor car traffic which required that every taxicab and other motor vehicle be fitted with means of preventing the leakage of oil from their mechanisms; and in the lower portion of Fig. 1 is shown the means employed by one of the great taxicab companies to eliminate the loss of oil from the rear axle, a remedy, by the way, which not only is a great benefit to all users of the streets, but which has saved the company many dollars worth of oil and tires. The means consists of a simple method of fitting several felt washers onto the driving shafts of the rear axle so that the oil from the differential case can not pass into the wheel hubs in such quantities as to leak therefrom. These felt washers are held between two brass flanged collars which are soldered or sweated onto the drive shafts as indicated.

Aside from the dirty and disagreeable appearance of the car, caused by the leakage of oil from a rear axle, and the extra labor required in washing the car, it is a well known fact that grease and oil have a most detrimental effect upon rubber such as is used on the treads of tires. It tends to soften this rubber and make it soggy, and when a car is run with a tire in this condition the rubber is not only easily worn off, but it also can be readily loosened from the fabric; then the cement used to secure the rubber to the fabric dries and crumples, and forms what is generally known as sand blisters.

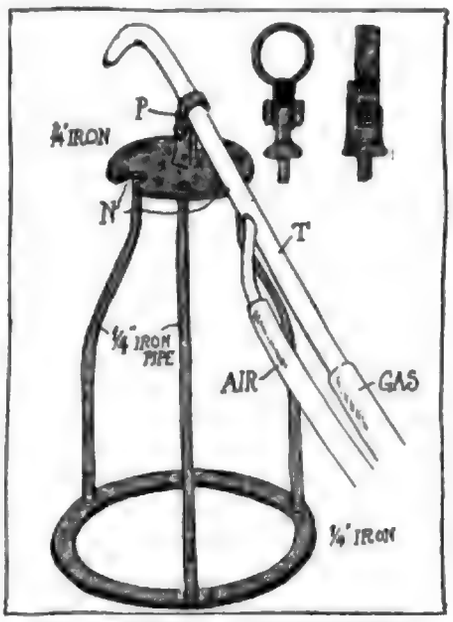
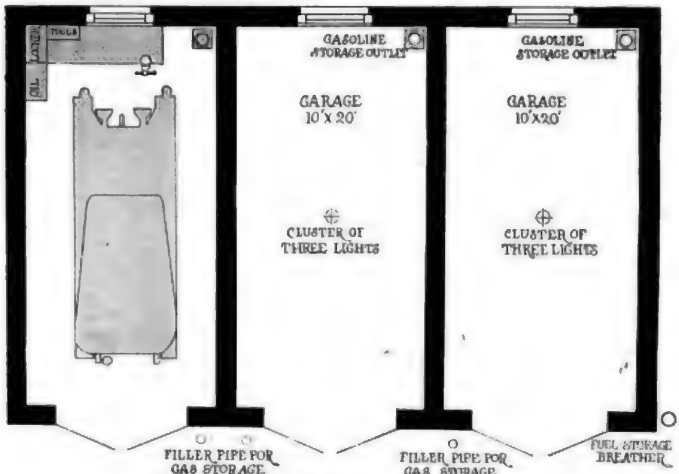


FIG. 2—SUPPORT FOR BLOW-TORCH

Housing the Motor Car

The Apartment House Garage



ARRANGEMENT OF APARTMENT HOUSE GARAGE

ONE of the drawbacks of city apartments from the viewpoint of the motorist flat-dweller in the city is the lack of accommodation for his car. The motorist is forced usually to patronize the public garage, which means inconvenience and expense. In order to cater to this class of tenant many owners of apartment buildings, particularly apartments of the better class, are erecting in connection with the flats, banks of small garages, one for each apartment.

A good example of this type of garage is that which recently has been erected in connection with two three-apartment buildings which have just been opened at Drexel boulevard and Fifteenth street, Chicago. At the rear of each apartment building is a bank of three one-car garages as shown in the illustration. The three form a single building about 32 by 12 feet in size, which is divided into three rooms by partitions. These rooms are only large enough for one car, being about 10 by 20 feet in size. The construction is fireproof throughout with the exception of the ceiling and the two partitions, which are hardwood. The walls are of red pressed brick with a flat roof. The floor is cement and in the floor of each stall is a drain connecting with the sewers. A single window high up in the rear wall and the windows which form the upper third of the double folding doors afford sufficient illumination for daytime while a cluster of electric lamps in the ceiling give light at night. There is room at the end for a work bench and tool chests, as well as an oil cabinet, although these are not supplied with the garage.

Under the floor of each room is an underground gasoline storage tank, the outlet of which projects through the cement floor. Just outside of each room in the cement court the filler pipe protrudes. This is provided with a lock and each tenant thus has his own fuel supply. At one corner of the building rises the header, which acts as a breather to admit air to all of the fuel tanks as the gasoline is drawn off.

Quite a novel arrangement is employed in providing a driveway and entrance to the garage buildings. The two apartment buildings to which these two sets of garages are adjuncts are side by side with a space of about 10 feet between them. A cement drive from the street to the cement court in the rear is laid between the two flat buildings, with carriage entrances facing each other on the driveway. Between the two entrances there is an art glass canopy over the drive and connecting the entrances. This provides protection from the weather to tenants entering or leaving the motor cars.

Arrangements of this sort for motorists attract the better class of tenants and

SIX SINGLE-CAR GARAGES IN BANKS OF THREE FOR APARTMENT HOUSE

increase the value of the property very materially at a slight increase of cost. These two banks of garages accommodating three cars each represented an expenditure of only $1,800 each, including the lighting arrangements and the underground storage systems. Single garages of similar construction and equipment for one car probably could be put up for about $1,000 or less.

Manufacturers' Communications

PROPER CARE OF UNUSED BATTERIES

CLEVELAND, O.—Editor Motor Age—Many owners whose cars are equipped with storage batteries in connection with lighting, starting and ignition systems and who do not care to operate them during the cold months, will soon be storing them for the winter.

True, most owners operate their cars all the year around, but some, especially if they have open cars, store them. It is for the benefit of the latter class that this article has been prepared. It is believed a perusal of it would be of benefit to many.

Unless a storage battery is given proper preparation for its long period of inactivity, the owner, when he puts his car into service again in the spring, will find cause to regret his neglect. A storage battery is at its best when in constant service and no amount of intelligent use will cause it to deteriorate so rapidly as idleness unless prepared for it. A few words, therefore, upon the care of this very important but much abused accessory may save the reader the price of a new battery next spring.

Considering, first, cars equipped with starting and lighting devices operated from storage batteries. In order to maintain a storage battery at its proper efficiency it is necessary to give it a charge at certain intervals, therefore the owner should so arrange that he can run his engine and charge his storage battery at least once every 2 weeks. It is unnecessary to run the engine for a long period of time, only just sufficient to bring the battery up to its full capacity.

Every car owner should provide himself with a specific gravity hydrometer, a device made of glass with a rubber bulb, which enables one to draw solution up from the cells to ascertain its strength or specific gravity. At intervals of 2 weeks the engine should be run until the gravity of the solution is up to 1.280 degrees as indicated by the hydrometer reading. If this is done regularly every 2 weeks, it will be necessary to run the engine only about an hour each time. If the owner does not possess a specific gravity hydrometer, the engine should be run 2 to 3 hours every 2 weeks for the sake of safety. However, it will be found much more economical and easier, as well as safer, to be guided by the accuracy of the hydrometer than to guess at the time necessary to operate the engine.

To charge the battery properly, the engine should be run at a speed equalling a car speed of 20 miles per hour. The method above suggested for cars equipped with generator or dynamo will be found all that is required and if carefully observed the owner may be sure that his battery will show no loss of efficiency when it is again put into regular service.

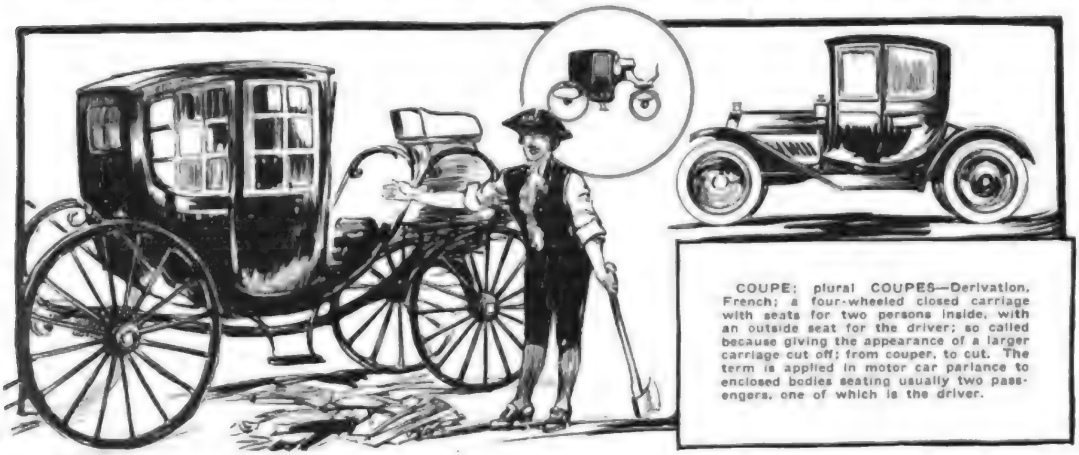
In some instances the owner may be obliged to store his car where it is impossible or very inconvenient to operate his engine as above directed. When this is the case, it is recommended, if electric current is available, that the owner purchase what is termed a rectifier or small charging machine. Rectifiers of this description are produced by several manufacturers and may be procured through supply dealers at a reasonable cost. They are small devices to be attached to the wall and plugged into an ordinary electric light socket. A charge over night or for about 12 hours every 2 weeks with this apparatus will be sufficient to keep the battery in healthy condition.

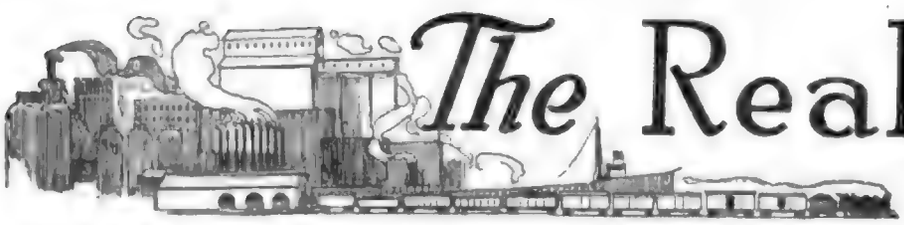
When about to charge the battery, in every case it should first be inspected to see if it is filled with solution. If the solution needs replenishing, distilled water should be added until solution fully covers the plates, which may be determined by removing the vent plugs and looking down into the cells.

It is strongly recommended that the battery be charged on the car by its own dynamo and engine when at all possible. If, however, this is impossible and the owner does not care to incur the expense of purchasing a rectifier, there is left only one suggestion for the care of the storage battery. In this case, remove the battery from the car and arrange for its storage at a garage which has charging facilities, stipulating that it must be charged every 2 weeks. The cost of having it so cared for will be nominal and will prove insurance against serious deterioration.

Storage batteries should always be stored in a dry place, preferably where the temperature does not fall below 40 degrees F.—Willard Storage Battery Co.

Antecedents of Words Now Part of Motor Phraseology





The Realm of the Miners Recognize the Motor Truck

Mule, Horse and Burro Rapidly Giving Way to Power Vehicles in Far West—Great Progress Made in Last 3 Years—Road Repairs Figure in Upkeep Cost

By William B. Stout

THE motor truck is fast supplanting animal hauling for mining work in the west. Metal mining has been for years a business in which transportation has become increasingly more serious. Two-thirds of the great metal mines of the far west are many miles away from the railroads and are too frequently located in such rough country that to put it in the words of a mining man "the sure-footed burro needs tire chains to keep from skidding."

The mule, horse and burro are giving way to the motor; gasoline is taking the place of feed, and with the adoption of the motored wagons good roads are being built and developed as a matter of business.

A curious phase of truck figuring is seen in that the mining men figure road repairs as part of the upkeep cost of the vehicle.

While 3 years ago there scarcely was a motor truck in Arizona, now all the principal mining companies are using them and a contractor would not think of taking up a mining job without at least figuring on their use. Animal-hauled vehicles are fast becoming a curiosity in the big camps and the ore wagon is being relegated to the limbo of forgotten things.

Monarch Company Satisfied

The Monarch Mining and Smelting Co., Wickenburg, Ariz., is using a 3½-ton White motor truck for ore and supplies, hauling over a 22-mile trip doing the work of two four-horse teams over very bad roads. The truck is a big success financially and more are to be put into service soon.

The Calumet and Copper Creek Mining Co., of Los Angeles, is using a 5-ton White motor truck for ore hauling with excellent results and at a great saving.

The Arizona Southwest Copper Co. of Yucca, Arizona, is using a 6½-ton Saurer truck to haul its concentrates from Copperville to the Santa Fe railway, a distance of 27 miles.

The Pioneer Smelting Co. of Corwin, Ariz., is using a 6½-ton Saurer on a 15-mile haul making an average of six trips a day.

Other firms using motor trucks with success for hauling from mining points are the: Cineguita Copper Co. of New York; Lattimer Mining Co., Hazelton, Pa.; Jersey Valley Mines Co., Worcester, Mass.; Gilsonite Co., Denver, Colo.; Engels Copper Co., San Francisco, Cal. All of these latter firms use Saurer trucks.

Some Roads Are Bad

The Monarch Mining and Smelting Co. is located in a sandy section of the country. The roads, in the process of improvement, are very bad. For a considerable portion of the distance of 10½ miles made in the trip to the mine there are sand washes in which the sand is very deep, hills are of exceedingly sharp pitch and roads very narrow, necessitating slow running to round the curves. In coming from the railway to the camp the machine must climb over 1,200 feet. As there are several adverse grades on the way the actual climbing is more than this.

In spite of these conditions the truck is hauling 7,500 pounds to the load, though averaging about 5,000. With the completion of the road which the firm is now building 7,000 pounds per load can be averaged. On account of the road conditions speed is low on this route 3 hours generally being taken for a trip in. Hence at present but one trip a day is made. As soon as the new road is completed two trips a day will be made.

The truck is making about 7 miles per gallon of fuel, gasoline costing at this point about 27 cents a gallon.

A four-horse team takes 2 days for the round trip between the camp and the railway, with a maximum load of about 4,000 pounds. When the new road is in the motor truck will do the work of about four four-horse outfits which cost $8 a day. Truck cost is about $10 per day so that under the new conditions the truck will save about $22 per day to the firm. Motor truck drivers are paid $3 per day. The new arrangement will allow of hauling at a cost of about $5 per load of 3½ tons instead of $16 for a 2-ton load.

Besides the money gain there are many other advantages which will readily occur to any mine owner such as speed, frequency of communication if one is relying solely on the truck as a means of communication, less upkeep of outfit, and various other points against which must be set the high initial cost of the truck. The steel wheels used on the truck have been a great advantage for this climate.

The Arizona Southwest Copper Co. of Yucca, Ariz., uses a 6½-ton Saurer on a 27-mile haul. During the first 2 months of motor truck use the firm used the machine to haul heavy mill machinery and supplies to the mine, thus reducing the cost from $15 per ton to less than $5.

The same firm tried several makes of trucks with smaller motors and found them not powerful enough or reliable enough for the heavy hauling of this route. The present truck has run on regular schedule without hitch. The first 13 miles of the run is a continuous upgrade of from 2 to 4 per cent over desert roads with a number of deep sand washes. The truck makes no work whatever of crossing this sand when fully loaded, the low gear being seldom used.

The next 7 miles is a steep climb up the Wallapai mountains and it takes the truck 2½ hours to make the distance. The grades on this section are from 10 to 15 per cent. The load gear is used exclusively for this distance. The truck makes this climb without a sign of overheating.

Tires Stand Up Well

The last 5 miles is a downhill grade of from 6 to 8 per cent to the mines. The road surface is fairly good and the Goodrich tires with which the car is equipped show very little wear after 3,000 miles of service. They should last to at least 8,000 miles, it is declared.

When the company's mill is in operation the hauling conditions will be reversed, as the truck will have only 5 miles uphill with load and practically 22 miles downhill to the railroad.

In hauling lumber and supplies to the mine the round trip of 54 miles was made in one day but as the loading and unloading of the heavy machinery had to be done by hand the average time during the first month was 1½ days for the round trip. Previously the company paid $15

Commercial Car

Arizona Concerns Using Many Trucks

Examples When Motor Vehicles Save Money in the Handling of Ores—Adoption of New Method of Transportation Has Called Attention to Need of Better Roads

per ton on this haul and it took 4 days to make the round trip with horses.

The following cost figures have been taken as average, for the first month's operation:

Gasoline, 19 gallons at 30c	$ 5.70
Oil, 5 quarts at 20c	1.00
Grease, 1 pound at 12c	.12
Driver, 1½ days at $4 per day	6.00
Total visible expense	$12.82
Upkeep expense is given at the following figures:	
Interest on investment at 6 per cent and insurance for 1½ days	$2.11
Depreciation at 10 per cent	2.67
Repairs	2.25
Tires	2.83
	$9.86
Total cost per round trip, hauling 5 tons one way	$22.86
Cost per ton	4.53
Former cost with teams by contract	15.00
Saving per ton	10.46
Saving per load	52.30
Saving in 3 months, about	4,000.00

Cost Will Be Reduced

The manager of the concern figures that with the completion of the mill and hauling ore to the railroad as well as hauling supplies back to the mill he will reduce his cost per ton to less that $4. Five Saurer trucks will be used to take care of the work.

Other Arizona mining companies are using motor trucks with success as against mule and horse hauling including the Copper Queen, Calumet and Arizona, Copper Creek, Arizona Southwestern Copper, Pioneer Smelting, United Verde, Inspiration, Gold Road, Miami and others.

In Globe, Bisbee, Clifton, Jerome, Kingman and other camps of this western state the motor truck, once looked at with scorn is respected for what it is doing.

In the earlier attempts motor trucks failed to meet the requirements of this country and work, but modern machines are proving a complete success. Nearly all the trucks in use at these mines have dumping bodies. There is little demand for any other kind of truck, for nine-tenths of the freight handled is ore, coal and coke. In a few isolated instances trucks are used with ordinary bodies for transporting provisions and merchandise, but as a rule the purchaser prefers to buy a machine that he can use for freighting ore if possible. Trucks are generally of 5-ton capacity and large engines are in preference. The Saurer is a favorite in this territory, with Packards, Macks and Alcos close behind.

The Pioneer Smelting Co., near Tucson, uses motors to transport ore from the Plumed Knight mine to the smelter. The distance is 7½ miles and each truck makes six round trips a day with a load of at least 6 tons. The cost is 75 cents per ton. With mules and wagons the cost was from $1.50 to $2 a ton. At this rate each truck is saving the firm about $13,500 per year.

Two drivers are used on a truck, each making three trips a day to the smelter. Between the smelter and the mine is a steep up-grade of 8 to 12 per cent.

Condition of Highways

The roads are fair except the first 2 miles from the smelter which section is very sandy and, during the long, dry season, cuts up very badly. The truck is set to run at 10 miles per hour and, with the exception of the steepest hills, averages that for the trip both ways. The machine has been in use for 9 months and has covered some 17,000 miles, delivering 36 to 40 tons of ore a day to the smelter, besides the hauling of all supplies from the smelter to the mine. It would require from thirty-six to forty animals to do the same work in the same time. The cost figures on the truck are based on repairs and renewals, interest on investment, operating costs and also on road repairs.

The first 3 months operation showed a cost of 72 cents per ton but road repairs and renewals on trucks have been higher since then bringing up the cost per ton.

The first set of tires—Goodrich wireless—ran 11,500 miles front and 9,700 rear although the firm does not consider it economy to run them as long as this.

Views of Superintendent

"Wherever the road conditions are even fair," says the superintendent of this concern, "the truck will show a substantial saving over the horse, and the relative efficiency of the truck over the horse will increase in direct proportion to the improved condition of the roads.

"One of the requirements of a truck for work in this climate is some form of metal wheels, as wooden wheels will not stand up in desert work."

While the motor truck is making good in mining work it is at the same time proving itself a benefit to whole sections of country through the good roads influence radiating from every point where the new vehicles are in use. As roads improve so will motor transportation increase. Whereas the pleasure car demands good roads from a comfort standpoint and for speed, the motor truck coming onto country roads demands good surfaces as a matter of dollars and cents, which only means that in those sections where distance hauling is common as is found in the mining states, there good roads will have the first chance to develop.

The successful use of trucks for mining work will no doubt lead to its similar adoption in other lines.

ILLUSTRATING GRADES ENCOUNTERED ON TRIP FOR PIONEER SMELTING CO.

Congestions at the Freight Stations

More About Motor Trucking Problems That Are Found in Chicago

NEARLY all of the freight stations of Chicago have about the same problems to meet, though in differing degrees. The chief loss at all stations is due to the influence of horse pace and the resultant laziness of drivers.

Following last week's story data has been obtained from other Chicago freight stations which bears out and emphasizes the points pointed out in the former article as needing attention.

Grand Trunk and Wabash

The traffic of the Grand Trunk and Wabash freight yards is controlled by much the same hindrances that were mentioned in connection with the Lake Shore station. The railroads mentioned handle all the in freight at two opposite platforms situated on a 45-foot street. Down the center of this street a storage-battery street car operates, adding to team congestion.

The buildings are constructed with 10-foot doors, 15 to 20 feet apart with blind walls between. The Grand Trunk building is about 25 years old while the Wabash is comparatively new, though traffic conditions are much the same at both platforms, and loading takes about as much time at one place as the other. The street is in very poor condition. Not more than five motor trucks come to this street in a day, for either railroad.

Wagons that cannot get to a door back up against a blank wall. When the door is cleared they must then switch back and forth for from 2 to 5 minutes before they can maneuver to position for loading. Much is done unnecessarily, especially on the Grand Trunk side, for the railroad is willing inside the warehouse to truck the goods the length of the platform to accommodate teamsters in a hurry.

When the platforms are full on both sides there is just room for the electric car to pass between. It usually takes the car from 7 to 10 minutes to run two blocks through this district.

Most of the business at the Grand Trunk platform is handled in the forenoon. At this time the whole complement of men is put on the loading force. The business through the tunnel is about one-third of the street business. The tunnel cars are handled in slack moments of horse service. The foreman of the platform claims that the chief delays are from the wagon end, firms often sending but one man to load an 8,000-pound load. At the present time the narrow doors hinder and there could be much better service if the whole platform were thrown open. The inside gang is always ahead of the outside men, according to the foreman.

A large amount of the work is transfer freight which is handled by the Arthur Dixon Transfer Co. These loads are mixed and require a great deal of hand trucking for each load. In spite of this the truckers give the wagons their loads at the platforms faster than the drivers can load on. Much time is lost in backing in and in tying on the load also. One driver timed took 10 minutes after the load was on in roping. Another delay was noted where a driver, after backing up to a door for which others were waiting, stood and talked to a loiterer for 15 minutes without handing in his bill of lading or making any attempt to get his goods.

The approach to the platforms runs under a street viaduct. A great deal of delay in getting in is caused by the obstruction of teams under the viaduct, the drivers sleeping or drinking, it is said. This is worst from 11 to 1, each day. The chief delay of all, according to the foreman, is due to the soldiering habits of the teamsters. What few motor trucks come to these yards are served quicker than the average wagon on account of the greater alertness of the drivers.

In the afternoon when the street traffic is light, the tunnel cars are loaded and the piles of goods arranged. Boss unloaders direct the stacking and sorting of the goods off the cars to the best advantage of the truckers who load. In arriving at the platform the driver merely hands his bill of lading to the nearest trucker inside, who hands it to the boss trucker. This man will assign one or two truckers, depending on the size of the load. He signs but once for each bill of goods.

Wabash Freight System

In the Wabash freight system, separate men unload the cars. The truckers have nothing to do with it. The unloaders stack the goods on the floor at the handiest place near where they unload it. Wagons are loaded in the morning and tunnel cars in the afternoon. About one third of the freight goes through the tunnels.

Long delays are caused by the trouble in finding things on the floor, as the unloaders have no special system of stacking in order. Clerical delays are also noticeable as every trucker is his own clerk. There is but one trucker assigned to a wagon. He has to find the goods, truck it to the wagon, wait until it is loaded and then accompany the driver to the office, where the driver signs all of the load. Several signatures have to be affixed to each bill of goods.

The fact that unloaders, having nothing to do with loaders, make it difficult to locate a load. Afternoons are spent in loading tunnel cars and in resorting freight left on the platforms. The foreman mentioned delays through the laziness of the drivers in the street but said that, being a public street, there was no way to make them move on or hurry. The foreman gets all his orders from the office and does not contemplate any change in system.

Service at Freight Yards

A 3-ton truck belonging to the Dixon Teaming Co. arrived at the in platform of the Illinois Central on November 11 at 7 a. m. and did not leave with its load until 11:30, a wait of 4 hours and 30 minutes for a 4-ton load. Another Dixon team which had arrived at 11 a. m. did not leave until 4:03 p. m., a wait of 5 hours and 3 minutes.

When proper loading facilities are furnished motor trucks will be put in service for all of the freight hauling, saving thousands of dollars a year.

FOUR-WHEEL DRIVE TRUCK WITH STAKED BODY

Four-Wheel Drive as Applied to Trucks

Description of Motor Vehicles Made by Clintonville, Wis. Concern

NOW that the gasoline motor has been developed to a state where manufacturers content themselves with minor refinements in its further development, the removal of its most serious handicap,—inefficiency in the application of its power, has been undertaken in earnest, and is receiving more attention from practical engineers. It has been learned that large wheels and broad tires increase tractive efficiency because of the increase of traction area. But there are limits which restrict the size of wheels, especially so in motor truck design, where the height of the floor of the body is directly affected by the size of the wheels.

Four-wheel drive therefore is considered by some of the engineers as a logical development in design. This has been recognized in railway traction for several decades, but the application of this principle to road traction presented grave difficulties, among which the most serious were the allowance for the steering of the wheels and the friction resulting from the necessarily great length of the transmission line.

Judging from the results that have been obtained in the development of this idea, as embodied in the product of the Four Wheel Drive Auto Co., Clintonville, Wis., these objections were either not so serious as first imagined, or they have been well overcome by the manufacturers of trucks of this type; as shown in the recent government army trials, in which these trucks made an excellent showing.

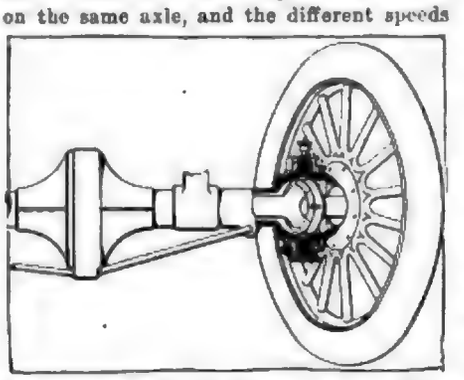
Four-Wheel Drive Advantages

The principal advantages accruing to four-wheel drive are doubled traction area, more positive drive in turning, ability to control skidding, due to the front wheel traction, and better distribution of load on tires, and consequent saving in tire-wear.

Four-wheel drive trucks are made in two capacities for 1913, 1½ ton and 3 ton, respectively. The former is supplied with a 29-horsepower, and the latter with a 36-horsepower engine. They are almost identical, except as to size, and a differential lock, which is fitted to the larger model, but which is missing in the smaller one. The general chassis specifications, which apply to both sizes are as follows: The motors are of four cylinders, fitted with ball governors. These motors are water-cooled, and equipped with Stromberg carbureters, Bosch high-tension dual ignition, and force-feed lubrication. The Hele-Shaw multiple-disk clutch is used, and drives to a gearset of special design. This gearset is of the individual, solid-jaw clutch pattern, with the gears constantly in mesh, and provides three forward speeds and a reverse, on the selective principle. Drive from the gearset is by silent chains to a differential, suspended amidships.

Driving Mechanism

Shafts drive from the center differential to each axle, where the transmission is by the usual bevel gear drive and differential. It is thus seen that three differentials are used. This is necessary to allow for the different speeds of wheels on the same axle, and the different speeds of the axles. On the large car, a differential lock is supplied to lock the center differential, so as to drive on one axle only, should the necessity arise. A large brake is fitted to the end of the transmission shaft, which acts on all four wheels, through the differentials. Control and steer is standard, and from the right hand.



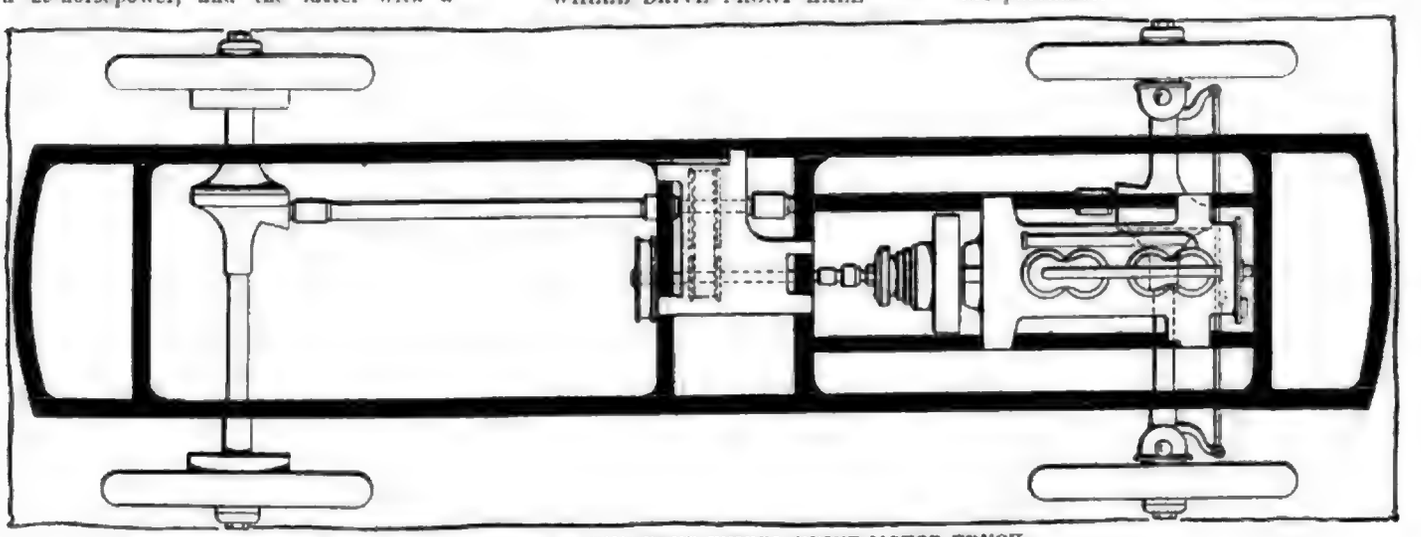
STEERING AND DRIVING JOINT ON FOUR-WHEEL DRIVE FRONT AXLE

The manner in which the same axle is made to allow motion of the wheels in steering, and to transmit drive as well, is interesting. The front axle is substantially a floating shaft-driven axle, the ends of which are in the form of ball-shaped steering knuckles. These are of course hollow, and contain universal joints, by which the drive is transmitted to the wheels from the floating axle-shafts. The rear axle is of the ordinary floating type. V-shaped tubular torque members secured at their inner ends to spring hangers at the middle or primary differential, are used in propulsion, and to maintain the alignment of the axles.

The motor is suspended on a subframe, beneath the seats, while the radiator is carried in front on flexible mountings. This form of construction, popularly called the American type, leaves a large amount of loading space forward of the rear axle, while the weight of the motor and driver are carried mainly by the front wheels. This is of course essential to bring, as nearly as possible, equal loads on all wheels.

Facts About Small Model

The small car has a wheelbase of 124 inches, and a loading space 11 feet 4 inches in length, while the larger model has a wheelbase of but 120 inches, with a loading space the same size as its smaller brother. Tires are 36 by 4 inches in size all around; 20 gallons of gasoline are carried, and the chassis are sold with lamps, tool kit, and horn. Bodies are specially built to suit the requirements of the purchaser.



CHASSIS VIEW OF THE FOUR-WHEEL DRIVE MOTOR TRUCK

From the

URUGUAY Show Postponed—Due to unavoidable delays, it has been necessary for the government to postpone the international competition of agricultural motor vehicles at Montevideo, Uruguay, until March 31, 1913.

Iowa Road Men to Meet—The Iowa Good Roads Association will hold its annual meeting in Des Moines some time in December. The good roads boosters are going to make a fight for state aid. F. J. Tisbenbanner, of Gilmore, is fathering a plan for good roads which will be presented to the meeting for support. He would have the state motor tax, which now yields $500,000, spent to buy crushed rock, which is to be shipped free to the different counties of the state.

Oregon Takes Backward Step—The citizens of Oregon have turned down the state highway appropriation for good roads. In fact, they turned down every amendment that called for the expenditure of money. So far as the state is concerned, there will be no good roads work done until after another election. The people did, however, vote to allow counties to issue bonds for road work, but this is not of importance, for before their bonds can be issued they will have to be voted upon by the county citizens, and by the recent election it can easily be seen that there will be no chance of carrying the point that way.

Booming Roads in Illinois—The Illinois Highway Improvement Association has decided to hold weekly meetings in the principal cities of the state in order that the officers can become acquainted with the good roads boosters in each district and secure uniformity of action in the movement for state highways. The first of these meetings will be held in Bloomington and each city will be visited in turn. The association will probably also support a bill which abolishes the present system of township road commissioners and places in the hands of the state general supervision of the construction and maintenance of the public highways. Chairman Homer J. Tice of the legislative commission is now giving the finishing touches to the bill.

Another Traffic Evil Develops—When Philadelphia regulations were put into effect some time ago requiring all motor cars to be parked in the center of Broad street instead of being left standing along the curb line, it was thought that the daily congestion of that busy thoroughfare would be considerably relieved and go a long way toward facilitating the handling of traffic, but since the order has been in effect a new evil has cropped out that makes the problem as difficult of solution as before. It appears that some motor car users have taken advantage of the fact that there was no limit to the time a car could be left standing, and as a consequence many cases have been noted where cars were parked from morning until night, defeating the very purpose of the order. That Broad street cannot be used as a public garage is the ultimatum of the department of public safety, and the experiment will be tried of limiting the parking of cars to 1 hour at a stretch.

Milwaukee Sets Dates—The Milwaukee Automobile Dealers' Association has selected the period from January 11 to 18, 1913, as Milwaukee show week, during which the fifth annual motor show will be held in the Auditorium.

Winnipeg Working Hard—After several years of hard work on the part of the Manitoba Good Roads Association some good results are becoming apparent. A by-law has been passed by the municipality of Kildonan which provides for the construction of 5 miles of concrete highway from the northern limits of the city of Winnipeg to the limit of the Kildonan municipality on the highway to Selkirk. There is every possibility that the work will be continued from this point by the adjoining municipalities, and if this is done it will provide the first link in a main highway between the city of Winnipeg and Winnipeg Beach, the pleasure resort on Lake Winnipeg.

New Plan Works Well—Little hardship has resulted from the recent city ordinance which forbids the parking of a car along the curb in the business district in New Orleans, as any number of garages have sprung up in the vicinity of the office buildings and department stores where the cars may be left conveniently. In fact, since the plan has been tried owners are not objecting. Cars now are protected from the elements and there is no danger of their being damaged by some careless driver in the street. The new ordinance allows a car to stand at the curb so long as a person capable of handling the car remains in it.

Convict Labor Retained—Permission has been granted for the continuation of the policy of using convicts on road work in Louisiana. All convicts that can be spared from the penal farms will be used on the road during 1913, as they have been this year. It is hoped to improve at least 100 miles of highway with the convict gangs alone.

Cincinnati Club Hustling—The Cincinnati Automobile Club will change its headquarters when the new Gibson Hotel is completed. The club is now temporarily located on Fourth avenue. There will be about one-half dozen gayly decorated rooms. The club will be located on the fourth floor. A new country club may be added to the general utility for the motorists. If present plans are adopted the country home will be located out about 6 or 7 miles from the city. Lawn tennis courts and golf links may be built. The cost has been estimated at $20,000 or $30,000.

Ohio Counts Chauffeurs—There has been an increase of 2,750 in the number of licensed chauffeurs in Ohio within the past 2 years. In 1910 there was a total of 5,135. Last year the number was 6,402, which was at that time equal to any other state in the union. But this year—with 30 days more before the records are closed—the number aggregates 7,885 and netted the state the sum of $15,770. The fiscal

Old Roads Made New—No. 5—In South Carolina

HERE is an example of contrasts as furnished by photographic evidence in the hands of Logan Walter Page of the department of public roads at Washington. Both scenes show the same stretch of roads near Cheraw, S. C. The first one shows the road before any improvements were made. The second shows the same highway after it was rebuilt and after it had seen 24 months' service

Four Winds

year ends on December 15, and it is expected that before that time the total number of licensed chauffeurs will exceed 7,900.

Tennessee Would Tax—A $3 tax on each of the 8,700 cars in Tennessee is proposed by C. C. Gilbert, the secretary of the Nashville Automobile Club. The money raised in this way is to be devoted to road improvement. By applying this fund annually to that which will be contributed by the state and county authorities, road improvement can be hastened greatly, he says.

Texans After New Road—At a meeting of representatives of nearly every county between San Antonio and Houston, Texas, through which the proposed highway between those cities is to run, held at Victoria on November 20, there was organized the Alamo-Victoria-San Jacinto Highway Association. The purpose of this organization is to carry out the plans for the construction of the proposed road. J. P. Pool, county judge of Victoria county, was elected president of the association, and D. E. Colp, of San Antonio, secretary.

Iowans Choose Officers—The executive committee of the Iowa Automobile Association held a meeting in Des Moines last week and elected the following officers: President, G. D. French, Davenport; vice-president, L. J. Dickenson, Algona; second vice-president, C. N. Wyckoff, Sioux City; secretary-treasurer, H. Leslie Smith, Des Moines. W. E. Moyer, retiring president, was made chairman of a legislative committee which will work in the coming session of the Iowa legislature for macadamized roads in the state.

Saved by Self-Starter—A citizen of Nashville, Tenn., who is the possessor of a new six-cylinder Hudson, was nearing the N. and C. Railroad crossing on the Harding road when the headlight of an approaching motor car blinded him so that instead of following the road, which makes a turn as it crosses the railroad track, he drove straight on up the track itself for about 30 feet before he could stop his car. Putting on his brakes too quickly, he checked his motor just as an approaching train whistled for the crossing. It seemed as if there was no chance to escape a bad accident, but with quick presence of mind he touched the electric self-starter button and the motor immediately started. Quickly putting the car into reverse gear, he backed down the track and out into the road, clearing the track just a second before the train thundered by.

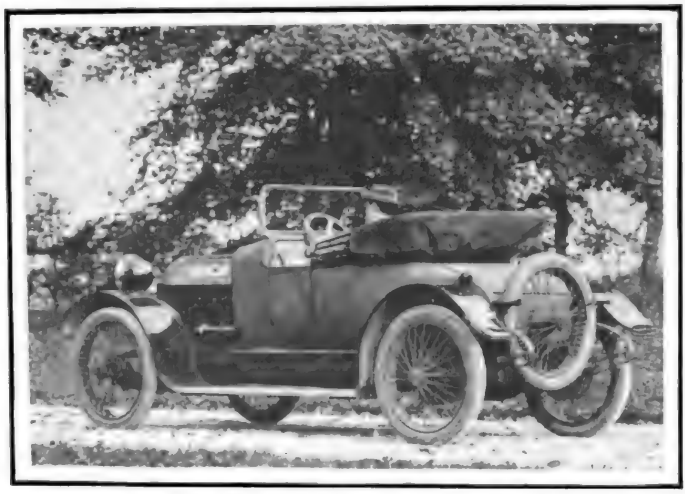
Sentiment Changing—In no states of the union has the prejudice in rural districts against the motor car been as strong as in Louisiana and Mississippi. While there is plenty of this bias to be observed in certain sections, it is a noticeable fact that along the improved roads where motor cars are being used more than any other vehicle that the old spirit has changed. Even the negroes, who are slowest to become reconciled to the new form of transportation, are no longer hostile. As little of the land in Louisiana and Mississippi is fenced, live stock of all kinds is often found in the road. In some cases chickens, pigs and sheep have been killed by motor cars. This, in addition to frightening horses, has been the cause of the prejudice, but as there is no denying, even on the part of the most ignorant, that the good roads have been a result of the motor car, resentment is changing to gratefulness. Off the main lines of travel much of the old sentiment still is found.

Ruling on Insurance—In an opinion given to H. J. Shively, state insurance commissioner, Attorney General W. V. Tanner, of the state of Washington, holds that an insurance company cannot insure owners of motor cars against loss by reason of accidents to their machines, and also against damage for injuries to persons at the same time.

Demands Wide Tires—A campaign against narrow-tired wagons, particularly those designed to carry heavy loads, has been commenced by the good roads committee of the Milwaukee Automobile Club, with special reference to Milwaukee county roads. Concerns employing horse-drawn trucks with narrow tires have been asked to adopt broad felloe wheels taking steel tires or rims of more than 3-inch width. Dairy companies have been requested to ask owners of horse-drawn equipment used to haul milk from depots in the county to Milwaukee to use wide tired wheels.

Sues Milwaukee Promoters—An echo of the results of the postponement of the various events at Milwaukee October 2, 3 and 5, commonly known as the Vanderbilt cup races, is found in the suit instituted at Milwaukee last week by William Wallace, of Philadelphia, Pa., who has extensive business interests in Milwaukee. Mr. Wallace demands the refund of $120 which he paid for admission tickets and reserved seats. The complaint says Mr. Wallace arrived in Milwaukee 2 days before the time originally set for the races, September 17, 20 and 21, and bought tickets which cost $120. When the races were postponed, he made several exchanges and additional purchases of tickets, the net result of which was that he invested $7 more. When the races were postponed again, he found himself unable to wait and was unable to sell his tickets. The suit will be tried in the Milwaukee county civil court on December 2. The result of this lawsuit is awaited with interest as likely to set a precedent that can be used in the future.

Among the Makers and Dealers



NEW HENDERSON MODEL PUT OUT

THE HENDERSON MOTOR CAR CO., Indianapolis, has just announced its new model 47 in touring and roadster form. It is featured by having wire wheels. Such characteristic Henderson features as dash gasoline tank, dynamo lighting system, and left-hand drive are retained

GRANT Joins Jackson Agency—Harry F. Grant, twice a winner of the Vanderbilt trophy, has joined the sales force of the Boston branch of the Jackson car.

Seattle Show in December—Seattle will have a show this year. It will be held in the Armory and last 6 days from December 16 to 21. D. B. Duncombe will stage the event.

Goodyear Still Building—A building permit was issued recently to the Goodyear Rubber Co., of Akron, O., for the erection of a new factory building, which is the sixth one to be erected this year. The building mentioned will be one of the largest that have been erected, the dimensions being 100 by 260 feet and is seven stories high. The cost of the new building will be about $100,000.

Suburban Company Reorganized—The Suburban Motor Car Co., which has in construction a car factory at Ecorse, a suburb of Detroit, has been reorganized under the name of the Palmer Motor Car Co., of which R. A. Palmer, former general manager of the Cartercar company, Pontiac, Mich., is vice-president and general manager. Mr. Palmer also is president of the Palmer-Bee Co., dealer in power transmission machinery and factory equipment. The Ecorse plant is about half completed and it is hoped that it can be finished so that manufacturing may be commenced along about the first of the year, at which time announcement of the type of machines which it contemplates making will be given out by the new Palmer company. W. A. DeSchaum, who designed the Suburban car, will not be connected with the concern.

To Make Chains—The Federal Chain and Mfg. Co. of Springfield, Mass., has purchased from the Atlas Chain Co., of Brooklyn, N. Y., all rights to manufacture and sell Gaylord traction grips for commercial vehicles.

Ramsey Becomes Body Maker—J. J. Ramsey has become vice-president and treasurer of the A. C. Knapp Co., body maker, of Detroit. Mr. Knapp's former connection was with the E. R. Thomas company, Buffalo, of which he was secretary and treasurer.

Fight for Mais Money—Stockholders and creditors of the old Mais Motor Car Co. are making a lively fight in the superior court in Indianapolis to determine which shall receive about $80,000 which is in the hands of Franklin Vonnegut, receiver for the concern. The property and business of the company was sold some time ago to a reorganized company by the same name, headed by Frank H. Wheeler. When the company was in debt about $180,000 and before the receivership proceedings had been brought, creditors agreed to an extension of time if they should receive a payment of $75,000. The company raised $67,000 in cash and a note for $8,000, and paid the money to the creditors. The stockholders now claim that the creditors were to receive nothing unless they received the full amount of $75,000 and that the payment of $67,000 therefore was illegal. They also claim they have a trust interest in the money in the receiver's hands.

Municipal Motor School Planned—Mayor John F. Fitzgerald of Boston is working hard to arrange for a municipal school for instruction free to men who wish to learn how to operate and repair motor cars and trucks. He has sent a communication to the Boston chamber of commerce on the subject.

Opens Branch Warehouse in Atlanta—The H. W. Johns-Manville Co. has recently opened a new southern warehouse at 31½ South Broad street, Atlanta, Ga. The entire building, embracing three floors and a basement, with a total floor area of about 10,000 square feet, will be utilized exclusively as a warehouse for a stock of J-M products.

Adding to Packard Plant—More than 500 orders for the 1913 Packard 38 have been received, the total of advance sales exceeding $2,000,000, it is reported. To expedite the manufacture of the 38 and future models, the Packard plant, already comprising 37 acres of floor space, is being enlarged. Three buildings, constructed entirely of glass, concrete and steel, have been erected to conform to the Packard factory's system of shop units. The additions are practically complete and will be ready for occupancy by January 1.

To Use Manly Drive—The Hydraulic Auto-Truck Corporation has been organized under the California state laws to build commercial vehicles using the Manly hydraulic drive, for which it has secured a license from the Manly Drive Co., of New York city. The directors are: W. E. Barnes; H. W. Whitford, T. W. Burger, T. L. McFadden, D. L. Whitford, J. J. Kinehan and M. R. Jacobs. D. L. Whitford is the general manager. The Hydraulic Auto-Truck Corporation, besides having secured a license to build the transmission, has also secured the agency for the American La France truck, also equipped with this drive, for the Pacific coast states. It is the intention of the company to build trucks of sizes ranging from 1 to 6 tons, and later as the Los Angeles harbor is opened up—which will be immediately upon the completion of the Panama canal—it is its intention to enter that field with its big trucks and trailers. This transportation business, from every indication, will be enormous, inasmuch as the merchants of Los Angeles will be able to transport merchandise some 22 miles with the quickest possible dispatch instead of having to depend upon the railroad, not even excepting the projected municipal

railroad which Los Angeles will build to take care of the tonnage that will be brought to her doors. The general offices are at the corner of Pico and Grand streets, Los Angeles, Cal.

New Luverne Model—The Luverne Automobile Co., Luverne, Minn., has added a four-cylinder chassis of 40 horsepower to its line of six-cylinder pleasure cars. The chassis will be sold from the factory direct only. It is suitable for either business or pleasure bodies.

Farkas Makes a Change—The Cass Motor Truck Co., Port Huron, Mich., has engaged E. J. Farkas, formerly chief engineer of the Cartercar company, Pontiac, Mich., as consulting engineer. He is at present engaged in developing a line of trucks for the concern, and is located at 402 Ford building, this city.

New Tire Ready for Market—The St. Louis Tire and Rubber Co., which has been organized recently in St. Louis, turned out the first solid tire Saturday. This is the first solid rubber motor tire to be made west of the Mississippi river, it is claimed. The company obtained possession of its building on November 6, broke ground for its engine on the same day, unloaded all the machinery from the cars, placed same in running order and turned out a tire in 17 days. J. A. Swinehart, general manager, states that there is no foundation to the report that the St. Louis concern is a branch of the Swinehart company of Akron.

Pushing Work on Axle Plant—Work on the new three-story and basement addition to the Timken-Detroit axle plant is being pushed rapidly. The brick and steel structure is 60 feet wide and 275 feet long. On the first three floors the materials used in the manufacture of Timken-Detroit axles will be stored. On the top floor the general offices of the company will be located. This is the second big addition which has been erected within the year. The two buildings will increase manufacturing space about 33⅓ per cent. One hundred thousand dollars' worth of new machinery will be installed and 300 more men employed.

To Make Moore Trucks—The Palmer-Moore Co., of Syracuse, N. Y., for the past 2 years builder of the Moore two-cycle engine, has increased its capital to $200,000, fully paid in, and is at once to begin the manufacture of motor trucks. T. G. Meacham is president of the corporation; T. W. Meachem, vice-president, and Charles L. Palmer, secretary-treasurer. The large plant of the Syracuse Stove Works, including 3½ acres of land and 90,000 feet of floor space, has been purchased by the new company and is being rapidly equipped with new machinery with a view to turning out the first 200 trucks within 6 months. The type of vehicle to be turned out exclusively at the start will be a 1,500-pound delivery wagon called the Moore. Among the prominent features of this truck will be the air-cooled, two-cycle, slow-speed, variable-port Moore engine and a transmission that automatically provides protection from gear breakage resulting from quick shifts or reversals.

Toledo Chooses December—The date of the Toledo show has been set for January 21-26. There will be plenty of floor space and the show will be open to all who wish to exhibit. The directors of the Toledo Automobile Shows Co. is after the Exposition building on Cherry street.

Moon Dividend Declared—At a recent meeting of the board of directors of the Moon Motor Car Co. a 10 per cent cash dividend was declared upon the capital stock, and payable from surplus. This is the second dividend this year, and the fourth consecutive one for this amount.

Franklin Managers Meet—At the annual conference of the district sales managers of the Franklin Automobile Co. held in Syracuse, N. Y., last week reports coming from all parts of the country indicate that the 1913 season will be larger in point of sales than any other in the history of the company. The conference lasted for 2 days.

Overland Reincorporates—The Willys-Overland Co. was reincorporated last week with a capital stock of $25,000,000, the capital stock of the old concern being $15,000,000. All assets of the concern are taken in by the reincorporation, including the plants at Lima, Elyria and other places. An official made the statement: "Instead of increasing the capital stock of the old company, the company was reincorporated and everything is included in it." The personnel of the present company will not be disturbed by the reincorporation and the officers will remain the same. The incorporators were Walter Stewart, Isaac Kinsey, R. R. Scott, A. H. Smith and G. W. Bennett.

Fire on Chicago's Row—A fire broke out last Thursday in the local store of the Nyberg Automobile Works, 2437 Michigan avenue, Chicago, causing a loss estimated at $15,000.

Van Linden Joins Olds—The Olds Motor Works, Lansing, Mich., now has E. R. Van Linden as its factory manager, G. D. Baker, who formerly held that position, having resigned to become manager of the Diesel engine plant, Ghent, Belgium. Mr. Van Linden held a similar position with the Buick plant No. 1 at Flint, Mich.

New Title for Nelson—E. A. Nelson, the chief engineer of the Hupp Motor Car Co., has given up the active duties of that office and assumed the title of consulting engineer. The position of chief engineer will be taken over by F. E. Watts, his former assistant, and Don T. Hastings, formerly of the Packard Motor Co., will succeed to the title of assistant chief engineer. Together with General Manager C. D. Hastings and Export Manager C. H. Dunlap, Mr. Nelson will sail Saturday for the Paris show. The party will spend the month of December visiting the show and some of the cities of continental Europe, returning by way of London in time for the opening of the New York show. Mr. Nelson will return in February. John L. Poole, European export manager, has called a convention of European dealers to meet the Hupp officials in Paris, and invitations have been issued for the first annual Hupmobile European dealers' banquet at the Hotel Marguery on December 13.

DIVERS RESCUE WATROUS' HUPMOBILE

IT was Howard Watrous who gave Charles J. Glidden 2 days' start over the Glidden trail and then caught up with the tourist before he reached New Orleans. On the return trip Watrous shipped his Hupmobile across Lake Pontchartrain but the boat was wrecked. Watrous rescued his car several days later, divers helping him

Development Briefs

New Woodworth Treads

TO afford a grip on brick, asphalt and ice, a new type of tread has been adopted by the Leather Tire Goods Co., Niagara Falls, N. Y., for its Woodworth treads. As in former Woodworths, the new tread consists of a heavy chrome leather tire covering, stoutly riveted together, and provided with steel studs on the tread for the purpose of reducing wear, securing traction, and preventing skidding. The new arrangement includes, in addition to the five rows of round steel studs, a series of large sharp studs, about 2 inches apart, and staggered, projecting about ¼ inch above the level of the other rivets, which afford a grip on ice and hard snow. These are hardened, and are screwed in place, permitting easy removal and replacement when worn. The former tread fabric is retained, and coil-spring fasteners, that have been used in the past. They are also continued in the full-studded types, especially adapted to rough and rutty roads.

Another feature that is offered for 1913 is the take-up clip. This clip has two adjustments, for standard and oversize tires. These clips, shown in Fig. 2, consist of a clincher hook, which fits

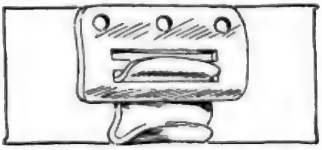


FIG. 2—ADJUSTABLE CLIP OF WOODWORTH TREAD

the clincher rim, and the buckle, into which this hook fastens. The buckle is secured to the leather tread by means of three rivets.

Wagner A. C. Rectifier

For use in charging ignition and lighting storage batteries, the Wagner Electric Mfg. Co., St. Louis, Mo., has produced the alternating-current rectifier shown in Fig. 4. This rectifier takes current from any 110-volt lighting or power circuit, transforming and rectifying it to adapt it to the charging of storage cells. The apparatus consists of three parts in one case. These parts are a small transformer, which steps down the voltage, a vibratory rectifier, to permit current impulses of but one direction to flow into the battery, and a resistance which restricts the flow of charging current. The rectifier consists of a vibrating armature and an electromagnet. The action consists of drawing down the armature by the magnet upon a current impulse of one direction making the contact through the resistance to the battery, and repelling the armature, breaking this circuit, upon the reversal of the alternating current. Thus the current to the battery is in one direction only, and by means of the transformer of moderate voltage. An ammeter is mounted on the outside of the case that permits the operator to judge when the battery

FIG. 1—REMY LIGHTING GENERATOR

is charged. Connection is made to the lighting circuit by means of a length of lamp cord and a plug to fit an ordinary lamp socket. The battery wires are connected to the binding posts, which appear on the lower front face of the device, below the ammeter.

English Motor Phone

Brown Brothers, London, Eng., many of whose devices have been described in these columns, have brought out a loud-speaking motor phone for use in closed cars, which, as is to be expected of a British product, is very elaborate. It is in substance a complete uni-direction telephone outfit, consisting of a transmitter; which greatly resembles an ordinary desk phone cut down, a two-cell storage battery, a coil, and an amplifying receiver. The transmitter is fitted with a ring by which it is hung in a convenient position, within the car, and on the hard rubber handle, a button, which is used to connect the receiver and the transmitter. The wiring is permanent, while the instruments are inserted with plug connections. The receiver is very compact, and is screwed to the side of the car, with the horn opposite the driver's ear. The coil is very small and compact, and the battery is of 8-volts capacity. The advantages of this outfit, are that it is only necessary to speak in an ordinary conversational tone of voice to make oneself heard under any conditions. The phone transmits only when the button is pressed, so that the chauffeur is not permitted to beguile his time listening to the conversation inside, as he is obliged to do with the speaking tube. He receives his orders plainly, but cannot talk back. If desired, the receiver may be placed on the steering column directly beneath the wheel, as in cars where there is no side wall to the driver's compartment.

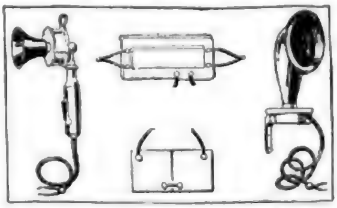


FIG. 3—BROWN MOTOR CAR TELEPHONE

Sealo Tire Treatment

To prevent leaking tubes, the Sealo Tire Co. has produced a substance for injection into the tire that is claimed to prevent leakage of air through punctures, small tube cuts, and to heal porous tubes. It is not claimed to prevent blow-outs, but it

FIG. 4—WAGNER A. C. RECTIFIER

stands to reason that if a loss of air through small leaks is prevented the tire will never flatten and sustain the injuries attendant on running on soft tires; which are said to be the cause of nine-tenths of blowouts. Wear, or deep gashes alone, therefore, can cause a Sealo-treated tire to explode, according to the makers.

Sealo is simply a secret compound which is injected into the tire in the proportion of 1 part Sealo to 9 parts air, and the tire inflated to normal pressure. It is said to retain its fluid state indefinitely, and to be non-injurious to tires. It is about the consistency of thick cream, and is not sticky. When the car is at rest the fluid occupies the lowest portion of the tire, completely filling it from rim to tread. In this manner it reaches the side-walls of the tire when running slowly. When running at normal speed the compound is distrib-

Novelties for Motoring

uted evenly about the inner surface of the tire. Upon any puncture of the tire the Sealo is forced through the aperture by the pressure of air behind it, where it hardens immediately, and is said to combine with the rubber of the tire, constituting a permanent closure.

Lubro Anti-Freeze Fluid

Those hardy motorists who defy the hibernation edict of Jack Frost, and keep their cars in commission in zero weather, will be interested in Lubro, the product of the Lubro Oil Co., Cleveland, O. This is a commercial anti-freeze fluid, ready for use, said to be in many ways superior to home-made mixtures. Lubro is a secret compound which has been used in the locality of the factory for about 4 years, with evident success, and is now being offered for sale generally. It is composed of ingredi-

FIG. 5—NEW WOODWORTH SAFETY TREAD

ents which are harmless, it is claimed, and which serve to lubricate the pump, and are said to prevent the formation of rust and scale. Lubro is red in color, and its strength in solution may be readily determined. Leaks in the radiator are also easily detected, and garage men are not likely to drain out the radiator if the red color is observed. In a test conducted in Cleveland three bottles of the fluid were frozen in a solid cake of ice without congealing. At temperatures below zero the fluid will solidify, but in so doing will not expand. In use the radiator is drained and cleaned and 1 gallon of Lubro to 2½ gallons of water poured in. This solution is claimed to be sufficient for a season.

Vulko-Fiberene

On the theory that the bulk of tire trouble is the direct or indirect result of loss of air through punctures, the Vulko-Fiberene Co., Oklahoma City, Okla., offers Vulko-Fiberene as a preventative of punctures, without sacrificing the resiliency that is inseparable from air. This compound is claimed to be harmless to rubber or fabric, and is injected in such small quantities as to be a negligible impairment

FIG. 6—CONTROL SWITCH PLATE OF REMY LIGHTING SYSTEM

of the riding qualities of the car. The principle of action is as follows: As the tire revolves, the fluid is thrown out by centrifugal force in the form of a coating over the interior of the tire. A puncture is instantly closed, according to the claims of the manufacturers, by the pressure of the air through the fluid, which forces it into the opening, thus effecting a closure like a cork in a bottle.

If the object that has caused the puncture remains in the tire, no air is lost, is the claim, while if it is withdrawn the closure is made permanent. The claims of the manufacturer are broader than merely that the substance is harmless to the tire, as it is asserted that as the tube is kept moist within at all times, dry rot is prevented.

Remy Lighting Dynamo System

Complete for use with 6-volt standard headlights, the Remy electric lighting system is shown in Fig. 7. This system is the product of the Remy Electric Co., Anderson, Ind. It consists of a dynamo, Fig. 1, a composite switch, fuse block and distribution block, and an ammeter.

The dynamo is of the differentially-compound wound type, the series winding opposing the shunt winding so as to produce a characteristic curve in which the maximum voltage is reached at moderate speed, above which no increase of output is produced, which makes all complicated slipping clutches, governors, etc., unnecessary. The armature is of the slotted drum type, with skewed slots, which have the effect of producing silence. A reverse current relay is placed above the commutator. This consists of a differentially-wound electro-magnet, which closes a contact, connecting the generator with the battery, when the flow of current is from the generator to the battery, but which breaks it, when the output falls below the amount of the battery charge, thus preventing discharge of the battery through the armature.

Two wires connect the dynamo with the combination switch, fuse block and distributor block. From here two wires connect the cells of the battery in series with this circuit. The lamps are fed from the battery on the three-wire plan. This is necessary, because the output of the dynamo is 12 to 13 volts, this capacity doing away with all commutator troubles that result from low voltages, it is claimed. The lamps are of the standard 6-volt type and are connected to the neutral and positive or negative poles of the battery circuit, respectively, so that each receives but 6 volts from the battery. The switch, Fig. 6, is a single wing key, and provides positions wherein the side and tail, all, or head and tail lights are lit, with an off position at either end. The operator has no control over the charging of the battery, as the reverse current relay governs this entirely. The ammeter is provided as a telltale for the operator, informing him of any derangement in time to remedy it before the exhaustion of the battery. The ammeter lamp is connected in series with the tail light, so that it serves as a telltale on this member; any failure of the tail light causing the ammeter light to go out.

It is claimed that the dynamo generates sufficient current to light all of the lights at an average car-speed on high gear of about 13 miles per hour, and that its maximum output is reached at about 2,000 revolutions per minute. It is a peculiar feature of this outfit that with the lamps off the generator does not generate as much current as with them on.

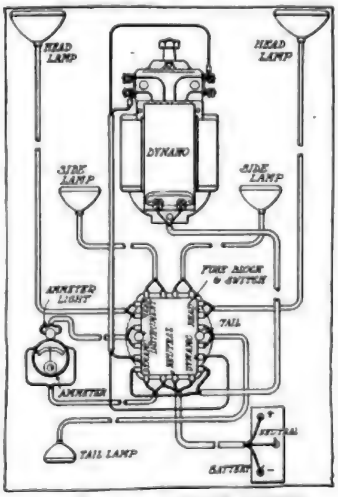


FIG. 7—PLAN OF REMY SYSTEM

Brief Business Announcements

Agencies Appointed by Motor Car and Truck Manufacturers

PLEASURE CARS

Town—	Agent	Car
Albany, Ga.	C. E. Fryer	Lozier
Albany, N. Y.	James N. Kemp Machine Works	Henderson
Alliance, Neb.	N. C. Pederson	Mason
Archer, Neb.	W. T. Grace	Nyberg
Arapahoe, Neb.	G. W. Gearhart	Cartercar
Armington, Ill.	R. L. Kampf	Warren-Detroit
Attleboro, Mass.	W. B. Hollander	Metz
Baltimore, Md.	Auto Outing Co.	Little
Baltimore, Md.	Henderson Motor Sales Co.	Henderson
Binghamton, N. Y.	Earl Knickerbocker	Henderson
Blockton, Ia.	Asa Terrill	Hupmobile
Brawley, Cal.	Donald & Lee	R. C. H.
Broken Bow, Neb.	Broken Bow Auto Co.	Cartercar
Bloomington, Ill.	J. E. Hanson	Warren-Detroit
Brockton, Mass.	Fisher-Nickerson Co.	Little
Bridgewater, Mass.	H. C. White	Overland
Brunswick, Ga.	F. D. Aiken's Sons	Henderson
Butte, Mont.	Montana Sales Co.	Lozier
Cedar Rapids, Ia.	Cedar Rapids Auto Co.	Lozier
Chenoa, Ill.	M. M. Heintz	Warren-Detroit
Chebanse, Ill.	Kirk & Willet	Warren-Detroit
Chicago	H. T. Farrar	R. C. H.
Cincinnati, O.	Victor Gluchowsky	White
Cleveland, O.	Brandt Motor Car Co.	Moon
Columbus, O.	Norman M. Johnston & J. W. Pelton	R. C. H.
Columbus, O.	S. W. Schott & Co.	Empire
Council Bluffs, Ia.	T. A. Mitchell	Studebaker
Crescent City, Ill.	Crescent Garage & Supply Co.	Warren-Detroit
Denver, Colo.	Mathewson Auto Co.	Lozier
Des Moines, Ia.	Lagerquist Carriage & Auto Co.	Detroiter
Dixon, Neb.	R. Paul	Mason
Elizabethville, Pa.	Homberger Brothers	R. C. H.
Emmitsburg, Md.	Emmitsburg Garage Co.	Ford
Fall River, Mass.	Eckberg-Place Garage Co.	Franklin
Frederick, Md.	Ideal Garage	Ford
Geneva, Neb.	W. H. Menking	Nyberg
Gilman, Ill.	Gilman Auto Sales & Service Co.	Warren-Detroit
Hagerstown, Md.	D. F. Hill Sons	Ford
Hamilton, O.	Hamilton Motor Car Co.	Moon
Hancock, Md.	J. F. E. Fields	Ford
Harrisburg, Ill.	Cummins Motor Car Co.	Henderson
Hartford, Conn.	Howard D. Graves	Henderson
Hastings, Neb.	C. W. Jacobs	Cartercar
Haverhill, Mass.	Smith & Johnson	Lozier
Hayworth, Ill.	F. A. Ball & Co.	Warren-Detroit
Hampstead, Md.	G. E. Cox	Ford
Honolulu, H. I.	Von Hamm-Young Co.	Lozier
Lake Forest, Ill.	Joe O'Neill	R. C. H.
Latrobe, Pa.	Latrobe Auto Co.	Lozier
Lowell, Mass.	Lowell Auto Corp.	Little
Lowell, Mass.	Lowell Auto Corp.	Oakland
Malvern, Ia.	I. G. Bliss	Nyberg
Manchester, N. H.	H. L. Taylor	Lozier
McCools, Neb.	McCools Machine & Iron Works	Cartercar
Mechanicsburg, Pa.	G. C. Brenner	Henderson
Memphis, Tenn.	Chickasaw Motor Car Co.	Moon
Minneapolis, Minn.	Fawkes Automobile Co.	Premier
Mitchell, S. D.	Central Auto Supply Co.	Moon
Mondovi, Wis.	G. P. Goddard, Jr.	Detroiter
New Haven, Conn.	Knowles & Collins	Henderson
New Haven, Conn.	Stutz Auto Co.	Stutz
Nowata, Okla.	H. G. Cheny	Lozier
Oklahoma City, Okla.	Broadway Garage	Lozier
Orleans, Neb.	Lideen Hardware Co.	Cartercar
Palmer, Ia.	J. I. Johnson	Henderson
Paxton, Ill.	E. V. Kirby & J. B. Busey	Warren-Detroit
Peoria, Ill.	Warren Motor Car Sales Co	Warren-Detroit
Portland, Ore.	H. L. Mann	Henderson
Portland, Me.	Speare Auto Co.	Flanders
Preston, Md.	Garris & Covy	Ford
Providence, R. I.	J. B. Higginson	Henderson
Pulaski, Ga.	George O. Franklin	Henderson
Rosalie, Neb.	T. Lake	Mason
Salem, Va.	J. P. Saul, Jr., & F. L. Sheller	R. C. H.
Scribner, Neb.	William A. Kurz	Nyberg
Sharon, Pa.	W. C. DeForrest & Son	Lozier
Sheboygan, Wis.	Sheboygan Auto & Supply Co.	Kissel Kar
Sheboygan, Wis.	John Cuddy	Baker
Sheboygan, Wis.	Clarence Garton	Cadillac
Shelbyville, Ind.	John H. Siefort	R. C. H.
Shenandoah, Ia.	Hand & Woodard	Rambler
Shreveport, La.	Orme Motor & Transfer Co.	Moon
Springfield, Ill.	Ajax Motor Sales Co.	Henderson
Springfield, Mass.	R. A. McKee	Mitchell
St. Louis, Mo.	T. J. Moss & J. B. Kavanaugh	Staver
St. Louis, Mo.	Lindell Automobile & Repair Co.	Cutting
St. Louis, Mo.	Bagnell Auto Co.	Lozier
Spencer, Neb.	W. P. Moore	Nyberg
Superior, Neb.	Jack Galbreth	Rambler
Superior, Neb.	L. R. Kesterson	Hupmobile
Taunton, Mass.	Short's Garage	R. C. H.
Texarkana, Tex.	Paul Jones	Moon
Toronto, Can.	American Motor Sales Co.	Henderson
Urbana, Ill.	F. E. Stringer	Warren-Detroit
Valley, Neb.	Johnson & Clark	Studebaker
Washington, Pa.	T. H. Sutherland	Henderson
Whitehall, Md.	Anderson & Wiley	Ford
Wichita Falls, Tex.	Motor Supply Co.	Lozier
Wilkes-Barre, Pa.	Thomas W. Haines, Jr.	Moon
Worcester, Mass.	Cashman Auto Co.	Flanders

TRUCKS

Town—	Agent	Car
Allentown, Pa.	Allen Motor Co.	Stewart
Baltimore, Md.	R. Stuart Beaver	Stewart
Buffalo, N. Y.	Reinold Brothers	Stewart
Cleveland, O.	Henry E. Ricker & Co.	Stewart
Edmonton, Alb., Can.	Northrup M. Service Co.	Stewart
Houston, Tex.	Young & Dwire	Stewart
Los Angeles, Cal.	Albert Biner	Stewart
Nashville, Tenn.	Martin & Crocker	Stewart
Salem, Mass.	North Shore Motors & Service Co.	Stewart
Savannah, Ga.	Savannah Motor Car Co.	Stewart
St. Louis, Mo.	Federal Truck Co. of St. Louis	Stewart
Philadelphia, Pa.	Gomery-Schwartz Motor Car Co.	Stewart
Portland, Ore.	Coast Commercial Car Co.	Stewart
Rochester, N. Y.	Mandery Motor Car Co.	Stewart
St. Paul, Minn.	Borge & Wharry Motor Co.	Stewart
Utica, N. Y.	Crim-Bronner Auto Co.	Stewart
Wilkes-Barre, Pa.	Koon & Haller	Stewart
Wilmington, Del.	Gomery-Schwartz Motor Car Co.	Stewart

CHICAGO—A. M. Stryker has been added to the staff of the Stewart & Clark Mfg. Co. Mr. Stryker is now in charge of the advertising.

Beloit, Wis.—The Beloit Auto and Machinery Co. has been incorporated by C. F. Brewer, Jerome Davis and R. J. Davis to operate and conduct a garage, selling agency and repair works. The corporation is capitalized at $10,000.

Buffalo, N. Y.—Henry Riker & Co., of Cleveland, have been appointed to act as state distributors for Ohio for the Stewart Motor Corporation, manufacturer of light delivery trucks. The Riker concern will have headquarters in Cleveland, where a large service station is to be fitted up on Euclid avenue. The entire state will be covered by a number of traveling representatives working out of the Cleveland office.

Bridgeport, Conn.—M. V. Doud, formerly eastern sales manager for the Locomobile company, has formed the D. and H. Auto Distributing Co. here for the exclusive sale of Kline cars. He will act as general manager and treasurer of the company and will be associated with John Heapler and G. H. Crauford in the business. Mr. Heapley is president and Mr. Crauford vice president.

EDITOR'S NOTE—Through an error in last week's Motor Age a large number of motor car dealers recently secured by the Stewart Motor Corporation, Buffalo, N. Y., were credited to the Lippard-Stewart Motor Car Co. of that city. These two concerns are entirely separate and distinct. The Stewart Motor Corporation, which began business in the early fall, is headed by T. R. Lippard and R. G. Stewart, both of whom previously withdrew from the Lippard-Stewart Motor Car Co. The dealers wrongly credited last week are republished properly credited this week.

Philadelphia, Pa.—The Longstreth Motor Car Co., local distributor of the Alco line, is now located in its new sales and service building, 2126 Market street.

Milwaukee, Wis.—A. F. Timme, for several years vice-president and general manager of the Kopmeier Motor Car Co., 375-389 Summit avenue, Milwaukee, has established a plant at 315-319 Mineral street, Milwaukee, for the manufacture of the Shirley engine starter and auxiliary power.

plant. P. H. Presentine, formerly business manager at Kopmeier's, is sales manager of the new Timme concern.

Owen, Wis.—Guy E. Huntington, of Pulaski, has leased the Elert-Barton building at Owen, and will open it as a garage and salesroom on December 15.

San Antonio, Tex.—Birdsong & Potchernick, Franklin dealers in this city, have just moved into a new and well-equipped salesroom and service station at 104 Avenue D, near the new Alamo Plaza.

Milwaukee, Wis.—Charles R. Johnson has been appointed manager of the Kopmeier Motor Co., 375-389 Summit avenue, representing the Fiat, Chalmers and Flanders electric. Mr. Johnson succeeds John McDonald.

Fort Atkinson, Wis.—A. E. Puerner has sold his garage and agency business at Fort Atkinson to the Hofmeister Motor Co., of Waterton, Wis., which will conduct it as a branch. Mr. Puerner retires because of ill health.

Appleton, Wis.—The Lion Liner Co. has been organized here to manufacture and market a newly patented inner liner for pneumatic tires. The company has been incorporated with an authorized capital of $5,000. The owners are Anton Scheurle, Edward Greve and Fred C. Goodman.

Milwaukee, Wis.—John G. Wolleager has organized the Wolleager Sales Co., to continue the business of the Milwaukee branch of the Studebaker Corporation, of Milwaukee. Temporary quarters have been established in the salesrooms of the former Studebaker Milwaukee branch in the Stroh building, Michigan and Jackson streets, and about December 1 the company will occupy the former Jonas-Cadillac garage at 417-421 Wells street.

Philadelphia, Pa.—J. Perkins, for several years superintendent of the Saurer motor truck factory of the International Motor Co. at Plainfield, N. J., has resigned his position there to become the superintendent of the Rushmore Dynamo Works, Plainfield.

Chippewa Falls, Wis.—The Jenkins Automobile Co., owned and managed by Judge F. M. Jenkins, is having plans prepared for a large new garage building, which will be the home of the Mitchell, Paige and Regal. The building will cost in the neighborhood of $15,000.

New York—A. Gale Thomson, who for 16 years has represented the Joseph Dixon Crucible Co. of Jersey City in the Pacific coast territory, has been made sales manager for the motor car department of that company in the east. His headquarters are at 68 Reade street, New York city.

Portage, Wis.—The Portage Boat and Engine Co., manufacturing manual and power boats and motors, intends to build a large garage at Portage. The building will have ground dimensions of 40 by 132 feet, one story and basement, of fireproof construction. At present the motor car selling, repair and storage business is conducted at the boat factory.

New York—John B. Maus, recently connected with the Goodyear Tire and Rubber Co. as manager of its New York branch, has joined the United States Tire Co.'s selling forces in the capacity of special assistant to O. S. Tweedy, eastern district manager. Mr. Maus will have his headquarters in New York, but will spend much of his time at the various branches in the eastern territory.

Detroit, Mich.—The Michigan Motor Car Co. has added to its sales department E. A. Welch, who becomes sales manager of the Michigan for the middle and eastern states. His territory includes all the states east of a line from Chicago to New Orleans. While Mr. Welch will keep his residence in Kalamazoo, he will travel this entire territory.

Indianapolis, Ind.—The Great Western Auto Sales Co. has been formed in Indianapolis by C. E. Williams and J. E. Williams and will distribute the Great Western line of cars in Indianapolis and vicinity. Quarters have been taken at 425 North Meridion street, where a full line of samples of the Great Western cars are being displayed.

Sheboygan, Wis.—The Sheboygan Auto and Supply Co. will start work on the proposed addition doubling its capacity. It was intended to commence building operations in the spring of 1913, but the company has just taken the Kisselkar agency, and this with the enlargement of the Studebaker line have made immediate action necessary.

Toronto, Ont.—Leonard J. Sievert, of Toronto, who was until recently connected with the Russell Motor Car Co., has been engaged to act as one of the Canadian representatives for Red Head spark plugs, Red Rib cable, E. G. bumpers and other Grossman specialties. His territory comprises that part of Canada as far west as Winnipeg, Man.

Recent Incorporations

Argyl, Pa.—National Transportation Co., capital stock, $100,000.

Barker, N. Y.—Progressive Motor Car Co., capital stock, $30,000; incorporators, A. H. Tersleeson, J. B. Smith, H. S. Schuhr.

Boston, Mass.—Anderson Electric Car Co., capital stock, $10,000; to deal in motor cars, incorporators, A. Weatherby, A. E. Yont, F. R. Keith.

Boston, Mass.—Pope Hartford Co., capital stock, $100,000; to manufacture motor cars, incorporators, G. L. Dodd, C. W. Cousers, F. H. Lucas.

Bridgeport, Conn.—Locomobile Co. of Missouri, capital stock, $10,000; incorporators, A. M. Marsh, D. S. Day, S. Stoddard.

Brookline, N. Y.—Coolidge Corner Garage Co., capital stock, $5,000; directors, S. R. Davis, F. O. White, C. Brener.

Chicago—L. C. Kuhnert, Jr., Co., capital stock, $30,000; to manufacture engines and mechanical devices; incorporators, L. C. Kuhnert, Jr., C. O. Ryde, S. Adler.

Chicago—Mollitor Tire Co., capital stock, $100,000; incorporators, B. S. Lippincott, B. D. Towne, W. J. Higgins.

Chicago—Edgar Motor Livery Co., capital stock, $10,000; incorporators, J. Edgar, E. A. Zimmerman, A. L. Meyers.

Cleveland, O.—Victor Brass Mfg. Co., capital stock, $25,000; to manufacture motor car parts, etc.; incorporators, M. L. Tonne, W. J. Mahon, A. M. Fiebach, T. B. Pelton, F. M. Pelton.

Daytona, Fla.—Daytona Auto Supply Co., capital stock, $1,000; incorporator, A. G. Hunt.

Dunkirk, N. Y.—Niagara Motors & Mfg. Co., capital stock, $275,000; incorporators, E. J. West, D. W. Fry, M. M. Hedden.

Fond du Lac, Wis.—R. C. Wells Mfg. Co., capital stock, $200,000, to manufacture motor car accessories.

Ft. Wayne, Ind.—Auburn Auto Co., capital stock, $15,000; directors, F. Eckhart, A. Schultz, A. M. Horstmann, L. Watson.

Hartford, Conn.—Auto-Owners' Supply Co., capital stock, $50,000; incorporators, G. H. Peck, I. G. Cranton, R. S. Kilbourne.

Mansfield, O.—Brucker Motor Car Co., capital stock, $5,000; to deal in motor cars and accessories; incorporators, D. D. Brucker, W. F. Voegle, Jr., L. Brucker, A. E. Courtney, J. M. Ottinger.

Marion, Ind.—Marion Garage & Auto Co., capital stock, $15,000; to manufacture motor car parts; incorporators, B. Custer, E. S. Payntor, J. P. Butterworth.

Manhattan, N. J.—Commercial Trucking & Terminal Corp., capital stock, $150,000; to do trucking business; incorporators, W. H. Rankin, J. W. Wilks, W. Markle.

Nashville, Tenn.—White Motor Co., capital stock, $10,000; incorporators, S. A. Craig, G. A. Puryear, W. H. Hyde, E. S. Craign, E. E. Wood.

Naugatuck, Conn.—Richardson Auto Co., capital stock, $10,000; incorporators, J. E. Lundin, A. R. Richardson, O. E. Richardson.

Newark, N. J.—American Auto Radiator Co., capital stock, $25,000; to manufacture motor car radiators; incorporators, M. Steiner, S. Goldstein, A. Marcus.

New Brunswick, N. J.—Middlesex County Garage & Sales Co., capital stock, $100,000; incorporators, H. A. Boyd, J. Mershon, C. A. Oliver.

Newcastle, Ind.—Rose City Auto Co., capital stock, $10,000; directors, F. E. Smith, C. W. Mouch, W. Byrket, Howard M. Van Matre.

New York—Auto Record Publishing Co., capital stock, $10,000; to publish motor car magazine; incorporators, C. A. Loring, J. W. Buckmaster, I. E. Buckmaster.

New York—Auto Exchange & Equipment Co., capital stock, $1,000; incorporators, H. Lauterbach, I. Lauterbach, C. A. Spencer.

New York—Gross Auto Rental Co., capital stock, $5,000; incorporators, J. S. Gross, S. Gross, H. Strizver.

New York—Joseph H. Penders, capital stock, $25,000; to manufacture and deal in motor cars; incorporators, J. H. Penders, E. Penders, C. Hahr.

Philadelphia, Pa.—Fortman Mfg. Co., capital stock, $100,000; to manufacture motor cars.

Pittsburgh, Pa.—American Motor Fire Apparatus Co., capital stock, $1,000,000; to manufacture motor car machinery and fire trucks; incorporators, P. F. B. Bithell, P. S. Chambers, T. L. P. Farr.

Richmond, Va.—Colonial Beach Motor Co., capital stock, $1,000; incorporators, F. W. Alexander, G. Staples, H. W. B. Williams.

Rochester, Ind.—Rochester Garage & Machine Co., capital stock, $15,000; to do repair business; incorporators, E. R. Creamer, O. C. Davisson, J. O. Gemin.

Rotterdam, N. Y.—General Vehicle Co., capital stock, $10,000,000; incorporators, A. H. Jackson, S. L. Whitestone, J. F. Zoller.

South Bend, Ind.—South Bend Motor Car Co., capital stock, $10,000; to manufacture motor cars; incorporators, J. D. J. Carneman, A. C. Keeklenburg, H. Hammond.

St. Louis, Mo.—Auto Products Co., capital stock, $25,000; to manufacture motor car parts and accessories; incorporators, W. W. Smoot, A. E. Smoot, E. B. Stinde.

Toledo, O.—Toledo Auto Shows Co., capital stock, $10,000; to conduct motor car shows; incorporators, F. L. Mulholland, A. A. Atwood, H. W. Blevins, J. W. Banting, Guy R. Ford, S. Roberts.

Toledo, O.—Willys-Overland Co., capital stock, $25,000,000; to manufacture motor cars; incorporators, W. Stewart, I. Kinsey, R. R. Scott, A. H. Smith, G. W. Bennett.

Wabash, Ind.—Sterling Absorber Co., to manufacture springs; directors, M. Tillman, C. Huff, J. Kaiser.

White Plains, N. Y.—General Rim Co., capital stock, $150,000; to supply motor vehicles and accessories; incorporators, W. Kaul, R. W. Ashlacy, F. Oberkirsch.

Wilmington, Del.—Zee Zee Tire & Rubber Co., capital stock, $1,000,000; to manufacture and deal in motor cars.

The Motorist's Kindergarten

EDITOR'S NOTE—Motor Age is publishing in this department a series of non-technical explanations of the various parts of motor cars for the benefit of the reader who knows nothing about them. The subjects will be dealt with in the most elementary manner, so that the series when completed will form a simple elucidation of the car.. The first article appeared October 10, 1912.

Air-Cooling Systems

IN the so-called air-cooling systems used in motor cars the air is used directly to carry away the heat from the cylinders instead of through the medium of water, as in the water-cooling systems described last week. The simplest and earliest form of air-cooling arrangements is that in which the cylinders are cast with circular flanges around their outside so that the surface of the outside of the cylinder over which the air passes will be greater than it would be if the cylinder were left smooth. Air is made to pass around the cylinders, by a fan of some sort placed either in front or at the rear of the motor. In both cases the action of the fan is supplemented when the car is moving by the rush of air caused by the car's motion through it. As the air passes around the outside surface of the cylinder, the heat in the metal of the cylinder from the burning gas within it is given up to the air.

The larger the outside surface of the cylinder, the more air will come in contact with it, the more rapidly will the heat be taken away, and the cooler will the cylinder keep. So the chief effort in air-cooling is to make the radiating surface of the cylinder as large as possible, without having it take up too much room under the bonnet, and to make the air circulate as rapidly as possible.

Cylinders are made in several ways to increase their radiating surface. Sometimes, in addition to the circular flanges mentioned above, there are cast radial flanges on the head, so that the cylinder, has the appearance of the one illustrated in the left-hand sketch in Fig. 10. This practice is very common in the design of motor-cycle engines. In these engines the flanges are simply cast in the cylinder and left that way without further work on them, but in many motor-car engines the flanges after casting are machined down to make them thinner and deeper so as to increase the rate of radiation of the heat from them.

A very unique method is that employed in the motors of the Duryea buggy-type cars. The flanges are cast around the cylinder, and to them are fastened long flat spines or strips, radiating in every direction, so that the cylinder has very much the appearance of a cast-iron porcupine. This is illustrated at the center of Fig. 10. As the motor is so arranged that the air has direct access to the cylinders, and the spines offer an immense cooling surface, this makes a very efficient cooling system and the fan is not really needed.

One of the most thoroughly developed air-cooling systems is that which has been employed for so many years on the Franklin cars. This arrangement is illustrated at the right of Fig. 10, which shows one of the older four-cylinder Franklin types.

It will be seen that on the outside of the cylinders there are vertical flanges which extend straight out from the cylinder wall in all directions. Then, around each cylinder there is a sort of stove-pipe and connecting these stove-pipes there is a flat sheet-metal pan which is bent down at its edges and fastened to the frame in such a way that there is no connection between the upper part of the bonnet and and the lower part of the engine except through the flues or stovepipes around the cylinders. Any air that passes from the upper to the lower part of the engine consequently passes between these vertical flanges.

Now, the lower part of the engine is made air-tight except for the flues around the cylinders and an opening at the rear to a very efficient form of suction fan mounted on the crankshaft. This draws air out of the lower compartment of the engine so that more air rushes in through the screen in the front and down through the flues around the cylinders to replace it. One of the great troubles in air cooling was due to the fact that in engines of more than one cylinder, the cylinders in front prevented those in the rear from receiving their full supply. This method, however, obviates that difficulty.

Similar to the system just described is the one employed on the Kelly trucks and known as the Frayer-Miller system. In this the air is forced by a comparatively powerful blower at the front end of the motor through a flue leading over the top of the engine. Jackets surrounding the cylinders open into this flue at their tops and are open to the air at the bottom. The cylinder heads are provided with vertical flanges much like those of the Franklin, but in addition the surface of the cylinder wall is increased by a large number of spines which are an integral part of the cylinder. The blower forces a blast of air at a rather high pressure into the flue above the motor and the only escape for it is through the air jackets, passing around the hot portion of the cylinder.

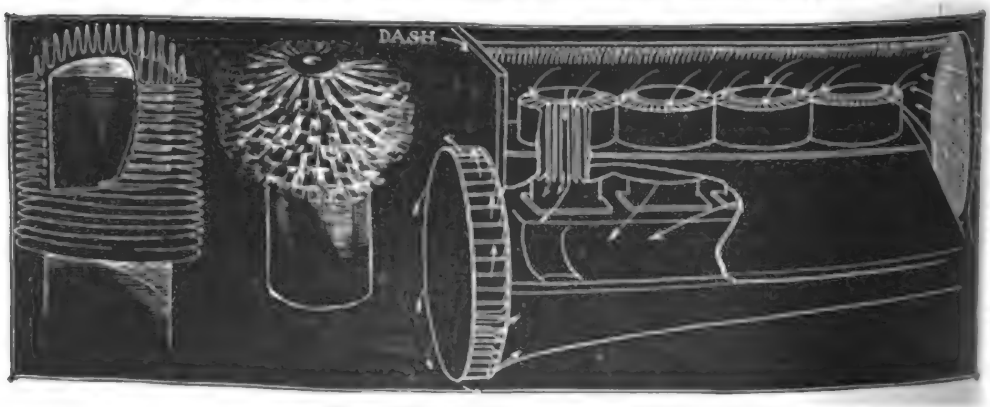


FIG. 10—THREE METHODS OF AIR-COOLING

OTOR AG

housand

through Colora

iewing the Foreigner

Absence of Vibration Is One of the Features in the

HAYNES

Electric Starting and Electric Lighting

Vibration has been done away with in the Haynes by making the frame flexible as well as sturdy and by the perfect balance of pistons, crankshaft, camshaft, fly wheel and connecting rods. These parts are not only balanced individually; each pair of reciprocating parts are balanced to a nicety of precision.

And stop to consider what this absence of vibration means. It means more than mere riding comfort. It means that every working part of the car is performing its function perfectly—without needless wear and without waste of power. It means economy of fuel. It means long life for the car with a minimum expense of up-keep. And with these economies there is the economy in the first cost of the Haynes.

The Haynes represents in every way the maximum of automobile efficiency at the very minimum of cost.

See Extraordinary Announcement of New Haynes Model in Next Week's Issue of Motor Age

The Haynes is the kind of car discriminating buyers want. If there isn't a Haynes dealer in your territory write us about agency.

Haynes Automobile Company, 501 Union St., Kokomo, Ind.

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DEPARTMENTS

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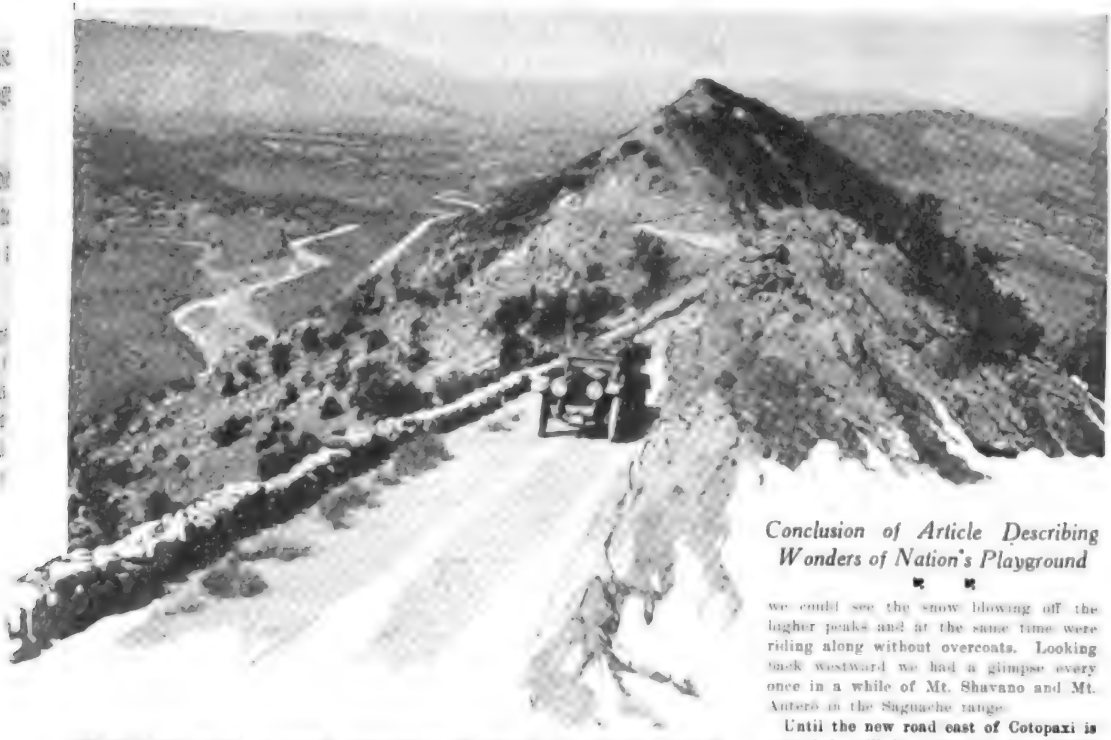
MOTOR AGE

One Thousand Miles Through Colorado

Part 4—The Skyline Drive

By John P. Dods



THE SKYLINE DRIVE. A MOTOR BOULEVARD ON TOP OF A MOUNTAIN RANGE

Conclusion of Article Describing Wonders of Nation's Playground

We started out Thursday morning from Salida with a great deal of enthusiasm for the ride down the Arkansas, as we had been told in no measured words about the road conditions and general beauty of the ride. We were in no way disappointed; in fact, the first 25 miles to Cotopaxi was one of the most beautiful in Colorado, although not a thriller like some pieces of the road we had been over along the edge of the cliffs or deep into canyons. Just as soon as the new road between Cotopaxi and Parkdale is finished it will be complete all the way between Salida and Canon City.

This first 25 miles is a well improved road of decomposed granite all the way, wide enough to pass at any time and quite close to the river for the whole distance. The valley is broad enough so that there is considerable farming. Add to this the wonderful snow caps of the Sangre de Cristo range in the south which seem to come right down almost to the river and you can imagine, perhaps, what an ideal trip it is. These snow caps were so close we could see the snow blowing off the higher peaks and at the same time were riding along without overcoats. Looking back westward we had a glimpse every once in a while of Mt. Shavano and Mt. Antero in the Saguache range.

Until the new road east of Cotopaxi is opened it will be necessary for tourists to go over the road we traversed, crossing Texas creek at the Coleman range, thence down Copper gulch. This is quite a bit longer than the new road, but conditions are excellent, particularly on the first part of the ride, which is a long easy upgrade most of the way to Coleman's ranch. Just beyond that we turned up a dry creek, which is crossed and recrossed many times, and just after coming into the road from West Cliff we went down the Copper gulch road, literally in the creek bed most of the way. As this is dry 90 per cent of the time there is no trouble; in fact, con-

AT THE TOP OF UTE PASS ON THE LINCOLN HIGHWAY WITH PIKE'S PEAK IN THE DISTANCE

OVERLOOKING CANON CITY FROM TOP OF SKYLINE DRIVE: SHOWING A CONNECTING ROAD

sidering the location of the road, it is remarkably good.

Crossing the Arkansas just east of Parkdale, 55 miles out of Salida, we stopped to take some pictures of our first sight of a convict camp. This camp was just about to break up, as the convicts had the day before completed the new grade over Parkdale hill; nevertheless, we had an excellent opportunity of getting some good pictures of the way this work is carried on. After reaching the top of Parkdale hill, the present road winds across the top of the plateau, beginning the downgrade into Canon City at 59 miles. The survey has already been completed from the top of Parkdale hill to make a direct connection from this point to the top of the Royal Gorge route so that tourists coming in this direction can take in this wonderful sight without retracing their steps. The nearer we got to Canon City the more wonderful became the road and we were all frank in stating that we had never seen anything so marvelous anywhere.

Coming down along Sand creek into the city we passed the roads leading to the top of the Royal Gorge and also the Skyline Drive. As we were to have lunch with Warden Tynan at the penitentiary we put off these side trips until afternoon. After luncheon, with C. R. McLain, president of the Rainbow Route, as escort, we first made the trip to the top of the Royal Gorge, 10 miles from the center of the city.

Practically every foot of this road after leaving the main highway, 3½ miles out, has been constructed on a new grade under the convict system and, with the possible exception of the Skyline drive, we saw no more wonderful bit of road construction on our whole trip. It was almost constantly upgrade and although there is only one short pitch of about 16 per cent in Priest canyon, it is so winding that at some points three tiers of roads could be seen below. Coming out of the top of the Royal Gorge we could drive almost to the edge where we could look down into the bottom of the gorge.

On our return trip we went up onto the Skyline drive and spent nearly an hour on what is probably the most wonderful 2 miles of road in the world. Even the pictures are most inadequate in expressing what a marvelous thing it is to drive along on the top of this hogsback road 800 and 900 feet above the city.

Canyon City's Drives

By government and state grant Canon City has acquired, as a part of the city park system, the property on which both the Skyline drive and Royal Gorge routes are located. No city can boast of anything to quite match these drives, but Canon City does not seem satisfied, but is at work constructing what is known as the Tunnel drive which will go part way up the Royal Gorge just above the rail.

TERRITORY COVERED BY LAST 2 DAYS OF COLORADO TRIP

road. We spent so much time going over these routes and accepting the hospitality of Canon City people we decided to stay over and make an early start the next morning. Therefore, we were on our way again Friday morning before 7 o'clock.

A short stop was made in Florence to meet the people there and we then went direct to Pueblo on a fine road all the way. As the Pueblo enthusiasts expected that we would stay over there for lunch, we stopped 1½ hours, but we were very anxious to complete our trip by Saturday night and had 400 miles to go.

We left Pueblo at 11 o'clock and went into Colorado Springs on a road that would be the envy of most eastern communities. It is 30 to 40 feet wide, surfaced with decomposed granite and no culverts less than 24 feet wide. We were now on the prairie again, following along the Front range with Pike's peak in view all the way to Colorado Springs, where we arrived at 1 o'clock, 43 miles from Pueblo. We found all sorts of entertainment awaiting us here as in other places, but much as we would have liked to visit the many sights in the vicinity of this resort, we decided to push on to cover the 93 miles to Buena Vista.

Fine Road Over Ute Pass

Leaving Colorado Springs, the route is almost straight out Colorado avenue to Colorado City and into Manitou, thence up Ute pass, coming very close to Rainbow falls. Colorado Springs is located so close to the Rampart range, which is really a part of the Front range, that the rise begins almost immediately from the city. However, the road conditions are so wonderful over Ute pass that we hardly realized were going to an altitude of over 9,000 feet, which was reached at Divide, 24 miles out. The ascent is almost constant, but there were no grades above 10 per cent. The whole region up to this point is dotted with resorts located along Fountain creek, the more prominent, after leaving Manitou, being Cascade and Green Mountain Falls and Woodland Park.

From Divide the road is a gradual descent of about 1,000 feet into Florissant with a slight rise again to Hartsel in South park. The route after leaving Divide, although not having the magnificent scenery of some others we had been over, was a very picturesque trip and a part of what is known as the Lincoln highway.

Just west of Hartsel we joined in with our route out of Denver over which we came on our second day out, so that it was not necessary for us to go over Trout Creek pass again. After returning to Hartsel, 10 miles, where we arrived at 5 o'clock, we had covered 170 miles and, considering the stops we had made in Florence, Pueblo and Colorado Springs, it shows pretty well the kind of roads we had been over. As we were very anxious to shorten the mileage on Saturday as much as possible, we decided to start back for Cripple Creek, so returned toward Colorado Springs as far as Florissant, which we reached after dark, then left the Colorado Springs road, going directly 19 miles southeast into Cripple Creek. This was the only night driving we did on our whole trip and needless to say we were sorry to miss even this small part. Nevertheless, it was quite a clear moonlight night and we were able to get a fair idea of what a beautiful ride it must be in daylight on a fine road all the way. We were especially sorry to miss the view from the top of the mountain just before coming down into Cripple Creek. Not that we were thinking much of it at that particular time, as there is no real fun driving at an altitude of nearly 10,000 feet

DEAD MAN'S CANYON ON ROAD TO COLORADO SPRINGS

THE SKYLINE DRIVE LOOKING EASTWARD OVER CANON CITY

CONVICT-BUILT ROAD WINDING FROM CANON CITY TO COLORADO SPRINGS
WINDOW ROCK IN PHANTOM CANON, BELOW CRIPPLE CREEK
ROAD IS THOROUGHLY SIGNBOARDED BY COLORADO SPRINGS CLUB
VIEW OF PIKE'S PEAK FROM NEAR DIVIDE

after dark in October. The air was very chilly and sharp and we were all mighty glad to finish our day's run of 226 miles.

Before leaving Canon City, we had made considerable inquiry about the route between there and Cripple Creek, and although we had been told it was a very pretty trip and road conditions were all right, no one had any special praise for it as a scenic route so that we were much surprised. The next morning a little more than a mile out of Cripple Creek we drove into Phantom canyon, which turned out to be one of the most wonderful canyons on our whole trip. We were on a typical gorge road again in a narrow canyon, the rocks above from 600 to 1,000 feet high. The highway is quite narrow and cut into the rocks or ballasted out over the creek a considerable part of the distance, but not more than 20 feet above the creek at any point. The descent is almost constant out of Cripple Creek for nearly 9 miles though there are no sharp pitches. However, it should be driven carefully, as there are many narrow places with sharp turns.

Window Rock in Phantom Canyon

No doubt thousands of people have heard of Window rock, which is passed in Phantom canyon about 5 miles south of Cripple Creek, but no one in our party had been told a thing about it. This is an odd formation of perpendicular rock about 800 feet high, coming straight out from the side of the canyon with a remarkably regular hole through the rock, probably 20 feet square. The road curves sharply right around the foot of this formation, giving a fine view of it coming down and looking backwards. We had our last good view of the Sangre de Cristo range, of which we obtained a glimpse every now and then through the openings far ahead.

About 9 miles south of Cripple Creek and just after the canyon is widened out the road climbs up along the side of the cliff about 600 feet above Four-mile creek and winds along on one of the most remarkable pieces of grade we had been over. Almost every foot of it had been ballasted out with abutments from 5 to 25 feet high. The valley is wide enough so that the vistas from each side are wonderful, although the very location and construction of the road itself proved to us more and more that the people in Colorado did not appreciate what they had to offer the tourist.

About 12.5 miles out of Cripple Creek

it turned right at a little side valley, leaving the main creek for a considerable distance and from here on it is a gradual down grade direct into Canon City. Leaving here at 2 o'clock we headed for Denver by way of Colorado Springs on the last leg of our long-to-be-remembered trip. We had heard everywhere in this section of the wonderful 50 miles of road between Colorado Springs and Canon City, a convict road 26 feet wide practically all the way. We had also expected to see some rather striking scenery, but were quite disappointed, for, although there is no question but what as a boulevard it is a most marvelous piece of road construction, it can nowhere near compare in scenic attractions with others in this section.

Through Dead Man's Gulch

The first part of the route is identical with the Pueblo road to Florence and thence through Penrose directly northeast into Colorado Springs. Some parts of it through Salt canyon and Dead Man's gulch are very winding with sharp turns, but there are no grades to exceed 6 of 7 per cent at any point on the route, and without hard driving at any time we made the 48 miles into Colorado Springs by 4 o'clock.

As we still had 70 miles to cover, we left Colorado Springs at 4:15 with a desire to cover as much of the route as we could before dark. This, like the road from Pueblo, was part of what is known as the Great North-and-South highway, and follows closely along the foot of the Front range. This section of it is much closer to the mountains than at other points. Palmer Lake, 23 miles north of the Springs, being practically in the foothills.

Just before reaching Littleton we came onto good, hard, smooth roads again and the last few miles into Denver were macadam. We pulled up to the hotel at 7:30, making our day's run of about 178 miles, completing probably the most remarkable route and photographic-gathering trip ever gone over by any party. It is one which will long be remembered by every one in the White car, and our one big wish is that next year will see us back in Colorado in some unexplored sections.

(Concluded)

UP UTE PASS 5 MILES OUT OF COLORADO SPRINGS
BEAUTIFUL CLIFF ROAD ALONG FOUR-MILE CREEK
VIEW FROM TOP OF SKYLINE DRIVE NEAR CANON CITY

Enos of Buffalo Chosen A. A. A. Leader

Annual Meeting of National Organization, Held in Chicago, Sees Retirement of Hooper—Assembly Refuses to Consider Ohio Case—Finances in Good Shape, with Money in Treasury—Richmond Chosen for 1913

CHICAGO, Dec. 3—The annual meeting of the American Automobile Association, held for the first time in many years in the west, was an interesting one which was marked by only one fight—the Ohio clash. It also saw the retirement of Robert P. Hooper, of Philadelphia, as president and the installation of Laurens Enos, of Buffalo. The national organization was shown to be in a flourishing condition, with money in the treasury and all bills paid, while the good roads cause was given the expected boost.

The meeting was held yesterday and today and wound up this afternoon with a meeting of the new executive committee. The session yesterday consisted first of a meeting of the old directors at which reports were read. Then came the general meeting of the A. A. A. delegates at which the new officers were chosen, while last night the motorists broke training, so to speak, and enjoyed themselves at the annual banquet of the organization, which was held in the Auditorium, which also housed the annual meeting.

Reports on Finances

The first meeting brought out interesting facts concerning the condition of the American Automobile Association. Treasurer Bonnell explained the expenditure of the $64,000 which came into the A. A. A. treasury during the year and he gladdened the hearts of the delegates by telling them that all bills are paid and that the treasury still has in it the sum of $3,293.07.

William Schimpf, chairman of the contest board, also had pleasant news for the delegates. When he took hold of the office there was a deficit, but so well were affairs handled during the present year that Mr. Schimpf was able to turn over $5,000 to the national treasury, report that all his bills were paid and that there still is a small surplus in his bank. The chairman of the contest board also reported an extra good season. His board has granted 132 sanctions. Twenty more tracks than ever before have been licensed and the number of meets held during 1912 has been a record-breaker. There were ninety-four and this was supposed to have been an off year. In 1911 there were only fifty-two and in 1910 seventy-two. Nineteen of the 1912 dirt track meets were on 1-mile tracks and twenty-two on ½-mile ovals.

So well has the A. A. A. safeguarded drivers and spectators that not one fatality occurred at dirt track meets sanctioned by the national organization. While a few drivers have been injured, none was seriously hurt, while the records show that not a spectator was injured during the year. The contest board took in $13,225 in sanction fees; $1,140 was collected in drivers' licenses; $100 was paid for stock car certificates and $320 was paid over for track licenses. The expenses of the board amounted to $8,170.

Following Mr. Schimpf came Howard Longstreth of the touring board and George C. Diehl of the good roads board, both of whom made interesting reports which told of the great work those two committees have done during the year just ended. Mr. Longstreth told of the popularity of the New York headquarters, how the work of collecting road data for tourists is progressing, and how four transcontinental trails have been blazed. Mr. Diehl of course bubbled over with enthusiasm on good roads. He predicted the success of the federal aid movement.

Chairman Batchelder of the executive committee made a brief report in which he told how the association now has 451 clubs allied with it, 148 more than the A. A. A. had a year ago. There are forty-four active state associations.

The Ohio situation provoked considerable fireworks. The Ohio Automobile Federation desired to be recognized as a state association, whereas the Ohio State Automobile Association already has the franchise. Efforts were made at Atlantic City to gain recognition for the federation and the proposition was passed over to the annual meeting. The Ohio State Automobile Association was opposed to the recognition of the federation but the matter never came to a vote, the meeting refusing to take up the question, following the ruling of President Hooper that it could not come before the assembly.

New Officers Chosen

In the afternoon came the election of officers and the report of the nominating committee was accepted without dissent. This gave the following slate:

President—Laurens Enos, Buffalo.
First vice-president—John A. Wilson, Pennsylvania.
Second vice-president—Dr. H. M. Rowe, Maryland.
Third vice-president—R. W. Smith, Colorado.
Fourth vice-president—F. L. Baker, California.
Fifth vice-president—Asa Paine, Minnesota.
Secretary—J. N. Brooks, Connecticut.
Treasurer—H. A. Bonnell, New Jersey.
Chairman executive committee—A. G. Batchelder, New York.

Two good roads resolutions were put through designed to promote national highways. The association went on record as being opposed to the Shackleford bill, which provides for a system of paying counties for improved highways. A resolution asking congress for funds also was passed. The other good roads resolution was for the establishment of a roads travel bureau under the direction of the secretary of the interior at Washington.

It also was decided to open a branch headquarters in Washington. At first there was some talk of moving the New York office there, with the exception of the touring board and contest board, but it was deemed best to make Washington only a branch.

There was a lively fight for the next annual meeting, participated in by Buffalo, Texas and Virginia. The last named won out and the next session will be held in Richmond.

At the meeting of the new executive committee today President Enos announced the reappointment of the following chairmen: Contest, William Schimpf; good roads, George C. Diehl; touring, Howard Longstreth; legislative, Charles T. Terry.

NEW YORK BOND ISSUE CARRIES

New York, Dec. 2—While the official count has not been completed, it is apparent that the referendum to the people of New York for the $50,000,000 bond issue for completing the system of state good roads has been carried by over 400,000 majority. During the past 3 years the state has expended an appropriation of $50,000,000 on its roads and it was necessary to go before the citizens in order to get a similar sum for the finishing of the work.

That the bond issue should carry by such a tremendous majority indicates the favorable attitude toward good roads all over the state. While the whole motor fraternity favored the issue and worked for it, the project had the support of progressive citizens throughout the state, without reference to car ownership or interest.

The road system under contemplation covers a trunk line system, the details of which have not been announced. It is quite certain that it will include a route through the Mohawk valley and another through the southern tier of counties, linking up the great cities of the central, western and southern parts of the state. The mountain districts and the northern tier will also be provided with magnificent highways. Roughly speaking, the authorized bond issue is sufficient to accomplish the building of about 4,000 miles of first-rate road.

MICHIGAN RECOMMENDATIONS

Lansing, Mich., Dec. 2—In his recommendations to Governor Osborn for new legislation to be incorporated in the executive's message to the legislature, State Highway Commissioner Townsend Ely asks some important changes in the high-

way laws of the state. His most important request is for giving the department authority to maintain roads after they are built. He says many roads built by state and counties under the state reward system of road work are allowed to deteriorate after being completed. He recommends the state pay a small amount per mile for their upkeep, and take charge of the work. State inspectors, he declares, often find reward roads in poor shape but can do nothing.

Commissioner Ely also recommends the roads be made wider. At present the state allows the counties $500 for each mile of road 9 feet in width. Macadam road of the same width brings $1,000 per mile in state reward. He advocates the department be allowed to build the roads up to 11 feet in width and that it be allowed to pay the county $100 per mile for each foot in excess of nine. He believes the 9-foot road is too narrow for main thoroughfares.

He also recommends that car owners be allowed to pay a specific tax and that they be exempted from state license and local tax, and that the proceeds be turned over to the state highway department for its work. He recommends a graduated tax of from $5 to $20 for each machine.

The department spent $235,000 this year. The department already has applications for 600 miles of state reward road and will need at least $400,000 for 1913. Ely says if each car paid $10 it would make up the amount. Motorists now are paying a local tax of $26 and for a state license costing $3, this being applicable to the average $1,000 car.

HOPE FOR DETROIT-TOLEDO ROAD

Detroit, Mich., Dec. 2—Through the new federal law setting aside a fund to be used in the building of post roads, car owners and road enthusiasts of Detroit hope to be able to complete the 60-mile boulevard between this city and Toledo, Ohio, of which 36 miles are unfinished.

Woodbridge N. Ferris, as soon as he assumes the duties of governor, will be petitioned to place the matter of securing a state appropriation before the legislature that government aid in the project may be had. Under the act recently enacted the money is to be granted to the states in the event that the locality in which the road is to be constructed appropriates double the amount.

The governor has been requested to select 50 miles of road in Michigan and secure the appropriation of $20,000 by the state or locality in which the road is to be built, in which event the government will allow $10,000 for the work.

Edward N. Hines, chairman of the Wayne county good roads commission, is enthusiastic over the prospects. He declares that the state easily can appropriate $15,400 required under the federal act to complete the 36 miles necessary to the Toledo-Detroit road. He points out that at the present time Wayne county pays one-fifth the state taxes.

All of the road within Wayne county has been completed and the 3 miles necessary in Ohio also have been finished. The uncompleted section is in Monroe county.

SAVANNAH TO BID FOR RACES

Savannah, Ga., Dec. 2.—Negotiations will be entered into with the Motor Cups Holding Co., of New York, by the Savannah Automobile Club early this month looking to securing the grand prize and Vanderbilt cup races for this city for next fall. The club determined at its last meeting to make a bid for the races, contingent upon the co-operation of the military and the county commissioners and the securing of a representative number of entries for the events.

The announcement that a conference with the officers of the Motor Cups Holding Co. has been arranged is authorized by Harvey Granger, president of the club. President Granger is in receipt of a letter from W. K. Vanderbilt, in which it is stated that the Motor Cups Holding Co. has considered the letter of the local club expressing a desire to secure the races for next year, and that the officers of the company will be ready to meet a committee from Savannah in New York in December to consider the proposition.

The answer of the several military commanders to the request from President Granger that they guard the course next year if the races are held have been made. Practically all of the companies have decided to volunteer their services for patrol duty.

FREIGHT CARS MORE PLENTIFUL

New York, Dec. 2—The freight car shortage has turned the corner and a quick recovery to normal conditions is looked for in the traffic world. The peak of the load was passed about November 18 and the fortnightly tabulation issued by the American Railway Association covering conditions up to November 21 shows that the net shortage for that period was 51,112. As compared with the preceding report, this shows a lessening of the shortage of fifty-seven cars.

As an evidence of the strenuousness of the situation it may be said that at the corresponding period of 1911 there was a net surplus of freight cars amounting to 23,110. The peak of the load, however, was not passed in 1911 until a considerably later date. The box car situation improved to a marked extent.

ANNUAL BANQUET OF AMERICAN AUTOMOBILE ASSOCIATION HELD IN CHICAGO

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LEFT-SIDE STEERING

OF 140 leading makes of American cars on the market for next year approximately forty-seven of them are offering chassis with the steering wheel on the left side and with the brake and change-speed levers either operated by the right or by the left hand.

One year ago it was expected that 1913 would show greater leanings towards the left-side practice, but the developments of the past 8 months have proven that some of the leading makes prefer to keep the steering wheel on the right. Although only 33 per cent of the different makes of cars list the left-side wheel, yet considerably more than this percentage of the total number of cars manufactured will be so fitted, as some of the biggest makers use it.

With the advent of the left-side wheel 4 or 5 years ago it was generally expected that the light cars would be pioneers in this design, and that years would have to pass before the higher-priced machines would fall in line. So far as the announcements for next year are concerned it is apparent that the higher-priced makers are giving the question much consideration, and already new $5,000 models, six-cylinder cars, have been announced with left steering. Some makers of high-powered machines, who are bringing out smaller sizes, are putting the wheel on the left. It is noteworthy that concerns using the left-side wheel during the past are adhering to it in their new models, in fact there are not a few cases where carried-over models with right-hand steering are being converted into left-hand.

It is more and more apparent that left-hand steering is gaining on a sure pace, a pace not spectacular but widespread and certain. The value of left-hand steering in cities is acknowledged by all, and should other states follow the course of Massachusetts in requiring motor cars to pass trolley cars on the left side it will mean that left-hand steering will have to be hurried on by many who are at present holding back, apparently halting between two opinions.

Turning to Kerosene

WITH prices of gasoline rising from month to month, and with country-wide rumors of possible shortage due to the unexpected consumption by commercial motor vehicles greatly in excess of the demand anticipated by the fuel producers, it is not disappointing to hear of carbureter enthusiasts in many states experimenting with embryotic kerosene carbureters and obtaining generally good results. The work is fascinating because kerosene at 8 cents per gallon is more attractive than gasoline at 25, a price charged in some of the metropolitan centers. The attraction is all the greater because of greater mileage that is being obtained, gallon per gallon, than with gasoline.

IT is a fairly long step today from the grade of gasoline that is being offered to the grade of fuel known as kerosene that is purchased at 6 or 8 cents per gallon. Is it best to bridge this gap in one leap or to go slowly, improving the carbureter to meet the gradual increasing of the weight of the gasoline offered? Undoubtedly the latter course is preferable. To the carbureter maker it means alertness personified. He must not build for today; building for tomorrow will not suffice rather, he must sweep his telescopic brain across the vistas of future weeks and months and years, peering into the mists of the future, lifting the veil where possible and at other times fashioning his course according to the events of the present.

IT is not entirely an undeveloped field. The various agricultural competitions of the past summer, in which gasoline-propelled tractors using kerosene fuels have operated with the utmost success, nearly all of them starting on gasoline and switching onto kerosene after the motor has warmed up. The switching from one fuel to another has been so simplified that it is not any more difficult than switching from a battery to a magneto ignition set. The extra gasoline tank is readily incorporated with the main fuel tank and a small quantity of fuel is sufficient for many weeks of starting.

CARBURETERS are at present in use by experimenters in America in which the starting gasoline tank is eliminated and the use of gasoline confined to priming the cylinders. With such carbureters not more than 3 minutes are needed to sufficiently warm the motor so as to permit of traveling. If gasoline has to be used for priming purposes it would seem desirable to use it as a fuel for 3 or 4 minutes after starting so that scarcely any delay, more than that needed with standard gasoline today, would be necessary.

CARBURETER engineers are approaching the kerosene fuel problem from different viewpoints, only some of which have come to the public attention to date. There are several who are experimenting with heat, that is, bringing the temperature of the kerosene up to a certain mark before spraying or mixing it with air, the assumption being that the fuel must be vaporized before mingling with the air, otherwise it is considered difficult to get economic consumption. The heat question is one of easy solution, as the exhaust manifold is a source of almost inexhaustible heat, sufficient at all times to give any desired temperature to the fuel.

WHILE some are experimenting with heat, others are entirely ignoring it and aim to produce a carbureter, which, because of its inherent design, will be capable of handling kerosene in a manner as satisfactory as the carbureter today dispenses the gasoline.

NO matter what may be the carbureter solution, one thing is certain, the carbureter makers, some of them at least, will be equal to any emergency that the fuel situation may demand. With every step in the use of heavier gasoline there has been the general call-to-arms of carbureter brains, with good results, and even if May 1 were to see a general introduction of real kerosene it would find many satisfactory carbureting devices capable of handling it.

Europe Interested in Speedway Race

PARIS, Nov. 23—French drivers and manufacturers have not hidden the fact that they would like to compete for the big prizes offered by the Indianapolis speedway for the 500-mile race to be run on Decoration day. Charles W. Sedwick, who is now in Paris in the interests of the Indianapolis motor speedway, states that every effort is being made by the Peugeot drivers to bring over the full team of three cars which won first place in the French grand prix and the Le Mans race this year, and are recognized as the fastest road racers in Europe.

These cars slightly exceed the piston displacement limit, but can easily be reduced to come within the rules. It is calculated by Georges Boillot, the head of the Peugeot racing team, that his men can put up a good display at Indianapolis and get back to France in time to compete in the grand prix on July 10. The Peugeot race drivers are Georges Boillot, Jules Goux, and M. Zuccarelli.

Albert Guyot, one of the leading French light car racers, has conditionally promised to put in an eight-cylinder car of his own construction. Alfred Koecklin, a two-cycle expert, who figured in this year's French 3-liter race, also is negotiating for the American classic. Among individual drivers who are endeavoring to secure mounts for the 500-mile race are Louis Wagner, Victor Hemery, Arthur Duray, and Victor Rigal, all of them recognized as the best talent Europe can produce.

Mr. Sedwick is of the opinion that before he sails for New York he will have arranged for some of the best European cars and drivers to appear before the American public on May 30.

BRAGG'S CASE SETTLED

Milwaukee, Wis.—To settle the long-drawn out controversy between the Milwaukee Automobile Dealers' Association, promoter of the 1912 Vanderbilt cup, grand prix and other road races at Milwaukee, and Caleb S. Bragg, winner of the 1912 grand prix, a controversy which has stirred up much feeling and tended to make the disappointment of the financial end of the road races much more difficult, the M. A. D. A. has authorized the following statement over the signature of Emil Estberg, vice-president:

The dealers' association wishes the public to know the facts in relation to its dispute with Caleb Bragg, arising over the association's demand for the payment of his entry fee as a driver in the race. It has been discovered that Bragg, in no event, agreed to pay more than $500 as his entry fee. Upon the race being necessarily postponed, Mr. Wagner, the starter, told Bragg that if he would remain in Milwaukee and drive, his entry fee would be waived. At a later meeting the association volunteered to pay Bragg's expenses while remaining here, which, as it now appears, was intended to offset the waiving of the entry fee. Both sides have now agreed that the fair way to settle all differences, in view of all the conditions, is to permit Bragg to pay his original entry fee and deduct therefrom his expenses, as agreed, which has been done to the mutual satisfaction of everybody.

C. W. Sedwick Lining Up Foreign Drivers for the Indianapolis Meet

Statements contrary to or in addition to the foregoing are not in accord with the facts as they are found upon a complete investigation of them.

Any statement or statements made public reflecting upon Bragg's observance of the rules of the sport of motor car driving do not express the opinion of the association. We know of no reason for making them.

The finance committee of the M. A. D. A. is making excellent progress in raising funds to liquidate the aggregate indebtedness of about $43,000 caused by the race meet. Creditors have been lenient in the matter and the let-up of pressure of demands has made the work of financing the big deficit much lighter.

RICHMOND MEET RESULTS

Richmond, Va., Nov. 30—The raising of the outlaw ban on the mile circular dirt track of the Virginia state fair grounds, where today and yesterday, under the sanction of the American Automobile Association the Richmond Automobile Club conducted a professional meet and the lowering of the track record on the 2 successive days by Louis Disbrow, driving Simplex Zip were features of Richmond's meet.

Louis Disbrow, in his Jay-Eye-See, made an effort on Friday at Barney Oldfield's record of 1:03⅕, made on the local track 3 years ago, and failed, covering the distance in 1:09½. On Saturday Disbrow with Jay-Eye-See made the mile in 1 minute flat, and on Friday in the 10-mile handicap, with the Simplex Zip, he made the final mile in 1:01. Summary:

FRIDAY

Five miles—Minker, Klinekar, won; Morton, Klinekar, second; Allport, Stevens-Duryea, third. Time, 1:29.

Exhibition drive—Disbrow, Simplex. Time, 1:09½.

Ten miles for cars under $1,600—Taylor, Buick, won; Koehler, Ford, second; Booth, Maxwell, third. Time, 14.20½.

Three-heat race—Disbrow, Simplex, won.

Five miles—Nikrent, Case, won; Barber, Warren, second. Time, 6:33½.

Ten-mile non-stock handicap—Disbrow, Simplex, won; Morton, Klinekar, second; Minker, Klinekar, third. Time, 11:03.

SATURDAY

Five miles—Minker, Klinekar, won; Morton, Klinekar, second; Allport, Stevens-Duryea, third. Time, 6.17½.

Ten miles, non-stock, 231-300 class—Wisbart, Mercer, won; Nikrent, Case, second. Time, 10:43½.

Trial for track record—Disbrow, Simplex. Time, 1:00.

Five miles—Taylor, Buick, won; Kohler, Ford, second. Time, 7:13¾.

Ten-mile, non-stock handicap, 231-450 class—Nikrent, Case, won; Morton, Klinekar, second; Lewis, Stutz, third. Time, 10:59¾.

Five miles, non-stock, handicap, 45-600 class—Disbrow, Simplex, won; Lewis, Stutz, second; Nikrent, Case, third. Time, 5:16½.

Five miles—Disbrow, Simplex, won; Lewis, Stutz, second; Morton, Klinecar, third. Time, 5:21¾.

Twenty-five miles, non-stock, free-for-all—Disbrow, Simplex, won; Nikrent, Case, second; Morton, Klinekar, third. Time, 26:40.

Coming Motor Events

SHOWS

December 7-22—Paris salon.
December 16-21—Show at Seattle, Wash.
January 2-10—Importers' Salon, Hotel Astor, New York.
January 4-11—Cleveland.
January 4-11—Montreal.
January 11-18—New York pleasure car show; Automobile Board of Trade; Madison Square Garden and Grand Central Palace.
January 11-18—Milwaukee, Wis.
January 11-22—Brussels, Belgium.
January 20-25—New York truck show; Automobile Board of Trade; Grand Central Palace and Madison Square Garden.
January 20-25—Philadelphia.
January 21-26—Toledo Show.
January 25-February 1—St. Johns, N. B.
January 25-February 1—Show at Providence, R. I.
January 25-February 1—Montreal, Canada.
January 27-February 1—Ottawa, Ont.
January 27-February 1—Scranton, Pa.
January 27-February 1—Detroit.
January 27-February 1—Pleasure Show, Buffalo, N. Y.
February 1-8—Chicago pleasure car show; National Association Automobile Manufacturers.
February 3-8—Show, Washington, D. C.
February 10-15—Chicago truck show.
February 10-15—Minneapolis.
February 12-15—Geneva, N. Y.
February 15-22—Newark, N. J.
February 15-22—Albany, N. Y.
February 16-23—Richmond, Va.
February 17-22—Kansas City.
February 20-22—Canandaigua, N. Y.
February 24-March 1—St. Louis, Mo.
February 24-March 1—Memphis, Tenn.
February 24-March 1—Cincinnati, O.
February 24-March 1—Omaha, Neb.
February 26-March 1—Fort Dodge, Ia.
February 26-March 1—Glen Falls, N. Y.
March 1-8—Pittsburgh.
March 8-15—Boston pleasure car show.
March 12-15—Ogdensburg, N. Y.
March 18-22—Syracuse, N. Y.
March 18-22—Truck show, Buffalo, N. Y.
March 19-26—Boston truck show.
March 20-24—New Orleans, La.
March 24-29—Indianapolis.

TOLEDO TO MOTORIZE

Toledo, O., Nov. 30—The council this week passed a resolution authorizing legislation for a $200,000 bond issue to equip the fire department with motor-drive apparatus. Safety Director Mooney who recently appeared before the finance committee pleading for the substitution of the motor-driven apparatus for horse-drawn vehicles declares that the saving of horses and their keep alone will pay the interest and retire the bonds. He declared that the upkeep of the apparatus will not be greater and the saving in natural gas now used to keep water heated in the steamers will more than pay the gasoline bills. Mooney stated that it cost but $450 for the fire chief's car in 3 years, during which time it has traveled 42,000 miles and is still in good shape.

DEATH OF OMAHA DEALER

Omaha, Neb., Dec. 2—James J. Deright, president of the Deright Automobile Co., of Omaha, one of the most prominent and well known dealers in the middle west, was instantly killed in his private room at the company's building Thanksgiving morning. The entire right side of his head was blown off by the apparent explosion of two shells in a double-barreled shotgun.

Makers Tell of 1913 Contest Plans

Motor Age Asks Members of the Industry What They Intend Doing Next Season—Replies Encouraging—Lozier May Race Light Six—Stutz, Mason, Ames, G. J. C., Staver and Speedwell Promise Support in Speed Battles

CHICAGO, Dec. 2.—Racing prospects for 1913 have brightened within the last week. The Savannah Automobile Club has decided to re-enter the promotion field and it is understood it will ask for both the Vanderbilt and the grand prix; Milwaukee also would like the same two classics; New York dealers have organized with the announced intention of trying to return to the east the Vanderbilt cup event, while now the positive declaration is made that the Elgin road races will be put on in the fall of 1913. The meet will take place the latter part of August as usual and it will be marked by the adoption of the 450-inch limit, an idea originated by Indianapolis and intended to encourage the competition of American manufacturers by eliminating the specially-built big racers.

Elgin Meet Certain

The 1913 plans were discussed last Tuesday night when the Elginites gave a dinner to the members of the contest committee of the Chicago Automobile Club. It was agreed that the partnership be continued and the prospects were declared to be rosy. An innovation decided upon was to have only one race each day instead of two or three as has been customary. The first day will be given over to a non-stock race for cars 300 cubic inches and under, while the second day the one event will be for cars 450 cubic inches and under. The promoters have decided to make the distance in both races the same—about 300 miles—in order that comparisons may be drawn as to the relative speed abilities of the two classes. Heretofore it has been customary to hold the small cars down to short distances.

Private owners are to be encouraged to enter and with this idea in mind there will be a special trophy offered. E. C. Patterson, who tried hard to import the Peugeot team last summer, has pledged himself to make an entry. It is thought he has in mind trying for an English Sunbeam.

The meet will mark the re-entry into competition of a famous trophy which has been on the shelf since 1910—the Cobe cup. Ira M. Cobe, president of the Chicago Automobile Club, has agreed to turn the trophy over for the Elgin meet, provided the name is changed. Therefore, it is to be called the Chicago Automobile Club cup and it probably will be offered in the first day's race. It is hoped to have the Elgin National for the second day, provided an agreement can be made with the Chicago Motor Club, which holds the deed of gift.

What of 1913?

Naturally these announcements give rise to the one main question: Will the American manufacturers give promoters more assistance than they did this year or will these promoters have to rely upon foreign cars for their attractions in racing events and entries from agents and private owners for the reliabilities and hill-climbs? This is the question of the hour with those who look to the sporting side of motoring for enthusiasm and they await the verdict of the American industry.

It must be confessed that the season of 1912 was an off year. American makers as a whole held aloof and promoters had a sorry time of it. There was no Glidden tour, there were few reliabilities and fewer hill-climbs. Racing had a hard time of it and not more than a half-dozen con-

Excerpts from Letters Received by Motor Age from the American Motor Car

MOTOR AGE has undertaken to secure a line on the 1913 contest season by asking the various car manufacturers to outline their plans for the coming season.

Some of the replies received are interesting, showing that the manufacturers are studying the proposition. While several state positively they will not support contests, yet they say they look with favor on the sport and are not averse to their agents participating. Here are excerpts from letters received by Motor Age:

Lozier Motor Co.—The Lozier company has withdrawn from racing and probably will take no active interests in contests next season. We have received great benefit from our participation in endurance contests during the past 5 years, not only as regards advertising and publicity, but through the valuable results obtained by the engineering department. We are placing on the market a new model light six and it is possible this car may be entered in some of the big national events to which it is eligible simply for the purpose of demonstrating its speed and endurance and to see if the engineering department can gain any benefits from such tests.—C. A. Emise, sales manager.

Hudson Motor Car Co.—We have at this date made no decision as to a contest campaign next year. Broadly speaking, we favor endurance and touring competitions, speedway and road racing. We are not in favor of racing on mile dirt tracks. In general we realize thoroughly the important part which contests of all kinds have played in the development both of the engineering and selling ends of the business. We have little patience with the complacent attitude of some of those who have expressed themselves in print to the effect that the motor car now is a perfect mechanism, hence no longer requiring the influence of contests as a spur and guide to progress. Just so long as yearly models are produced and just so long as radical changes of any kind are made in motor car construction from season to season, just that long are mistakes sure to be made in matters of design and construction. Greater and greater speed capacities have been demanded by the purchaser during the past 2 or 3 years. It is practically impossible for any manufacturer to test his cars upon the road under the condition of maximum speed of which they are capable in the hands of the user. It has been our experience that the entering of a new model in a 200 or 300-mile road race has taught us more as to weak points in a day than have months of ordinary driving on the road. This condition has held during past years and we cannot see why this same condition will not be applicable to future years. It is possible but debatable, that contests may not now play so important a part in the merchandizing end of the business. We do believe that they play just as important a part as they ever did in the engineering and designing ends.—H. E. Coffin, vice-president.

Palmer & Singer Mfg. Co.—We are firmly of the opinion that racing by a manufacturer is one of the best means of introducing his product but it is absolutely necessary to follow it up with extensive advertising if one wishes to derive all the benefits. With new cars or factories having tremendous outputs we should say racing is absolutely essential; in our case however, it is entirely unnecessary. With our limited output we find no difficulty in disposing of the number of cars we build. Were we in a different position we undoubtedly would heartily support speed contests as well as endurance runs, for they undoubtedly stimulate interest in the minds of at least 75 per cent of the buying public.—Charles A. Singer, Jr., vice-president.

National Motor Vehicle Co.—We as manufacturers retired from racing for an indefinite period, after Memorial day, 1912, and we have made no plans whatsoever for the future and do not anticipate taking part in any events during the season of 1913. However, were we still interested in racing we would prefer road racing and speedway racing and would not under any consideration consider racing on dirt tracks.—George M. Dickson, manager.

J. I. Case Threshing Machine Co.—We are not in shape at this time to give any definite information as to contests. We will say, however, that we favor speedway and dirt track racing. We will give our usual support to reliability runs, although there is some question about hill-climbs.—M. C. Meigs, advertising manager.

Ames Motor Co.—We have just finished a racing car and it is our intention to support road and dirt track racing.—G. W. Yeoman, vice-president and general manager.

G. J. C. Motor Co.—We will support racing next year. We will put out two cars which will be driven by Paul Thebaud and Thomas Costello.

Mason Motor Car Co.—We will as manufacturers support racing next year. We expect to participate in the national events and will make such support as is necessary to agents. We now expect to enter at Indianapolis and will put in as many cars in the 500-mile race as we are permitted to nominate.—E. R. Mason, president.

Henderson Motor Car Co.—This factory will not personally enter or support racing but there is a possibility we might enter a few reliability runs or hill-climbs.—W. D. Edenburn, manager newspaper department.

United States Motor Co.—We have no very definite plans yet for our contest program for next year, but in a general way our disposition is to support reliability runs. None of the companies in the United States Motor Co. will support dirt track racing next year nor will they participate in road events. But we cannot but feel that some benefit

Elgin Road Races for Next Year Certain

Chicago Automobile Club Will Again Manage Meet—Only One Event to be Run Each Day—First Contest for Cars 300 Inches and Under While Second Has 450-Inch Limit—Distances of the Two Classes the Same

cerns held out a helping hand. Dirt track racing, like a lily in a stagnant pond, flourished because of the activity of three racing combinations which swung through the country, promoting meets and raking in the shekels. While there were road racing meets at Santa Monica, Tacoma, Elgin and Milwaukee, none scored a financial success, although the sport itself was keen and the races themselves proved the public has not lost its interest in this form of sport.

There were no fatalities on road or track in actual contests, although death claimed David Bruce-Brown and Mechanic Scudaleri in the practice at Milwaukee. No other sport into which the element of danger enters can show such a clean bill of health for 1912.

Outlook for Next Year

For 1913 it would seem right now as if the prospects are brightening to a considerable extent. Agitation has been started to interest the makers, the appeal being based on the publicity standpoint, so it is thought help will be had from unexpected quarters. Of course it is rather early to expect declarations from many as to their plans for next year. Many are holding back waiting for others to announce themselves, but it would seem as if promoters can look for more assistance than they had this year.

For the purpose of getting a line on the outlook, Motor Age wrote many of the leading car makers of this country as to the stand they propose to take in the matter of contests. Fifty-seven replies were received and while few of them were positive in their statements, still the general tenor of the letters was such as to encourage promoters in general, provided they read between the lines.

Some of the Gossip

It has been gossiped around that the rejuvenated United Motors intends to support contests liberally; that Hudson and Chalmers will race again and that several other big concerns are ready to come into the game, but the Motor Age probe failed to produce any definite results. It did find out, though, that there are many makers who are giving the question careful thought and it would not be surprising if at show time several converts were announced. It is known that Stutz, Mercer and Mason will continue in the sport; Studebaker undoubtedly will be in, although its plans have not been completed; Hudson is reported to be thinking it over; Lozier would like to see what its little six can do; National is uncertain; Marmon is thinking it over, while recruits are announced in the shape of the Ames and G. J. C. Motor Co., of White Plains, N. Y. The Speedwell and Staver also will race, it is expected.

As for the annual A. A. A. reliability, it looks as if that famous event would be restored to its old prestige next year. It is to be held in June and the American Automobile Association will make every effort to secure a record-breaking entry list.

A Chicago-Boston Reliability

Then, too, there is a prospect of a reliability from Chicago to Boston via New York, which will be remarkable because the cars will be required to run night and day continuously and with the motors running at all times. Drivers and observers will be changed each night and morning. All details have not been completed, though.

Manufacturers in Reply to Queries as to Contest Plans for the Season of 1913

accrues from contests on good speedways like Indianapolis and Atlanta. We are in favor of and expect to support reliability runs but not hill-climbs in 1913. We rather prefer stock car contests with the usual technical examination. Our racing plans will not be decided until after January 1.—Alfred Reeves, general sales manager.

Ford Motor Co.—We hardly believe the Ford company will take part in any contests of any sort during the ensuing year. We are not building racing cars and are not in favor of supporting contests of this sort, consequently we have made no plans either in the way of building special machines or arranging to take any part in racing contests.—N. A. Hawkins, commercial manager.

Matheson Automobile Co.—We will not support racing directly, but if occasion warrants it we will give assistance or support to responsible, legitimate agents who have made good.—W. C. Shepard, president and general manager.

Mitchell-Lewis Motor Co.—We are not contemplating the taking up of either road or track racing, but there is no doubt but what some of our representatives will do something in this line.—O. C. Friend, sales department.

Edwards Motor Car Co.—We have not fully formulated our plans but it is our impression that we will support reliability runs and hill-climbing contests in 1913.—F. B. Ludwig, sales and advertising manager.

Pierce-Arrow Motor Car Co.—We are not interested in contests and do not intend to support them. However, if we were called upon to express a preference we would declare in favor of stock car contests. When we say stock car contests, we mean stock car in every sense of the word. The only stock car contest that might interest us would be one where the cars were taken directly from stock and put back in stock after the event.—C. L. Hodge.

Empire Automobile Co.—Although this company will not indulge in any sort of racing, it is very probable that we will enter in the Pacific coast tour of the Indiana manufacturers and we also will be in other non-contest events.—Harlow Hyde, advertising manager.

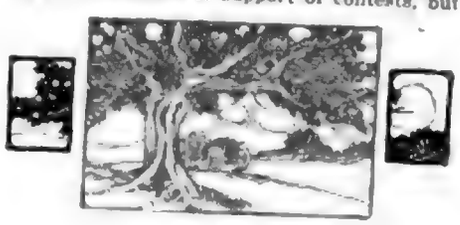
Simplex Automobile Co.—We do not contemplate racing next year but we will continue to have our special track car driven by Louis Disbrow.—C. A. Brosiel, manager.

Inter-State Automobile Co.—We have discontinued racing, temporarily at least. We take an interest in the sport but cannot state positively as to when we will participate in any event.—C. P. Brockway, factory manager.

Cameron Mfg. Co.—It is our intention to support racing next season. We have no preference as to the style of the contest if the weight of the car and the piston displacement are held to reasonable safe limits. We are very much in favor of hill-climbs and fuel economy contests, believing they are the best tests of all-round efficiency of a car. We favor stock cars for hill-climbs and fuel tests and non-stock for speed events.

Cole Motor Car Co.—The Cole Motor Car Co. believes in every enterprise which displays the use and merit of the motor car. It believes in racing, in hill-climbs, reliability runs and all contests whether national or local. On these occasions when the Cole Motor Car Co. has not been able to participate, it has been glad that there were others at hand to help stir up the interest of the public in the motor car industry. This is the feeling of the Cole company. It is a little early to pin ourselves down to anything that we shall do specifically, for it is the policy of the company to decide on each specific event as it comes up rather than make a general statement as to what contests it will support.—Carl Bernhardt, assistant advertising director.

Buick Motor Co.—We have made good in the game and we can see nothing to gain by a continuance of support of contests, but we really feel that events of any public nature are, in a measure, the backbone of the motor industry. However, while we as manufacturers give contests our loyal moral support, we are not in them for ourselves, nor have we any desire to be. As to reliability runs, etc., our dealers all over the country are always pulling them off and we are mighty glad to see them do it.—Charles H. Woodruff, director of publicity.



Columbus Buggy Co.—We do not intend to make any plans toward participating in any of the racing events next year, although we may build a few cars for racing and furnish these to our dealers if they request them.—W. C. Leslie.

Moline Automobile Co.—We positively are not interested in racing events of any character whatsoever. The only class of contest in which we are interested is the reliability which is run under grade 1 rules, which call for stock cars and a technical examination.—W. H. Van Dervoort, president.

Letters were received from the following firms which declare positively they will not support contests in 1913: Knox Automobile Co., Cadillac Motor Car Co., White Co., Willys-Overland Co., Packard Motor Car Co., Olds Motor Works, Franklin Automobile Co., Dorris Motor Car Co., Haynes Automobile Co., Norwalk Motor Car Co., Zimmerman Mfg. Co., Westcott Motor Car Co., Dispatch Motor Car Co., Auburn Automobile Co., Great Western Automobile Co., Peninsular Motor Co., George W. Davis Carriage Co., Bartholomew Co., Anger Engineering Co., Wayne Works, W. H. McIntyre Co., Regal Motor Car Co., Chevrolet Motor Co., Apperson Brothers Automobile Co., Abbott Motor Co. and R. M. Owen & Co.

Massachusetts Judges Hold Motorist

Decision of Supreme Court Clashes with Bay State Rules of the Road

BOSTON, Mass., Nov. 27—The supreme court of Massachusetts presented to the 40,000 or more motorists in the Bay state yesterday a Thanksgiving decision for which they will not be very joyful, when it was decided, four judges to three, that a motorist passing a street car on the right was not obeying the law of the road, and therefore was liable for damages for injuries to anyone he may hit, regardless of other circumstances.

Judges Braley, Sheldon, Morton and De Courcey backed up the decision, while Chief Justice Rugg and Judges Hammond and Loring wrote a dissenting opinion. However, as the majority rule settles the matter, it means that motorists throughout the Bay state, and particularly while driving in cities—and also drivers of other vehicles—will find themselves in a fine pickle from now on until the legislature grants them relief. If they do not follow the law of the road and drive to the left when overtaking any vehicle, electric cars included, they will be disobeying the law. The various cities of Massachusetts which have traffic regulations requiring all vehicles to keep to the right, and to pass electric cars on the right, can now throw their regulations into the waste basket, for they are not worth the paper on which they were written. Meanwhile, when motorists obey the law and follow the rule of the road they may find themselves running the risk of head-on collisions with vehicles coming the other way. Otherwise they must stick to the beaten path of travel and not go faster than the electric cars.

Already Boston is in the throes of bewilderment over it. The Boston street commissioners point to an act of the legislature giving them power to make traffic regulations in the city, and under their ruling vehicles must keep to the right, regardless of the state law. Now these commissioners intend to stand pat on the matter and the police commissioner, Stephen O'Meara, says that he will follow the ruling laid down by the commission.

On the other hand some attorneys say that the act conferring on the Boston

Majority Opinion of the Bay State Supreme Court

THE scene of the accident was a public way in the centre of which the double tracks of a street railway were so located as to leave an equal space between the outer rails and the opposite curb. The plaintiff had just alighted from the right hand side of an open electric car, and while in the act of stepping forward to cross the street to the curb in front, the defendant's motor car, which had been following in the rear, turned to the right to pass the car and in passing struck and injured him. If the defendant had gone by on the left the plaintiff would not have been injured, and in submitting to the jury the question of the defendant's negligence the presiding judge was requested by the plaintiff to rule that "the fact that the defendant was disobeying the law of the road will justify the jury in finding for the plaintiff, if the plaintiff was in the exercise of due care." Damon v. Scituate, 119 Mass. 66, 69. Finnegan v. Winslow Skate Mfg. Co. 189 Mass. 580, 582.

The verdict having been for the defendant, the exceptions are to the refusal to give this request, and to the instructions that the defendant's conduct "was not a violation of the 'law of the road,' and was not of itself negligence." A majority of the court are of opinion that the request was appropriate, and that the instructions were erroneous. By R. L. c. 54, s. 2, "the driver of a carriage or other vehicle passing a carriage or other vehicle travelling in the same direction shall drive to the left of the middle of the travelled part of a bridge or way; and if it is of sufficient width for the two vehicles to pass, the driver of the leading one shall not wilfully obstruct the other."

It has been decided that in the concurrent use of our public ways a motor car is to be classed as a vehicle. Hennessey v. Taylor, 189 Mass. 563. Trombley v. Stevens-Duryea Co. 206 Mass. 516. Lynch v. Fisk Rubber Co. 209 Mass. 16. Bourne v. Whitman, 209 Mass. 155. But the defendant contends that an electric street car should not thus be defined, and if it is not a vehicle as an object of travel, his liability at common law depended upon whether he acted with reasonable prudence in passing upon the right instead of on the left, and the jury correctly settled this issue in his favor. Smith v. Conway, 121 Mass. 216, 219.

It was assumed in Clinton v. Revere, 193 Mass. 151, 154, where the plaintiff riding a bicycle and following an electric car and furniture wagon moving abreast, turned to the right to pass between the car and the wagon and was injured by a defect in the way, that his failure "to observe the requirements of R. L. c. 54, s. 2, by turning and passing by to the left of the car," was not decisive, as the jury were to determine whether he acted with ordinary care.

And in McGourty v. De Marco, 200 Mass. 57, 60, where the plaintiff in alighting from a street car was run into from behind by a team owned by the defendant and driven by his son, it was said: "If the defendant was, as his counsel assumed in their brief, and as the jury certainly might find, attempting to pass the car from behind on his right hand in violation of R. L. c. 54, s. 2, the jury might find that this, under the circumstances, was negligence on the driver's part such as McGourty was not called upon to anticipate." See also Keeney v. Springfield St. Ry., 210 Mass. 44, 48. A further examination of the statute in the light of our decisions confirms this construction. The relative rights of the general public to use the highway through which a street railway runs were defined some fifty years ago by Chief Justice Shaw in Com. v. Temple, 14 Gray, 69, 75, as being equal, "in the absence of any special regulation by law."

In constructing the statute of 1856, c. 302, s. 5, which made the wilful and malicious obstruction of the use of the track of the street railway of the company incorporated by the statute a criminal offence, he further says, in considering the exceptions of the defendant who had been convicted of a violation of the act by obstructing a horse car when travelling over the street with a heavily loaded team: "The defendant's team was moving at the usual rate for teams of that class, but at a less rate of speed than the cars were in the habit of moving. There was room outside the track for either vehicle to pass the other. When the car came up, the conductor asked the defendant if he would remove his team from the track; he did not, but continued upon it, at the same rate of speed, several hundred feet, and then turned off. Several things are here to be observed. The cars could only pass on one precise line. The wagon could deviate to the right or to the left, within the limits of the travelled part of the road. The public, by the grant of the franchise, had granted the right to move on that precise line, and had given to all passengers the right to be carried on that line at the usual rate of speed at which passengers are carried by horses, subject only to occasional necessary impediments. The cars cannot so move, and the passengers cannot be so carried, whilst the wagon moves on the track. No impediment is shown to prevent the wagon from turning out. The wagon therefore was for the time being an unnecessary obstruction of the public travel, and therefore unlawful."

While the motive power has been changed, no departure has been made from the principles of this decision, which have been affirmed whenever in the concurrent use of our public ways by other travellers and street cars it has been necessary to refer to their respective rights. Driscoll v. West End Street Railway, 159 Mass. 142, 156. Benjamin v. Holyoke Street Railway, 160 Mass. 3, 5. O'Brien v. Blue Hill Street Ry., 186 Mass. 446, 447. Kerr v. Boston Elevated Railway, 188 Mass. 434, 435, 436. Callahan v. Boston Elevated Railway, 205 Mass. 422, 423.

A vehicle is a means of conveyance, and the term has not been restricted to horse drawn carriages, but includes bicycles, motor cycles, motor cars, or a street car, which since the leading case is assumed to be a vehicle having no paramount right, when being operated, to inconvenience other travellers except in so far as the legislature has granted an exception to street railway companies.

Said Holmes, J. in White v. Worcester Cons. Street Railway, 167 Mass. 43, 44, 45, "Their tracks are in the highway, where all vehicles have a right, not simply to cross, but to travel. In view of the inability of the cars to leave their tracks, it is the duty of free vehicles not too obstruct them unnecessarily, and to turn to one side when they meet them, but subject to that and to the respective powers of the two, a car and a wagon owe reciprocal duties to use reasonable care on each side to avoid a collision."

See Galbraith v. West End Street Railway, 165 Mass. 572, 580. "Neither has a right to assume that the other will keep out of the way at its peril, although the electric car has a right to demand that the wagon shall not obstruct it by unreasonable delay upon the track." O'Brien v. Blue Hill Street Railway, 186 Mass. 446. Williamson v. Worcester Cons. Street Railway, 191 Mass. 144. Stubbs v. Boston & Northern Street Railway, 193 Mass. 518. Chaput v. Haverhill, Georgetown & Danvers Street Railway, 194 Mass. 218. Jeddrey v. Boston and Northern Street Railway 199 Mass. 232. Lockwood v. Boston Elevated Railway, 200 Mass. 537. Eldredge v. Boston Elevated Railway, 203 Mass. 582. O'Brien v. Lexington and Boston Street Railway, 205 Mass. 182. Hatch v. Boston and Northern Street Railway, 205 Mass. 510. Carroll v. Boston Elevated Railway, 206 Mass. 519, 520. Eustis v. Boston Elevated Railway, 205 Mass. 143.

See also Burton v. Nicholson, 1909 1 K. B. 397, where the court held that the driver of a carriage overtaking a tram car must observe the law of the road. The right of the plaintiff as a pedestrian to free and unobstructed passage also has not been abridged by modern conditions of travel. "There is no law or principle of law, or of reason, which confines foot-passengers to particular crossings. Such a restriction would be very inconvenient and annoying. The street should be kept in such condition, that foot-passengers may be able to cross, with a reasonable degree of safety, using proper care themselves, at any and all places.

The necessity of this might be illustrated very fully by reference to the common and ordinary course of business. A person, who is left by an omnibus in the middle of the street, should be able to go in safety to the sidewalk at the nearest point, and not be compelled to make his way among the carriages in the middle of the street, until he can reach a place particularly set apart and designated for the purpose of crossing." Fletcher, J. in Raymond v. Lowell, 6 Cush. 530, 531. Slayton v. West End Street Railway, 174 Mass. 55. Eustis v. Boston Elevated Railway, 206 Mass. 143, 144. Mullen v. Boston Elevated Railway, 209 Mass. 79, 80, and cases cited. Berry v. Newton and Boston Street Railway, 209 Mass. 100.

The statute in question has not provided merely for the protection of travellers in vehicles: pedestrians also are entitled to rely upon the presumption that it will be observed. Brown v. Thayer, 212 Mass. 392. It should receive a construction not only in harmony with what has been declared to be the reciprocal rights and duties of travellers as defined by the authorities cited, but which will not create an exception where none is necessary to effectuate the legislative intention. The law of the road first appears in the statutes of 1820, c. 65. It was not, however, until the general statutes, c. 77, that s. 2, now R. L. c. 54, s. 2, was enacted, and s. 5, that "the provisions of this chapter shall not apply to horse railroads" was also added. Re-enactment followed in the public statutes, c. 93. In the last revision s. 5 is omitted.

The reason given by the commissioners is that it is superfluous, as "the history and subject matter of this chapter show that it has no application to railways, whether operated by animal power or electricity." Commissioners' report on public statutes Part I, p. 491.

If the acceptance and adoption of the report without change is decisive, that no express repeal of the existing law was intended yet the legislature must be understood to have acted under the well recognized rule that if a statute which previously has received judicial construction is codified with the purpose of not making any substantial change in the law, it will be presumed that the intention was to adopt the construction given by this court even if there may be changes in phraseology. R. L. c. 226, s. 2. Com. v. Lancaster Mills, 212 Mass. 315. Paszkowski v. Stone Brook Paper Co. 210 Mass. 86. Wright v. Dresser, 140 Mass. 147, 149. Bent v. Hubbardston, 139 Mass. 99, 100. Shelton v. Sears, 147 Mass. 453. If therefore s. 5 of c. 93 of the public statutes being merely declaratory of the law of the road as defined by this court, is to be treated as still in force, how far does it affect the preceding sections of the R. L. c. 54?

The first two sections are commands addressed to the drivers of carriages and other vehicles on a road or bridge. By s. 1 every

Cannot Pass Street Car on the Right

Attempt to Be Made to Have Legislature Change the Measure

street commission the right to make traffic laws does not abrogate the state law of the road because it does not state so specifically. Therefore, any motorist who gets into trouble may find that the decision of the supreme court will not exempt him because it happens in Boston, for if this were so the court would refer to the regulations in its decision.

Boston is referred to as an example in the opinion handed down, which seems to preclude that it should enjoy any special favors. Even if the traffic regulations in Boston overrule the state law that will not be of any help to Worcester, Springfield, Fall River or any one of the other thirty-odd cities of the state, not to mention the countless large-sized towns where electric cars occupy the main-traveled roads. So the motorists wonder where they are at in Boston, whether to take the street commissioners' view and depend upon not getting into trouble, or take the court view of the case. The insurance companies will take the matter up now because they have to pay the damages in most of the accident cases.

This whole matter came about through a motor accident in which Thomas P. Curtis, a wealthy motorist, figured some time ago. He was proceeding through Revere when J. Sidney Foster stepped off a street car on the right. According to Curtis, Foster swung wide, and although there was 5 or 6 feet between the electric car and his motor car Foster bumped into the mud guard and wheel. Curtis was driving slowly, not more than 5 miles an hour, and he blew his horn.

When the case for damages was tried Foster's attorneys asked Judge Harris, who presided, to instruct the jury that the fact that Curtis was disobeying the law of the road would justify the jury in finding for Foster if the latter was in the exercise of due care. Judge Harris refused to do so, and in his charge to the jury he said that the ordinary rule of the road does not apply to street cars, because they cannot go to the right or left, but must keep straight on or back up along the rails. He also stated that such driver is required to drive his vehicle reasonably "to the right of the middle of the travelled part of such bridge or way," and by s. 2, if passing a vehicle going in the same direction, he is required "to drive to the left of the middle of the travelled part." Where vehicles are moving in the same direction over a roadway sufficiently wide for them to pass abreast, the statute is silent as to any duty of the vehicle ahead, except that "the driver of the leading team shall not wilfully obstruct the other." The comprehensive words of these sections should be given their ordinary and natural significance. R. L. c. 8, s. 4, cl. 8.

Although street cars are vehicles within the meaning of the statute, their drivers are relieved from the requirement of turning to either side of the middle of the travelled part of the road. The reason is obvious. The cars need not turn, because they cannot diverge from the tracks on which they run. Persons lawfully using a public way have a right to presume that drivers of free teams and vehicles will act in conformity with these directions, and if a driver neglects to obey them, and injury results, this is a circumstance which the jury may consider in determining whether he was careless, and unless explained it is indicative of his negligence. Besides, if the exemption applicable to street cars were held to include the defendant, the practical results would be serious. Street railways are not chartered and granted locations in our public ways for the benefit of the promoters or owners. "The accommodation of travelers, of all who have occasion to use them, at certain rates of fare, is the leading object and public benefit, for which these special modes of using the highways are granted, and not the profit of the proprietors."

It is common knowledge that passengers generally leave street cars from the right hand side, whether the cars run on single or double tracks, which in cities and large villages usually are located in the center of thoroughfares where travel is most frequent. And if the drivers of other vehicles are required to observe a street car as being within the law of the road, passengers in alighting will be freed from the needless hazard of personal injuries from the undue proximity of vehicles passing in either direction.

The not infrequent condition requiring a prudent driver, if the tracks are double, to ascertain whether a car is approaching on the parallel track before turning his vehicle upon it, is but incidental to ordinary travel in streets in which cars are being operated. If an oncoming team were moving over the same area, he would be required to use similar precautions to avoid a collision, or even if necessary, to wait for it to pass. It may be suggested that in some country roads and village streets, or perhaps in cities, tracks are located at the extreme edge of the highway, where of necessity passengers alight from the left hand side, and the inconvenience of drivers of vehicles who wish to pass may be increased, and the safety of pedestrians correspondingly imperiled. The requirement, however, is only that the passing vehicle shall "drive to the left of the middle of the traveled part of the way," and, as we have pointed out, where the jury find the circumstances to be such that in the exercise of reasonable care the statute could not be literally obeyed, no inference of negligence can be drawn.

If under modern conditions of travel in our congested streets there is danger in requiring the driver of a carriage or other vehicle passing another carriage or vehicle traveling in the same direction to "drive to the left of the middle of the traveled part of the way," as is intimated in the dissenting opinion, yet we cannot disregard the express requirement of the statute; it is for the legislature to provide a remedy. Exceptions sustained.

Massachusetts Court Renders Dissenting Opinion

THE chief justice and Justices Hammond and Loring express their dissent from the opinion of the court upon highways in trolley cars public traveling and other vehicles and on foot which will their belief in the evil consequences to the ion of the instability of the court by reason of arise from it. The only question involved is whether, under R. L. c. 54, s. 2, the driver of a motor or horse-drawn vehicle overtaking and passing an electric car going in the same direction must leave it on his left. That question has never been decided by this court. In Burton v. Nicholson, 1909, 1 K. B. 397, the law under consideration was different in its language and history from our statute, and the court there felt compelled to hold that other vehicles passing tram cars must observe as to them the law of the road, although recognizing that so construed it was almost impossible "to be obeyed in a reasonable manner in practice." Within less than four months after that decision the order was annulled by the legislative body. See statutory rules and orders for 1909, p. 497.

A penal statute ought not to be interpreted so that it cannot be reasonably obeyed, or so that it will require further legislation to make it workable, unless no other course is open. We think it is plain that it was not the intent of the legislature to include electric cars or horse cars within the law of the road, and for these reasons:

1. It is shown by the history of the statute. The first statute as to the use of the road by travelers in carriages and other vehicles was St. 1820, c. 65. This act contained regulations as to travelers meeting upon the highway, but none as to travelers going in the same direction passing one another. It was embodied in substance in revised statutes, c. 51, without change. When the general statutes were enacted section 2, now under consideration, appeared for the first time, and another section, numbered 5, was added stating expressly that the provisions of the chapter should not apply to horse railroads. Gen. Sts. c. 77.

The reason for this undoubtedly was that the first statutes authorizing the construction of horse railroads were passed in 1853, and a considerable number had been passed before 1860. Gen. Sts. c. 77, appears substantially without change in Pub. Sts. c. 93. The commissioners for consolidating and arranging the public statutes, in their report of 1901, append to c. 54 a note to the effect that they have omitted s. 5 "as superfluous. The history and subject-matter of this chapter show that it has no application to railways whether operated by animal power or by electricity."

The law of the road as reported by the commissioners was adopted without change by the legislature, which means that the report and note were approved. Hence the purpose of the legislature in omitting from the law of the road in the revised laws the express exemption of horse cars and by necessary implication of electric cars, which had been in the two immediately preceding compilations of the statute law, was not to change in any respect the law as it had been for more than forty years. The primary significance of the exemption of horse railroads in Gen. Sts. c. 77, and in Pub. Sts. c. 93, is that the drivers of the cars of horse and electric railways are not bound to observe the law of the road. An equally necessary conclusion, however, is that such cars are not to be regarded as carriages or vehicles by other travelers. To say that the statute "shall not apply to" such cars is equivalent to saying that they are not "carriages" and "other vehicles" within the meaning of those words in the statute. They are extempted from the section touching the passing of one carriage or vehicle by another going in the same direction as much as from the section concerning those which meet going in opposite directions. They are excepted out of the statutory provisions both as objects and subjects of travel.

2. There are in the commonwealth many miles of electric railways constructed upon the side of highways. It is impossible to treat the law of the road as applicable to cars upon tracks so laid. The legislature cannot have intended to make the law of the road applicable in case of cars when it is impossible to obey it in these not infrequent instances where tracks are laid on the side of public ways.

3. The traveling public almost universally, according to our observation, has construed the statute in practice as not applying to street cars. When a statute regulating the daily conduct of thousands of people has received an interpretation by substantially universal custom, it ought not to be set aside unless strongly required.

4. The public construction of the meaning of the statute secures a far larger degree of safety than any other interpretation. There is no danger to any traveler in the careful passing by any vehicle to the right of an electric car going in the same direction, while there is or may be great peril in passing to the left, from behind the obstruction to sight and hearing, which an electric car usually is into the face of other traffic. The passenger alighting from the street car, either on the right or left side, is protected by the general requirement of due care from other travelers.

5. It is wellnigh impossible to obey the statute interpreted in any other way. Heavily-loaded vehicles on congested streets must be almost constantly violating the law (see Bryant v. Boston Elevated Railway, 212 Mass), or else cause great and unnecessary congestion of traffic. Many car tracks are laid in the center of roads where there is not room for two motor cars or carriages to pass on one side of the tracks. To require an overtaking motor car or carriage to drive to the left from behind an electric car into motor cars or carriages going in the opposite direction to say the least introduces confusion into travel, which may result in imminent hazard of injury.

6. The traveler alighting from the right side of a street car will be subjected under the other interpretation to the danger of vehicles approaching from a direction opposite to that in which the car is moving, while those alighting from either side must be prepared to avoid them coming from a direction to which they have been unaccustomed. The question is not whether the driver of a motor car should stop before passing a stationary car. That situation is not covered by the law of the road nor by this decision. It is governed by the general rules of negligence.

7. The other rule finds support in the provisions of R. L. c. 54, s. 2, which if construed literally requires one vehicle passing another to do the very thing which has been shown to be inherently dangerous, namely, to go to the left of the middle of the way; that is to say, into that part of the way appropriated to traffic going in the opposite direction. In the crowded streets of cities not only is this not the rule observed in practice, but passing vehicles are never allowed in the left of the middle of the way, even if they cannot otherwise pass those in front of them. Whether this section should or should not be construed to apply to those ways only when there is only room for two vehicles abreast it ought not to be decisive of the question under discussion. We think the ruling requested was refused rightly.

the rule of the road applied to other vehicles, and really meant to prevent anyone driving from behind and seeking to pass some one ahead, from being pocketed by reason of the forward driver turning to the right at the same time. In other words, the electric car, not being able to swing off its rails, it could not pocket any one coming from behind and so cause injuries to the following vehicles.

The attorneys for Foster took an exception to this charge to the jury, and the case was sent to the supreme court on that issue. So the judges have been pondering over it for some time and now the decision has been announced, which comes as a surprise.

Already there has been much comment aroused in Boston over it, but as yet the police commissioner, the Boston street commissioners and the highway commission refuse to make any comment until they study the decision. Moreover, comment must be guarded for it is the decision of the supreme court. There seems to be nothing left to do except wait for the legislature to meet next spring, and already motor organizations are preparing to have amendments made to the law of the road exempting electric cars. This will simplify the matter, for the court holds to the opinion that law is law and it must be obeyed. So the judge's opinion that Curtis did not violate the law in going to the right has been overruled and the exceptions sustained. The law of the road which is the cause of all the trouble now is found in two sections of the revised laws. The first one dates away back to 1820 and when the statutes were codified it was divided as follows:

Section 1—When persons meet on a bridge or way, traveling with carriages, wagons, carts, sleds, sleighs, bicycles or other vehicles, each shall reasonably drive his carriage or other vehicle to the right of the middle of the traveled part of such bridge or way, so that their respective carriages or other vehicles may pass without interference.

Section 2—The driver of a carriage or other vehicle passing a carriage or other vehicle, traveling in the same general direction shall drive to the left of the middle of the traveled part of a bridge or way; and if it is of sufficient width for the two vehicles to pass, the driver of the leading one shall not obstruct the other.

Then there is the acts of 1908, chapter 512 which reads as follows:

Section 1—Whenever on any bridge or way, public or private, there is not an unobstructed view of the road for at least 100 yards, the driver of every vehicle shall keep his vehicle on the right of the middle of the traveled part of the bridge or way, whenever it is safe and practicable so to do.

MARYLAND CLUB ELECTION

Baltimore, Md., Nov. 30—At the annual meeting of the Automobile Club of Maryland recently Dr. H. M. Rowe was re-elected president and the other officers were also re-elected as follows: Asa B. Gardiner, Jr., vice-president; H. M. Luzius, secretary, and Thomas G. Young, treasurer. Board of governors in addition to officers include James S. Reese, Joel G. Nassauer, Joseph M. Zamoiski, John S. Bridges and R. Milton Norris. During the year the club has taken in 305 new members and has posted 650 new road signs.

Grand Rapids Proud of Its Big Show

Thirty Thousand Persons Attend Exhibition and Reports Tell of Sale of 250 Cars—Many Wholesale Contracts Closed —Eighty Different Lines of Vehicles Displayed

GRAND RAPIDS, Mich., Nov. 30—With an attendance record of 30,000 people marked up to its credit during its 4 days and 5 evenings run, Grand Rapids fourth annual show ended most happily tonight.

In interest, attendance, value and variety of exhibits, and in everything but number of sales direct to ultimate consumers the show far eclipsed its three local predecessors. Upwards of eighty lines in 140-odd models, all represented by local dealers, were shown on the floors of the exhibit space, while everything in the line of accessories was shown, beside all motor cycles sold in this market.

Thanksgiving day and Friday brought out the greatest crowds, that of the holiday being a sightseeing audience. Friday's and Saturday's were the bargain seeking and buying assemblages. Incomplete reports tonight indicate that between 250 and 300 pleasure cars were sold outright to new owners, compared with between 400 and 500 at last year's show in February. The wholesale contracts closed with sub-agents was the most gratfying feature from the distributors' viewpoints, the early dates enabling them to practically close with dealers throughout all their territory.

Every grade and type of car obtainable in any market was included in the exhibition, as well as a comprehensive exhibit of commercial cars, from light delivery wagons to 5-ton trucks. The trade in this department was not extensive, most of the exhibitors contenting themselves with listing prospects, although to a man they expressed themselves as highly satisfied.

The buying trend noticeable seemed heavily to the medium and higher grades of cars. The Cadillac and Rambler lines, strongly represented, did heavy business. Several sales of $5,000 cars were effected these including Packards, Kissels and Whites. The Overland company exhibit, including every model of that line, the Marmon, Federal truck and Standard electrics, was turned over to the sub-agents of that company, twenty-four of whom were in almost constant attendance.

QUAKERS SEEK SHOW BUILDING

Philadelphia, Pa., Nov. 30—With Philadelphia's annual exhibition now only a matter of 2 months away, the question as to where it is to be held is up for discussion and final disposition again, but if a proposition now being advocated is carried to satisfactory conclusion the solution of this yearly problem will have been found, probably for all time.

This proposition is to hold next January's event in the newly-constructed garage of the Automobile Club of Philadelphia, Twenty-third and Market streets, where a combined floor space of 95,000 square feet would afford ample room to accommodate all the exhibits without crowding, and thus eliminate the necessity of conducting practically two shows simultaneously in two widely-separated buildings as has been the rule.

It is becoming apparent that even the two armories will not be sufficient for space allotments for cars and accessories if all the would-be exhibitors are not to be restricted as to size of space. As three floors of the Automobile Club of Philadelphia's building are completed and in use with a combined area of more than 95,000 square feet and the floor space of the First Regiment armory and the Third Regiment armory only aggregates two-thirds of that amount, the proposition that the club and the Automobile Trade Association co-operate and use the former's building is receiving favorable consideration.

The board of governors of the Automobile Club of Philadelphia has sent to the nearly 1,600 members a blank soliciting expressions of their views on the subject of leasing the building for the period required, accompanied by a statement by Powell Evans, president, urging support of the movement.

SHOW ROW IN WASHINGTON

Washington, D. C., Dec. 2—A row has arisen in the motor car ranks over the proposed show. Last week T. Oliver Probey president of the Michigan Motor Co. and the Probey Carriage Co., announced there would be a motor car show at Convention hall during the week beginning February 2 with himself as chairman. Taking the ground that they had not been consulted in the matter, the dealers composing the Washington Automobile Dealers' Association, former promoters of the annual show, held a meeting and adopted a resolution to the effect that a 1913 show was inadvisable because of the lack of a suitable place in which to hold it, the members being of the opinion that Convention hall was unsafe and inadequate to accommodate those who might wish to exhibit, and pledging themselves not to exhibit in any show held during 1913. The dealers at the meeting decided it would be better to have a carnival week February 10-15 instead of a show. Undaunted by the action of the dealers' association, Chairman Probey announced his intention of having a show anyway.

Annual Show Problem Worries French

Proposition Being Considered to Alternate, Having Pleasure Car Exhibitions One Year and a Display of Commercial Motor Vehicles the Next—Spain and Russia in Line

PARIS, Nov. 22—With the salon about to open, French manufacturers are considering whether they shall make the event annual or hold it every 2 years. Four years ago it was believed that a show could be dispensed with, but the experiment soon showed that business was lost and that the London trade was securing a commercial advantage by the absention of Paris.

It therefore was decided to hold the show every 2 years, but a certain number of the members of the trade have not ceased to clamor for an annual event. There is a growing feeling that if the pleasure car show is held every 2 years, a big commercial vehicle show should be held on alternate years. This would give 1 year for the present pleasure car show, and the following year for the commercial exhibits, both displays being in the Grand Palais.

The Chambre Syndicale de l'Automobile, one of the three trade associations jointly responsible for the Paris salon, has already passed a vote in favor of the alternation of pleasure and commercial vehicle shows. It is thus likely that next year the Grand Palais will be occupied exclusively by motor trucks and kindred vehicles.

The coming show, to be opened on the morning of December 7 by President Fallières, promises to be one of the most successful ever held in France. Although the Grand Palais is the biggest hall in Paris, every inch of space has been let and about 200 applicants have been unable to get in. This has caused the creation of an independent overflow section in the Jardin do Paris, a famous Parisian pleasure garden usually closed at this time of the year. The overflow section is being held independently of the manufacturers' show, but is being officially supported by the city authorities.

Barcelona will hold a show from March 8 to April 2, this being the first public motor exhibition held in Spain. St. Petersburg has decided to hold its fourth annual show during the month of May, 1913. The exhibition will deal with both pleasure cars and commercial vehicles. The French manufacturers taking part are Brasier, La Buire, Delahaye, Delaunay-Belleville, Lorraine-Dietrich, Mors, Panhard-Levassor, Peugeot, Renault, Rochet-Schneider, Lafourdette, Kellner, and Bergougnan.

STRIKE THREATENED IN AKRON

Akron, O., Dec. 2—Following a cut of 20 per cent in the wages of tire makers, an effort is being made to start a strike among Goodrich employes for higher wages it is said. The cut in the Goodrich was made about a week ago, and officers of the company stated that on account of improved machinery 20 per cent more work could be done, figuring on the theory that the tiremakers who do piece work will not suffer.

The International Workers of the World have been sending agents to Akron for more than a year to stir up a strike and they are in charge of the present movement. A stormy meeting of the tiremakers was held here Saturday night but nothing was definitely decided on. The strike should it be inaugurated would effect only Goodrich employes at first, although the other companies would likely be effected later on.

NEW IDEA IN STREET CLEANING

Indianapolis, Ind., Dec. 2—An informal bid has been received by the board of public works from the Furnas Pneumatic Sweeper Co., to clean the improved streets of the city for $100,000 a year. The offer, if accepted, would mean a saving of from $30,000 to $50,000 a year, compared with what the city is now paying with its own equipment.

The company manufactures a motor pneumatic sweeper which, it is said, will do the work of several horse-drawn sweepers. It is located in this city and has experimented with the sweeper in New York and other cities.

It is proposed by the company to use the motor sweeper 8 months each year, from April to December, the city to fix a schedule of sweepings similar to that now in force. From December to April the company would clean the streets according to the orders of the board, using during this period the apparatus now owned by the city, which the company proposes to take over at a fair appraised value.

FRENCH CAR CENSUS

Paris, Nov. 23—France possesses 76,771 private owned cars having paid taxes during the year 1912. The figures show an increase in the number of cars during the year to the extent of 12,562. These figures are generally accepted as an estimate of the number of cars in use in France, but they are, in reality, of a very conservative nature.

Manufacturers' test and demonstration models, taxicabs, commercial vehicles of all kinds, foreign cars brought in temporarily, and all motor cycles, are exempt from direct taxation and consequently are not included in the returns. It is probable that the total number of motor vehicles in use in France is about 100,000.

The record for any one department is held by the Seine, which includes the city of Paris, where there are 13,389 privately-owned cars, the increase being 2,025 since last year. The next departments in importance are Seine et Oise, Seine Inferieure, and the Nord. The low-water mark is held by Corsica, with only nineteen cars, compared with twenty-one last year. It is the only district having reduced its number. Mountainous Lozere possesses but fifty-four cars, the Hautes-Alpes have sixty-four cars, and the Basses-Alpes 106. The average horsepower of the cars in the whole of France, on the French basis of estimating power, is 13; and for the Paris district the average horsepower is 16. The official figures for the last 6 years are as follows:

1907	31,286	1910	53,669
1908	37,586	1911	42,609
1909	44,769	1912	76,771

FRENCH REPORTS ON EXPORTS

Paris, Nov. 23—For the first 10 months of the present year France exported cars to the value of $34,709,280, compared with $26,443,800 for the corresponding period of the preceding year. Increased business was done with all nations with the exception of five—Italy, Turkey, Russia, Austria, and Switzerland. Great Britain still heads the list as the best customer of France with $9,537,600 worth of business for the 10 months, compared with $8,591,880 for the first 10 months of 1911. The next on the list is Belgium, with nearly $8,000,000.

There is a considerable increase in the number of cars sent to America, the values being $857,820, compared with $474,120 for the previous year. On the other hand, American imports have jumped to the extent of $340,000. The total value of foreign cars brought into France is $2,245,800. America is responsible for practically the whole of the increased imports. The official returns for the export of motor cars from France for the first 10 months of 1912 are as follows:

Country—	1911	1912
Great Britain	$ 8,591,880	$ 8,591,880
Belgium	4,981,980	7,966,140
Algeria	1,906,980	3,052,980
Germany	2,204,040	2,698,560
Argentine	1,345,680	2,314,600
Brazil	972,900	1,716,960
United States	474,120	857,820
Spain	501,000	808,560
Switzerland	922,620	709,020
Italy	760,320	445,140
Russia	449,880	382,840
Austria	380,880	174,780
Turkey	284,400	120,660
Other countries	2,011,180	3,861,600
	$26,443,800	$34,709,280

CHICAGO CLUB ELECTION

Chicago, Dec. 3—The annual election of the Chicago Motor Club, which took place tonight, resulted in a victory for the regular ticket, N. H. Van Sicklen, Sr., defeating F. E. Edwards for the presidency, 295 to 205. The new set of officers consists of the following: President, N. H. Van Sicklen, Sr.; first vice-president, Henry Bosch; second vice-president, Thomas J. Hay; treasurer, A. M. Cobb; secretary, W. E. Stalnaker; directors, L. A. Watts, E. G. Westlake, W. D. Foreman, W. J. Zucker and W. J. Boone; auditing committee, F. L. Eskey, R. G. Melcher and J. F. Meyer.

Creditors Discuss Flanders' Affairs

DETROIT, MICH., Nov. 30—A statement of the affairs of the Flanders Mfg. Co., Pontiac, Mich., was heard by the merchandise creditors, representing 70 per cent of the total indebtedness of the concern, at a meeting held at the Pontchartrain. A committee of three was appointed to devise ways and means of continuing the business.

This committee, which was composed of G. W. Rogers, Goodyear Tire and Rubber Co., Akron, O.; S. T. Douglass, attorney for several of the largest stockholders, and W. S. Thomas, Wagner Electric Mfg. Co., St. Louis, represented the largest creditors, and was instructed to report to a committee of seven, composed of creditors next in order of magnitude. The latter was to act as an advisory committee to confer with the directors.

The Flanders Mfg. Co. has a merchandise indebtedness of $500,000 and outstanding notes to the amount of $350,000, totaling $850,000 assets, including the electric vehicle plant. The motor cycle factory and other holdings of the company amount to $2,135,000. The company's financial difficulties are all through lack of working capital and the indebtedness, only $40,000, of which is held by concerns having credits under $2,000 evidently can be squared away in the event of the closing out of the business. Many of the creditors, however, are of the opinion that by raising about $200,000 it will be able to profitably escape from its difficulties.

The electric car plant always has been a money-maker and the other holdings have been responsible for the present lack of working capital.

A notice of the creditors' committee proceeding was sent to every creditor, together with a forbearance agreement which they were requested to sign, thereby agreeing to waive the enforcement of their claims for a period of 90 days, unless, in the opinion of the committee, earlier action was deemed advisable. To date about 150 creditors out of the 500, besides the principal ten, have signed this agreement, which extends to the committee full and exclusive authority to act for the signers. The committee now has control of the majority of the credits and can act with authority when conferring with the directors.

ROAD BUILDERS MEET

Cincinnati, O., Dec. 2—The ninth annual convention of the American Road Builders' Association and the third American Road Congress will be held here at Music Hall, starting Tuesday and running to Friday. The program which has been mapped out is an extensive one. A special feature of the convention will be a big entertainment given in honor of the visitors at the Business Men's Club on December 4.

Inquiry Shows Manufacturing Company Needs More Capital

It is expected that there will be an attendance of between 1,500 and 2,000 at this affair.

Nelson P. Lewis, president of the American Road Builders' Association and also chief engineer of the board of estimate and apportionment of New York City, will call the convention to order Tuesday morning at 11 o'clock. Following the adjournment of the first session, President Lewis, Harold Parker, head of the good roads' movement in Massachusetts, and Secretary Powers, of the Road Builders' Association, will be the guests of the chamber of commerce at the regular noon-day meeting at the Sinton hotel.

An interesting display of the convention this year will be that of road building machinery. Many reservations for space have been made by machinery and material dealers.

NEW REPUBLIC OFFICERS

Youngstown, O., Dec. 2—At the directors' meeting of the Republic Rubber Co. on November 27 the following elections were made: L. T. Petersen was chosen first vice-president, succeeding L. J. Lomasney, deceased; John H. Kelly was chosen second vice-president and director, succeeding L. T. Petersen as second vice-president; A. H. Harris was chosen a director of the company, filling the remaining vacancy on the board. In addition to his work as general sales manager, Mr. Kelly, as second vice-president, will cooperate with the president and other officers, above mentioned, in general matters of management.

GENERAL VEHICLE REINCORPORATES

New York, Dec. 3—Changing the form of its business organization and enlarging its capitalization, the General Vehicle Co. has been reincorporated under New York laws for $10,000,000, divided evenly between preferred and common stock. The company always has been more or less of a close corporation and its character will not be changed by the new move. The present stockholders will be offered the option of taking the new issue, or as much of it as shall be issued at par. The present capitalization is $1,000,000.

The reasons for the increase are that the company requires more liquid capital to finance its plans for the immediate future. These plans include the installation of a huge factory for the manufacture of Mercedes trucks and also another large factory for the making of electric vehicles. The foundation of the new six-story building at Long Island is completed. The General Vehicle Co. has been ultra-conservative until recently, when it branched out into the gasoline field. It has been tentatively announced that there will be some additions to the present line of electrics and possible some changes in the roster of officers.

BUYS PART OF W. C. & P. PROPERTY

New York, Dec. 3—Leaseholds on the property occupied by Wyckoff, Church & Partridge, Inc., at Fifty-sixth street and Broadway, including the garage and supply store, have been sold by order of the United States district court to H. M. Swetland, for the Swetland Operating Co. It is understood that negotiations are under way to transfer the property to a garage and selling concern, or to an operating company.

On Saturday the transfer of the property to the purchasing syndicate consisting of Messrs. Ellis, Griswold and Dickinson was completed. The syndicate acted as intermediary between the receiver and the Swetland Operating Co. as the leasehold involved was a part of the bankrupt estate included in the terms of purchase.

No further developments as to the new corporation to succeed W. C. P. have been reported and announcement has been made that, while the preliminaries are finished no outline of its scope and plans will be made until next week.

TRIES OUT NATURAL GAS

Pittsburgh, Pa., Dec. 2—F. P. Peterson, of the Bessemer Gas Engine Co., in a recent issue of a paper of that company, made statements that are of interest to motor car makers and users. He said that it is entirely feasible to drive motor cars and, in particular, motor trucks, on natural gas. This, he said, can be done economically, as has been proven by actual tests. He says that 1,000 cubic feet of natural gas is worth, in fuel value, to 50 pounds, of 8 gallons, of gasoline.

Steel bottles, such as are used in the transportation of liquid carbonic dioxide are employed and the gas is compressed in them to a pressure of 100 atmospheres, by which method considerably more than 100 cubic feet can be carried in a single bulk. Two bottles are carried on a small car and the radius of action seems to be equivalent to that available from 2½ gallons of gasoline. When gas is obtainable at such a cost as at present, it is said that the saving would be considerable.

The scheme is particularly adaptable to motor trucks, Mr. Peterson says, as these machines have a decreased radius of action and can call at central replenishing stations for exchange of fuel bottles without any trouble.

Northway Buys Ohio Company Plant

Virginia Concern to Take Over Factory of Cincinnati Car Maker

CINCINNATI, O., Dec. 3—The assets and property of the Ohio Motor Car Co., of Carthage O., declared insolvent a month ago, will be taken over by the Northway Motor Co. The Northway company was recently incorporated in West Virginia with a capital of $600,000. It intended to build a factory here. After several conferences with the chamber of commerce, bringing together the contending factions in the litigation over the plant of the Ohio company, it was decided to make a bid to Receiver Edward Schultz. The lump bid was $65,000, which Judge Wade Cushing, of the common pleas court, ordered to be accepted.

William Padlioie, of Hartwell, O., is connected with Northway. They agreed to pay down $5,000 to bind the sale and to give $25,000 mortgage on the plant, and $30,000 additional cash when the sale is ordered. Several creditors of the defaulting company were petitioning for the sale of the concern under bankruptcy proceedings, but the chamber of commerce industrial committee got them together and it was called off.

The plant controls 10 acres of ground, about 3 acres of which is now under buildings. The new company will increase accommodations. It will manufacture motors, the main part of its industry, and at the same time continue to produce the Ohio car.

Mr. Northway states that the new company will start just as soon as court matters are settled. He is the president of the concern. Between 200 and 300 men will be employed. Charles F. Pratt was president of the old company, which has gone into bankruptcy on two occasions.

NEW CLUB FOR NEW YORK

New York, Dec. 3—Plans for organizing the motor men of New York into a club along broader lines than the Automobile Club of America are making progress. The first call was made October 1 by E. E. Schwarzkopf and since that time 122 names have been added to the list of founder members. Those who have identified themselves with the movement include leading dealers, officers of the national organizations and members of the motor and accessory trades.

The preliminary list shows that the new club, which will be called the Automobile Club of New York, is to be an association of the motor industry. Sidney S. Meyers has been named counselor.

The objects of the club, as announced in its prospectus, are as follows: To provide a social club in the neighborhood of Columbus circle; to stimulate public interest in the motor car; to cultivate closer relations between the trade and the users; to secure the advantages of co-operation and to provide a center of information and advice.

According to the first bulletin sent out by the club, temporary quarters have been secured and several propositions looking to the location of the club near Columbus circle have been received. A meeting of the founders will be called in the near future to take up the matter of permanent organization and the election of officers.

BRIGHT SUCCEEDS HESS

Philadelphia, Pa., Dec. 3—Fred E. Bright has taken active control of the Hess-Bright Mfg. Co., which has been purchased outright by the Deutsche Waffen' und Munitions Fabriken, or D. W. F., succeeding Henry Hess as president. Mr. Bright formerly was vice president and treasurer of the Hess-Bright company. Mr. Bright has been identified with Mr. Hess since the founding of the company, and as early as 1890 he manufactured ball bearings of other forms. He also was associate inventor and designer of a linotype in 1893.

TRAFFIC TROUBLE IN CINCINNATI

Cincinnati, O., Dec. 2—Cincinnati is having more trouble with its traffic laws than any other city in the states right now. It seems that about four or five city executives do not work in perfect harmony in drafting new rules, with the result that one day a law is made, the next day it is changed and the next it may be wiped out altogether.

The most recent discussion was entered into over the rule prohibiting cars staying on certain streets in congested districts without an attendant. The merchants in these busy sections immediately arose in arms, protesting that it would hurt their business. Chief of Police Copelan declared that it would lessen the danger in case of fire, or any other accident, and that this rule would have to stand. The protest entered by the merchants was so strong, however, that the city council decided to allow a vehicle to stand 5 minutes without an attendant. The managers of the big stores then claimed that 5 minutes was not enough for a woman to do her shopping in. The thing was taken up again and now Safety Director Cash has issued an order changing the time limit to 10 minutes which unattended machines can stand in congested districts.

Electric cars which, it has been found, are used by many women on their shopping tours, will be allowed to stand unattended 30 minutes. The congested district covers busy Fourth avenue, where all the large retailing stores are located. The new ruling has caused many interesting discussions. Some storekeepers have provided men to drive cars to parking spaces on Eighth avenue and then have them returned when the customer is through shopping. One councilman has an idea that it would be better to cut out the esplanade on Fifth avenue and utilize it for parking space. However, this will hardly be done, as it would take any one of the scenic spots of Cincinnati.

DOCTORS ORGANIZE CLUB

Wilmington, Del., Nov. 30—In order to take advantage of an exemption in the Delaware motor law, which permits physicians on emergency calls to exceed the speed limit, and also to band together so as to buy motor car supplies in pool, at wholesale rates, thirty Delaware physicians, nearly all residents of Wilmington, have organized the Physicians' Motor Club of Delaware, the following officers having been elected for the ensuing year: President, Dr. J. Paul Lukens; vice-president, Dr. Willard Springer; secretary, Dr. Albert Robin; treasurer, Dr. Edgar Q. Bullock; board of directors, Dr. Henry R. Spruance, Dr. H. R. Pennock and Dr. H. W. Briggs.

The formation of a club would not be necessary to take advantage of the speed law exemption, but by forming such an organization it was possible to adopt an emblematic tag which shows that the owner of the car is a physician and is sufficient explanation to an officer who divines that a car is going too fast. The tag is placed near the license tag. It is about 3 inches in diameter, with a blue circle on the outside, containing the name of the club, and a red cross inside the circle.

THANKSGIVING DAY CLIMB

Evansville, Ind., Nov. 30—Walter Helmick, in a Pope-Hartford, won the Courier cup in the Thanksgiving day climb on Stringtown hill, defeating a Cole, Stanley, Ames and Thomas. The Ford won the 230 and under event and the Cadillac the other event. Three events were contested. Coming on a holiday, there was a large crowd out. Summary:

UNDER 230 INCHES

Car	Driver	Time
Ford	Zumstein	:51 1/5
Flanders	McNeely	:52 1/2
Buick	Schlensker	:56 1/2
Regal	Lahr	1:04

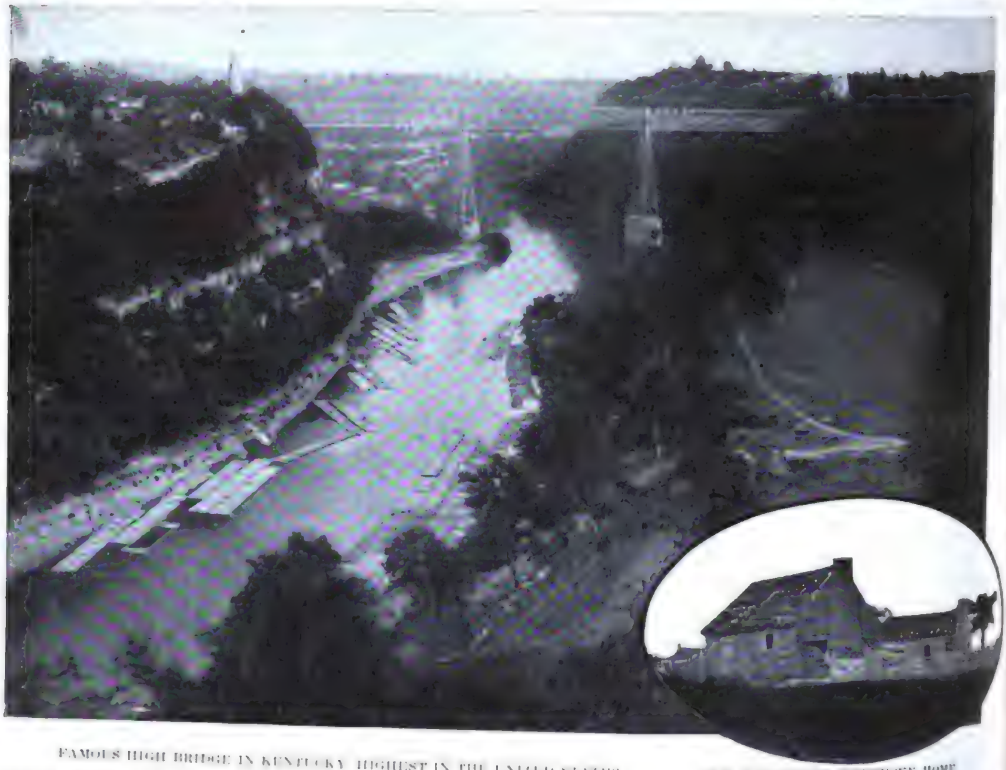
OVER 230 INCHES

Car	Driver	Time
Cadillac	Senger	:48
American	Scherffius	:48 1/2
Pullman	Muller	:49
Cole	Allen	:49 1/2
Cadillac	Geissler	:55

FREE-FOR-ALL

Car	Driver	Time
Pope-Hartford	Helmick	:36 2/5
Cole	French	:42 1/2
Stanley	Rothrock	:44
Ames	Jones	:52 1/2
Thomas	Miedreich	1:03 1/2

Routes *and* Touring Information



FAMOUS HIGH BRIDGE IN KENTUCKY, HIGHEST IN THE UNITED STATES

OLD FASHIONED KENTUCKY HOME

Nine Days of Rest

By G. E. Robbins

FOUR congenial souls, lovers of nature and outdoor life, filled through and through with good red blood, left Chillicothe, O., July 25, 5 a. m., bound for the Mammoth caves of Kentucky. C. M. Haynes, driving a Marion car, was at the wheel, and by his side sat Dr. R. W. Holmes, treasurer for the trip, who handled all the funds, directed the party to the hotels, paid all bills and smoked most of the cigars. The rear seat was occupied by F. C. Kirkendall, who gave dignity to the venture, and kept us posted on the historical features of the many places visited and Dr. G. F. Robbins, the soloist of the quartet. Although the other three protested against so much song at first, on the latter part of our touring they either learned to sing or they sang in self defense, for many an evening mile we made the hills and valleys ring with our joyous music.

Out west through the fertile Paint valley our Marion hammed for 19 miles, when we reached Bainbridge, a busy little village, close to the Highland county line and near the famous Bainbridge caves. These caves are visited by many tourists every year and they are well worth coming to see. Fairly good hotels are conveniently located to care for all.

Through Paint Valley

Leaving Bainbridge and the Paint valley we wound around the Highland county hills and on over a splendid road into Hillsboro, 18 miles from Chillicothe, then on to the south over a fairly decent road to Ripley, passing on the way hills that rise almost to the dignity of mountains, but on whose sides were growing splendid corn, tobacco and other crops.

From Ripley we hurried to Aberlem, reaching there just in time to catch the ferry boat, so we were soon over the Ohio, muddy and high at that time, and on to Maysville, Ky., where we stopped for lunch and a little gasoline; a forenoon's ride of pleasure and enjoyment, every minute of the 83.4 miles.

From Maysville, up, up we rode until the scenery was widened in magnificent expanse, the Ohio river being seen for many miles, and we stopped the car hundreds of feet above the river level to feast our eyes upon the gorgeous panorama before us. But we hastened on, Lexington had to be reached for our first night out, and over fine improved roads, round and round we went, curve and curve and compound curve, horn blowing and whistles shrieking to warn the coming travelers. We enjoyed the turns in the road for we were alert to see what new beauty would

come into view with each turn, stopping occasionally to drink in some exceptional attraction, then gliding along over roads as smooth as a floor, on into Paris. Here we stopped just long enough to lay in a supply of chewing gum and a little face cream, for by that time our tender faces were beginning to feel the effect of sun, dust and a constant pressure of air.

Entering the Blue Grass Country

From Paris to Lexington we saw our first Blue Grass country, world-wide known and famous for beauty and chivalry; 18 miles of beautiful farms; elegant and refined homes, located back from the road far enough to be free from any travel annoyances, surrounded by magnificent walnut and elm; beautiful drives bordered by shrubbery and flowers, just enough to add to the delight of it all. No wonder those old mansions developed men of serious thought, and sober, honorable characteristics. The quiet home gave them opportunity for just such reflection that is needed to develop manly character.

Lexington was reached 2 hours before sun-down. "On to Richmond," was the cry bright and early next morning and after a good breakfast we whisked out into more Blue Grass country, passing through Richmond, Lancaster, Danville, Harrodsburg and Shakertown, stopping at High Bridge, one of the scenic beauties of the Kentucky river and one of the most interesting points we visited. The High Bridge is not the only point of beauty and interest in this part of Kentucky. The approach to Brooklyn bridge, coming down the long winding slope into the canyon—for canyon it really is—the precipitous cliffs of limestone and shale, the winding ribbon of river at the bottom and looking on and up we see our road miles ahead leading out of the valley, furnishing a scene never to be forgotten. And not without interest is the toll bridge crossing the river. The Scotch Irish lady who took our fare was not without humor either, for when our treasurer understood the toll to be 5 cents, when it should have been 40, her eyes sparkled and with a sharp tongue she asked if we were all deaf, and then lifted the gate and started us on our way with a sally of wit appreciated by all and such as only her nationality can use.

Our route then led to Versailles, stopping on the way at the famous Alexander farm and driving over a part of the beautiful estate shaded by the largest walnut trees we have ever seen anywhere; then to Frankfort, the capital of the state. Nothing of especial beauty or interest is there except the Capitol building, which is a splendid piece of architectural beauty, a credit to the state.

From Frankfort to Louisville are 53.6 miles of fine road through a beautiful rolling country. Lunching at Louisville, we soon rolled away to the south, reaching Bardstown, 12.6 miles, in record time. Up to this point we had been blessed with fine roads, but now we were to experience riding over the old Louisville and Nashville pike, or rather, the remains of a road that had been built more than 50 years ago and never repaired to any extent. Here Mr. Haynes ran his car for more than 40 miles over awful roads, through Sand hollow, up hill and down, the greater part of the time on low speed, and never murmured; the car partaking of the driver's spirit never missed an explosion. We reached Buffalo early enough to run out to the Lincoln farm, the shrine of every true American, and felt proud to know that the Lincoln cabin is protected by a magnificent granite building that will stand for ages. The grounds around the building are being beautified gradually, but the old spring remains just as it has been for many years.

Pike Road in Frightful Shape

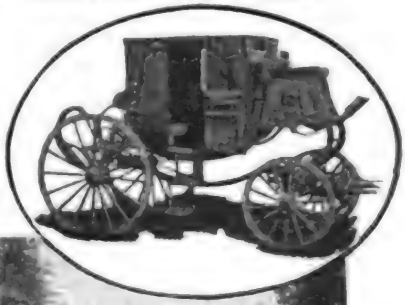
From Buffalo our course took us to Horse cave, where we had a fine chicken supper, prepared after 7 o'clock by a good woman who seemed proud to serve us, even after regular hours, with good things to eat. An early start from here soon put us over more bad road. We reached Mammoth cave about 10:30 and visited the underground cavern in company with a hundred or so other excursionists, when after eating a poor lunch, we motored on south to Bowling Green and thence to Nashville, Tenn.

All along this route we found the people filled with enthusiasm over the project of the great highway being built from Nashville to Louisville going by the Lincoln farm, and to be known as the Lincoln way. Once completed such a road will open up a gateway between the north and south that will attract motorists from far and wide.

Really the most interesting part of this day's journey was in our experience with the people on our way. As we stopped at some small village the natives would gather about our car, full of curiosity, and in the most candid way converse with us freely on any subject. When we inquired about other towns only a dozen miles away we were surprised to find not more than one or two out of a score of men and boys had ever visited their neighboring village. Through this region we saw the Kentuckians' finest horses, but the fine horses proved to be fine mules. And they were fine, too; great big, strong sleek animals and every one fearfully afraid of an auto, all but one. A short turn in the road brought into view a man in an open buggy driving a big old mule, and not having time to get over on his side of the road he slyly winked at our party and sang out at the top of his voice, "Get up there, Sal, doggone your old hide"; evidently blaming the old mule for his predicament. But "old Sal" was onto her job and seemed to understand the humor of the situation and plodded on, never changing her gait a particle.

Nashville is a beautiful and thriving city, but we enjoyed the Hermitage more than we did the city. Jackson's home and burial spot is well worth visiting. It is a beautiful old mansion filled with pictures, furniture, bric-a-brac and articles of the Jackson time.

ANDREW JACKSON'S STATE COACH



LINCOLN MEMORIAL, ONE OF THE TOURING ATTRACTIONS IN KENTUCKY

From Nashville we journeyed through Clarksville to Hopkinsville, the great tobacco town, where we tarried for the night, then on to Madisonville and Henderson, Ky., the next morning. Here we ferried the Ohio, passing through Evansville and stopping at Princeton, Ind., for the night. Next morning we ferried the White river and passed on to Vincennes, running over into Illinois then on to Indianapolis by way of Terre Haute.

in fewer quantities annually than 25, as

Here Mr. Haynes deemed it advisable to have his car looked over to see if the grueling it got on the rocky roads had in any way done damage. No serious trouble was found, but a few minor changes were gratuitously and cheerfully made. Such kindness and courtesy on the part of the makers was thoroughly appreciated by our party. From Indianapolis we sped to Cambridge City, whose main hostlery serves famous chicken dinners, which our party did not miss, and then to Richmond, Ind., for the night.. From Richmond our course was through Dayton and Xenia, O. From Xenia we started home, completing a 9-day trip not excelled in beauty anywhere. We traveled 1,170 miles in 9 days without a single serious annoyance, and driving the first 600 miles without adding a drop of water to the radiator or an ounce of oil to the engine.

Supplies Used

Upon leaving Nashville the radiator required less than a pint of water, and only 2 quarts of oil were added to the engine. No further addition of water or oil was made from Nashville to Indianapolis. Four punctures on the whole trip was a little variation that did not annoy us.

The whole trip was made on 97 gallons of gasoline, an average of 12.06 miles per gallon. The running time was 79 hours and 52 minutes, an average of 16½ miles per hour. Average daily run, 130 miles.

The weather was perfect and we rode with top down throughout the trip, never missing a ferry boat or a meal. All of us were strengthened in body and of one accord we join in saying that earth affords for us no finer recreation than this 9-day vacation.

Dodge City, Kas., to Phoenix, Ariz., the Borderland Trail

By C. H. Lester

My first thought was to write the story of the finding of the route from Dodge City, Kans. to Phoenix, Ariz., now known as the Borderland route, but instead I will endeavor to make this article as helpful as space will permit to motorists who may wish to drive this way into the southwest.

On my way south recently I drove from Dodge City westerly to Santa Fe, Kans., then southerly to the Edmund ford across the Cimarron river. This section of the road I cannot recommend, but much prefer the original route as first traveled by me via Fowler to Plains and thence straight west to Edmund ford. This route is through a farmed district, with towns, garages, etc., and better roads, instead of through a ranch country. While the Cimarron is as noted as the Gila for treacherous sands, the Edmund ford is firm and hard with easy approaches. I have crossed this ford twice in November and in June of this year and have never found it to exceed 10 inches of water. Between the ford and Liberal is several miles of rather heavy sand, with a slight up-grade. From Liberal the route in a general way follows the Rock Island railroad through the Oklahoma panhandle to Hooker, Optima, Guyman, Goodwell and Texhoma. While this part of Oklahoma is fairly well settled there has not been much road work done, except to build bridges, and as the soil becomes very soft under heavy rains and bakes when drying, the road is somewhat rough afterward.

Location of Road

From Texhoma the road parallels the Rock Island to Stratford, Tex., where it leaves the railroad and goes nearly south through a ranch country to the little town of Dumas, thence south to Amarillo, crossing the Canadian river 20 miles north of Amarillo over a good bridge. The brakes on each side of the river have been improved by the building of a very good road during the past summer. From Dumas to the Canadian river signboards have been erected by the Dumas Drug Co.

From Amarillo the road continues south through Canyon, Happy, Tulia, Plainview, Abertheny and Lubbock where the railroad is left. From Texhoma to Lubbock the high level tableland of the Texas panhandle is traversed and the road penetrates deep into the south plains country or the Llano Esticado of the Spanish explorers. On this section one passes through a pleasing variety of ranch and agricultural lands; through several thriving modern little cities and over good roads. There is nothing of moment however, in a scenic way, to interest the tourist except the Paladora canon near Canyon. To me, however, the great irrigation development at Plainview was interesting.

Toll Road from Lubbock

Leaving Lubbock a fairly good exclusive motor car toll road—toll $1—extends southwest to Brownfield, Gomez, then Plains. East of Plains there is some sand, but not very bad, as it has been mostly removed from the road. Going northwest from Plains about 3 miles a high plateau country is passed through to Broncho, entering New Mexico to Tatum, Four Lakes ranch, noted locally for its weeping willows, and on west to Mescellero pass—the entrance to the Mescellero valley and its once noted and almost impassable barrier of sand dunes. From Plains, Tex. to Mescellero pass, the road is well traveled and passes over a high level gyp strewn plain but it is reasonably fast.

From Mescellero pass I continued westwardly to the sand dune district which is now bridged by a very good road of clay and calichie construction. Beyond this built-road the going is rather difficult in spots, because of short stretches of sand that are yet uncovered. For several miles just east of the Pecos valley, the gypsum cap rock, because of its varying hardness, has become pitted and rough under the heavy travel. Entering the Pecos valley a good graded road is found, but a barren district until after the river is crossed where one is greeted by a beautiful district of flowing wells, green alfalfa fields, large apple orchards, heavily tree lined avenues and Roswell, N. Mex. While far east of the Pecos valley, if the day is clear, the tourist may see in the far western distance the towering peak of El Capitan—the first view of a mountain thus far. Leaving Roswell over the Lincoln stage road 50 miles to Hondo, the motorist must be careful to take the road bearing north and just west of the state station, 21 miles out, going around the north side of Boundary hill. I have driven over this hill, but would caution any motorist against doing so, unless he is deliberately looking for trouble. Reaching Hondo I crossed the easy ford of the Rio Hondo where a concrete bridge is now being built, and proceeded up the narrow mountain-walled valley of Rio Ruidoso, passing Glencoe. From the Ruidoso cross near here, the road bears more to the south and soon enters the Mescellero Apache Indian reservation, and in due time and over a beautiful easy mountain road, the summit of the pass over the White or Sacramento mountains is reached. Then by an easy descent Agency and Tularosa valley are reached and a good government road leads into Tularosa.

In New Mexico

Near the Agency and connected with it by a road is Cloudcroft—a place of great scenic beauty and the summer resort of the city of El Paso. Cloudcroft is also reached from Alamogordo by train, stage and motor car. The scenery on this mountain drive from Roswell west is quietly beautiful rather than rugged and grand, being a pleasing combination of bare rock, wooded mountain-side, cultivated valley farms, and winding along at your side flows the little mountain river. As the altitude of the Tularosa valley is much greater than that of the Hondo where the road enters it, the ascent is mostly on the east side of the summit with a

mile long, fairly uniform grade, with no dangerous places whatever, if the ordinary caution that should always be used in a mountainous country and on unknown roads, is observed. Should one not wish to stop in Tularosa, upon reaching the Alamogordo signboards in the east part of town, a south turn can be made following the pike to Alamogordo which is usually a night control going either way.

I went southwest to the celebrated White sands skirting it for a short distance finally bearing more to the south over the mesa lying between the White and Organ mountains. This road is fairly good, with but little sand or rock and is signposted to El Paso. After a run of a little less than 100 miles the end of the mesa is reached and the grounds of important army post of Fort Bliss entered. At the signpost on the mesa marked "To Los Cruces" one may turn to the right, passing through Organ Pass and into the Mesilla valley, thence south from Los Cruces over the Camenso Real to Anthony and over the paved road to El Paso.

By way of Fort Bliss, El Paso, the metropolis of the southwest, can be seen lying in the valley of the Rio Grande below, while beyond the river may be seen C. Juarez in the land of Manana.

Equipment Necessary

Should one ask what equipment is necessary in making this trip, I would first emphasize the axiom of all experienced motorists which is to travel light. Leave or ship everything that can be discarded. Aside from the work or driving suit, one change suit with necessary under wear, overcoat, toilet articles, is all that is really needed. Any type of gasoline car in good condition will make the trip, as many have done so since I first drove over this route one year ago, and they have ranged in size from the powerful six cylinders to the baby Metz.

As to car equipment, unless an odd sized casing is used, one is enough with any two extra tubes, as casings and tubes can be bought at many places enroute. Secure a canvas desert water bag of 3 or 5 gallons capacity to carry water for drinking and radiator use. Gas and lubricating oil can be obtained at frequent intervals all along the route—even such points as Broncho, Tatum, Mescallero Pass, Picacho, Hono, Glencoe and Ruidoso carry these supplies. Water is to be found all along the route and so far as I know is all good, except that from the well in the courthouse grounds of Plains, Tex., which is strongly impregnated with gypsum. Carry a light hunter's axe, a short-handled sharp shovel, and the light rope, pin and hammer necessary in applying the windlass hitch to the car when stalled in mud or sand, or for a sharp bank or ditch the car cannot pull. Beside being light and portable, I consider this appliance of more value than all the blocks and tackle, canvas, etc., one could carry in a lumber wagon.

All through the range country ranch houses and stock wells are met frequently. The motorist should arrange the running schedule so as to stop over night at either Brownsfield or Plains, Tex., when going west, and at Alamogordo going either way, unless he wishes to do recklessly fast driving or be out at night. With the exception of the little postoffice points noted above as gas supply points, all the towns have hotels ranging from fair to good, restaurants, quick lunch counters, etc. In the south plains country the hotels use but one common table, but it is loaded with a bountiful and varied supply of nutritious, well-cooked food. Personally, I have found the beds restful and clean. When away from the railroad a telephone is usually near by. The people have always been courteous to me, and willing to give any information or reasonable assistance.

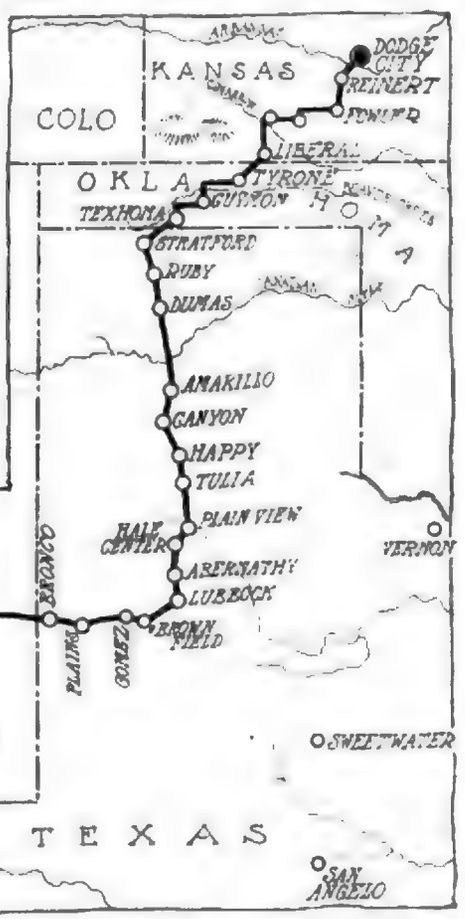
Running Schedule

To give motorists a better idea of the road conditions, I submit the memoranda of my trip a short time since. We did not attempt a time record, but took a steady traveling speed. There were two people in the car, which was a 45 horsepower Imperial. Dodge City to Texhoma, 189 miles, 8 hours; Texhoma to Amarillo, 111 miles, 5½ hours; Amarillo to Brownsfield, 180 miles, 8 hours; Brownsfield to Roswell, 179 miles, 8 hours; Roswell to Alamogordo, 130 miles, 7¾ hours; Alamogordo to El Paso, 99 miles, 6 hours. The average speed figures about 20.49 miles per hour.

I wish now to offer a few cautions for driving in the southwest. On mountainous grades don't kill your motor by pulling it too low on high gear—the intermediate and low gear are installed in cars for use when needed and not for ornamental purposes. Do not court possible disaster or an overstrained motor by trying to see how high your car can climb without shifting gears. Be sure your brakes are in good condition. If inexperienced in heavy mountain driving, such for instance as the drive through the Superstition mountains to the wonderful Roosevelt Dam in Arizona, the observance of these cautions may save your life and also lengthen that of the car.

Road Precautions

From Roswell west to the Pacific, much of the soil of both mesa and valley is of silt or adobe formation and when soaked by heavy rains or overflowed irrigation ditches, becomes very soft and mirey. On approaching such places be careful—usually the firmest footing is the beaten track. This same soil sometimes washes badly when a cloudburst occurs in the mountains and ditches or washes are cut across the road by the rush of the water onto the land below. These washes are often hard to see at any considerable distance so if you are running fast on an unknown road, keep a sharp look-out ahead and be prepared to apply the brakes quickly to prevent breaking springs or perhaps bending the main frame of the car.



MAP OF BORDERLAND ROUTE, SHORT CUT TO SANTA FE TRAIL

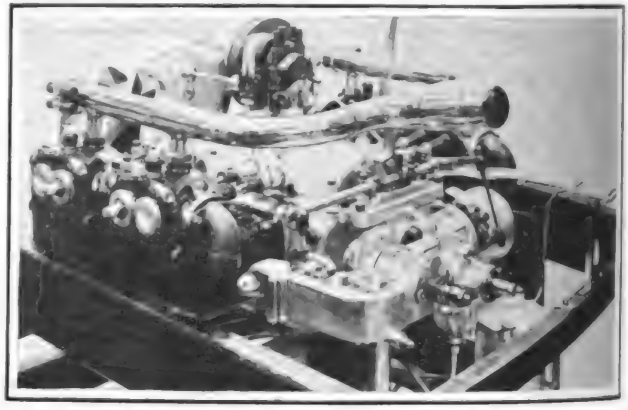
Courtesy Blue Book Publishing Co.

Analyzing the Foreigner at the Olympia

While Lack of Standardization Is Apparent and Specialization in Manufacture of Parts Makes Medium-Sized Cars Expensive, Designers' Ingenuity Is Shown

By George W. Gaidzik

LONDON, Nov. 23—No other motor car show in the world offered so much in the way of originality and ingenuity in motor car design and construction as did the great annual exhibition at Olympia. Lack of standardization and specialization in the manufacture of motor car parts in Europe makes the medium sized foreign car a more expensive proposition than the same class of American machine, but at the same time it has developed the ingenuity of the motor car engineer to a much higher degree than that of the average American engineer, with the result that his individuality is more strongly expressed in each foreign car. The Olympia exhibition, therefore, did not bring out such marked tendencies in design and construction as the great American shows; but there were among the vast number of improvements and refinements to be seen several noteworthy features common to many cars of different make.



A FOUR-CYLINDER OPPOSED MOTOR DEVELOPED BY THE N. ENGINEERING CO. FOR WHICH PERFECT BALANCE IS CLAIMED. THE SINGLE LEVER SHOWN RETARDS SPARK, RELIEVES COMPRESSION AND ADJUSTS THROTTLE FOR STARTING ENGINE BY MEANS OF A LEVER AT THE SEAT

Carbureter Changes

In motors, for instance, nearly all makers have adopted improved facilities for heating the incoming air of the carbureter and provided convenient means of regulating the temperature thereof. Means of warming the mixing chamber of the carbureter and inlet manifold also are generally provided; and dash or otherwise conveniently placed adjustments for changing the proportions of the fuel mixture are to be found in many varieties.

Several cars, including the Vauxhall and Armstrong-Whitworth, warm the incoming air of the carbureter by connecting the main air inlet of the carbureter with the chamber formed by inclosing the valve springs and tappets, the air being admitted to these chambers through wire gauze-covered apertures in the cover plates. As the carbureter generally is on the opposite side of the motor from that of the valves, the air from the valve tappet chambers usually is drawn through a cored passage between the two center cylinders.

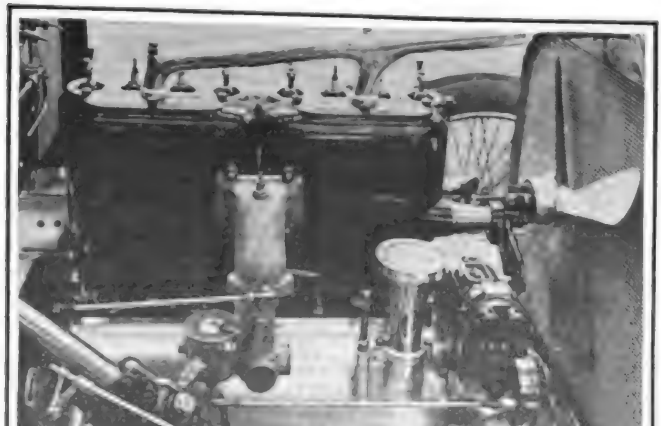
For the purpose of warming the mixture of the carbureter while en route to the cylinders, the Sheffield-Simplex carbureter is attached to a jacketed pipe connection. The openings into this jacket communicate with the exhaust pipe, which is arranged directly above the inlet gas pipe, so that a portion of the exhaust gases are by passed through the jacket of the inlet gas pipe.

Getting Air Pressure

As for the carbureters themselves, the Zenith and Claudel-Hobson seem to be among the most popular on European motors, while many makers still adhere to their own carbureter design and construction. To insure a more positive supply of air pressure to the gasoline tanks, several makers have provided some form of plunger pump in preference to using the pressure of the exhaust gases for this purpose. The Wolseley cars, for example, have fitted a small plunger pump to the side of the motor crankcase which is operated by an eccentric cam on the camshaft. Many American cars have similar pumps for circulating the oil of the motor.

Practically all of the best European motors employing circulating oiling systems provide convenient devices for draining oil from the motor crankcase, and right beside or very near these devices are to be found the gauge for testing the oil level in the crankcase reservoir, and a large getatable filler opening.

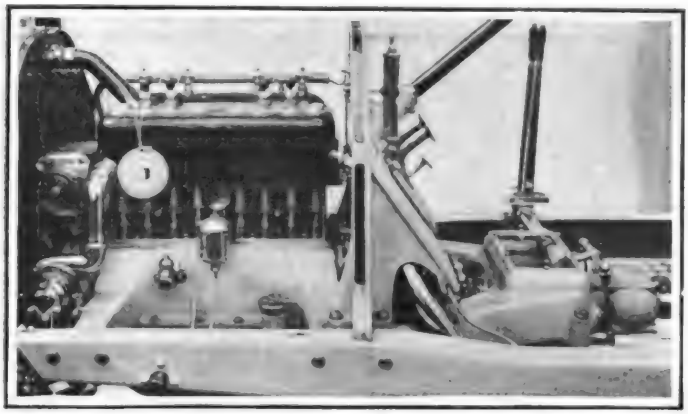
The most popular type of oil gauge comprises a steel rod with graduations near



PICARD-PICTET MOTOR, SHOWING WATER-JACKETED INLET PIPE, CONVENIENT OIL FILLER AND GAUGE, AND LOCATION OF MAGNETO ON TRANSVERSE DRIVING SHAFT. THE CONNECTION AT THE TOP OF THE MANIFOLD IS FOR PRIMING. THE PAN IS MOUNTED ON A SWIVEL BRACKET FOR ADJUSTMENT OF BELT

Latest Mechanical Ideas Discussed

Most European Makers Have Adopted Improved Facilities for Regulating Temperature of Air for Carbureter—Cooling Systems Described—Self-Starting Devices



SIMPLE LINES OF NAZARRO. UNIT GEARSET AND CRANKCASE, WITH CAST ALUMINUM FOOT-BOARD AND DASH BOLTED ON. LIGHTING DYNAMO DRIVE, CARBURETER, AND LOCATION OF OIL-BREATHER-FILLER ON CAR DESIGNED BY FORMER CHAMPION RACE DRIVER

the lower end of it, and a thumb screw at the upper end. The lower end extends down into the oil of the reservoir, and to ascertain the oil level, one has but to unscrew the thumb screw from a threaded hole in the casing, lift out the rod secured to it, and the amount of oil in the reservoir may be readily learned from the oil and the graduations on the end of the rod.

Finding Out Fuel Supply

A similar device could be very easily fitted for the purpose of ascertaining the amount of fuel in the gasoline tank, as many motorists now carry sticks or rulers under their seat cushions for this purpose. Unusually large oil filler funnels have been provided to facilitate the replenishment of the oil supply in the motor crankcases; the Spyker having even gone so far as to fit a long cast-aluminum extension tube to the lower portion of the crankcase, which extends outward from under the side member of the frame.

In the cooling systems of the European motor cars, there are to be found few thermo-syphon systems; but simplicity is a feature of those using pumps; for the pumps are very accessibly mounted; water manifolds are large, simple and direct; and the connections are substantial, but easy to loosen when required. Automatic and adjustable mechanisms for regulating the tension of fan belts are to be seen in many varieties; and the most popular type of belt is a leather linked type mounted between pulleys with V-shaped grooved faces.

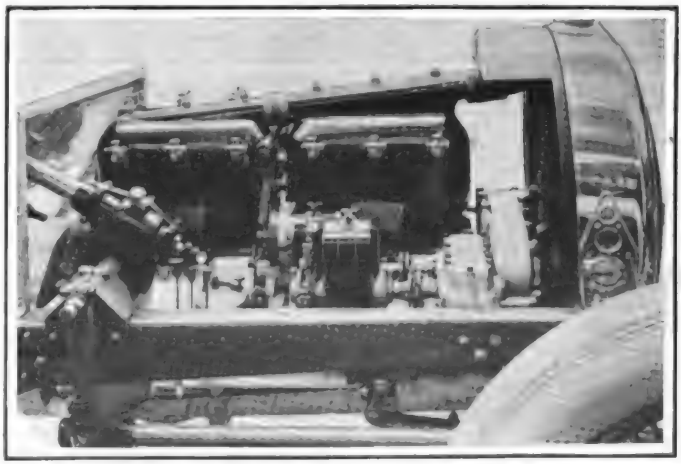
Some of the tension-maintaining devices may be very readily slacked off so that the fan may remain stationary while the motor is running, this is to facilitate warming up the motor on cold mornings. An innovation is to be found on the Wolseley cars in the form of a dirt trap in the lower water connection to the radiator; this consists of a Y-shaped pipe with the lower leg of the Y forming the trap and having a plug at the bottom of it for the purpose of cleaning it.

Many shapes and varieties of the wind-cutting, or sporting types of radiators are shown on the cars on exhibition at Olympia. But popular as these seem to be now, it is hardly probable that the style will become at all permanent, for the only advantage is the wind-cutting qualities, and as this slight advantage is only to be gained at excessibly high speeds it is not worth the extra cost and freakish appearance. However, there are many motorists who find a freakish style attractive. Considerable care is shown in the substantial and flexible means provided for the support of motor car radiators; but America can learn about all that there is in this line from their own manufacturers of commercial vehicles.

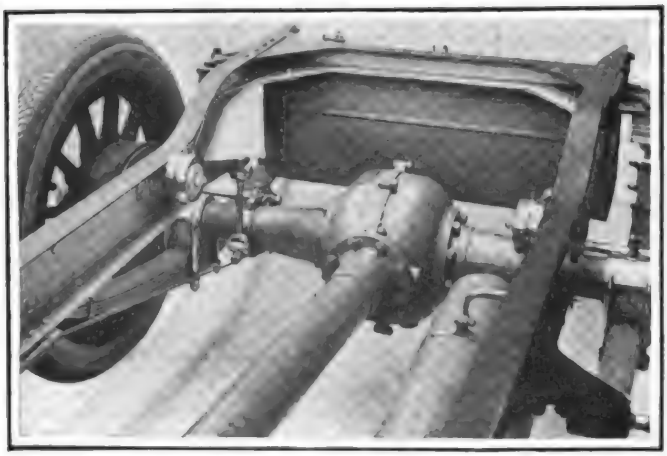
Casting of Cylinders

Practically all four-cylinder motors have their cylinders cast in block; while the six-cylinder motors usually are cast in pairs, but occasionally in threes. There are comparatively few high-powered cars on exhibition; and only a very small number of six-cylinder motors; the latest thing in sixes is the English Daimler Knight engine. Motors generally are smaller than American engines; and the cylinders are mounted on aluminum crankcases suspended at four points from subframes. Chain-driven engine gears are almost universally employed.

Only a few cars with the motor, clutch and gearset combined to form a unit power plant are to be seen; but as this construction is now being employed on such cars as the Belsize, Panhard, Lanchester, and

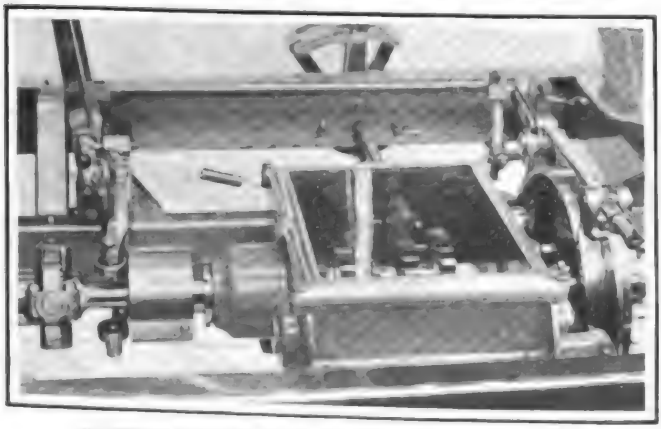


SIX-CYLINDER SHEFFIELD-SIMPLEX. SHOWING STEERING GEAR AND CONTROL LINKAGE AND TWIN LIGHTING AND IGNITION MAGNETOS. ALSO LEAF-SPRING RETAINER OF OIL FILLER. NOTICE THE LEATHER UNVERSAL JOINTS ON MAGNETO AND GENERATOR DRIVES



SHOWING UNIVERSAL JOINTS IN SHOCK-ABSORBER ON BERLIET

REAR SYSTEM OF DELAHAYE, SHOWING PECULIAR BRAKE ADJUSTMENT



VALVELESS DARRACQ—BALL-BEARING WHEEL CLUTCH THRUST

several other reputable makes, an increase in the popularity of this construction in Europe is manifest.

It is surprising to see how few of the European cars are equipped with self-starting devices. Last year's Olympia show marked the introduction of self-starters on the Cadillac and on two English cars, the Adams and S. C. A. T.; and this year there are but four new foreign cars so equipped; these are the Sunbeam, Wolseley, Crossley and Lanchester. All of these except the latter two are of the compressed air type; while electric dynamos are employed for starting and lighting on the Crosley and Lanchesters.

Adams System Described

The Adams system gets its compressed air from a plunger pump mounted at the forward end of the motor and operated by an eccentric and shaft off the end of the crankshaft. The air is stored in a tank placed inside of the chassis frame to the right of the propeller shaft. A push pedal on the dash releases air from the tank and admits it to a distributer on the rear end of the camshaft; and from this device it is carried to the engine cylinders. The Sunbeam air starter is quite different from the usual type in that instead of using a distributer and conducting the compressed air to the motor cylinders, a small vertical three-cylinder air motor is mounted alongside of the engine on the right which is geared to the flywheel like the electric motor of the Cadillac starting mechanism, gear teeth being cut in the face of the flywheel. A separate one-cylinder air compressor mounted on the gear box also is used to compress the air.

The Wolseley system resembles the Adams described above, except that the air compressor is attached to the left front end of the transmission gearbox and driven off the countershaft thereof.

In the Crossley cars, the dynamotor is bolted direct to the engine crankcase, the armature shaft being rotated by a chain. Inclosed in a casing at the rear end of the dynamotor is a planetary gear, which gives a reduction of 20 to 1 for starting purposes. The dynamo is differentially wound for generating current, the shunt winding of the field magneto being excited off the batteries when the charging switch is closed. Current is taken from a set of batteries consisting of twelve cells and giving 24 volts.

Single-Lever Control

A single-control lever serves to apply a band brake to hold one of the members of the planetary gear still and to switch on the current. When the engine has started, the control lever is released, the band brake is freed, and the machine is connected as a dynamo, so that when the engine speed exceeds the armature speed it becomes a generator of current for restoring the supply of current in the batteries. The batteries are coupled in four parallel groups of three cells each for lighting, and give a total capacity of 80 ampere hours at 6 volts.

The Lanchester electric lighting and starting outfit also employs a dynamotor suspended from about the center of the chassis frame to the right, and its armature shaft is brought into communication with the propeller shaft of the unit power plant by chain and sprockets. It is a Delco system like that of the Cadillac, and is not standard equipment as yet. The White and Cadillac were the only two American cars on exhibition equipped with self-starting mechanisms, and, of course, these also are of the electric dynamotor design.

Mounting Lighting Dynamos

A notable feature of car design evident in a number of the new models is the provisions for mounting and driving lighting dynamos. Improvements in car illuminating systems in general are much in evidence, which show that electric lighting, through its increased efficiency and all around convenience has gained considerably in favor.

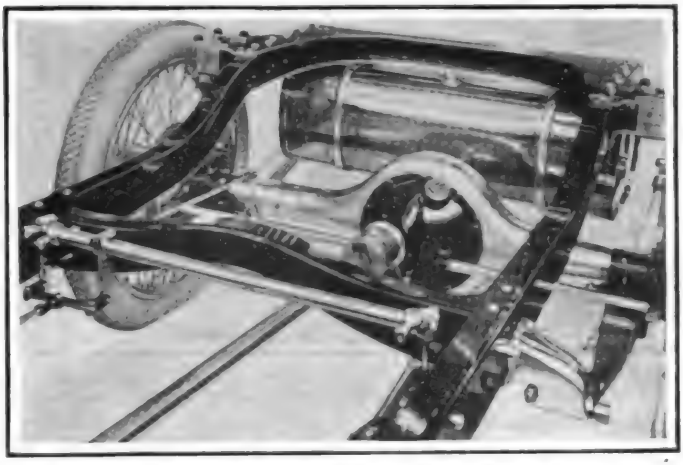
The dynamos of these systems generally are driven by V-shaped leather link belts from a pulley either on the crankshaft or camshaft of the motor; but one maker has a pulley incorporated on the face of the clutch casing which drives a generator arranged directly above; while others suspend the dynamos to one side inside of the chassis frame and drive it by belt from the shaft between the clutch and gearset, or from the propeller shaft just behind the gearset.

There also is a tendency toward the driving of speedometers by belts from the propeller shafts, instead of from the front wheels. It is a simple method, and there should be no reason why it should not be just as accurate. As long as the front-wheel speedometer drive is retained, however, motor car manufacturers might do well to follow the example of one foreign maker and bring out a steering arm on the driving side of the car with a separate lug having a hole in it for the attachment of the speedometer pinion-shaft holder.

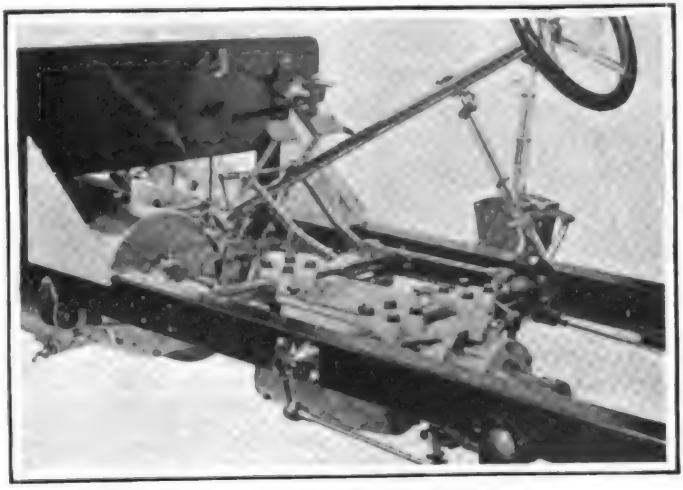
Clutches of many varieties are to be seen on the cars at Olympia, but the cone type still is holding its own. There is a general tendency toward the thorough protection and lubrication of all clutch-operating mechanisms; and facilities are usually provided for the convenient removal of the clutch without disturbing the gearset or other units. Clutch brakes are almost universally fitted, and most of them are simple and effective in design.

Varieties of Clutches

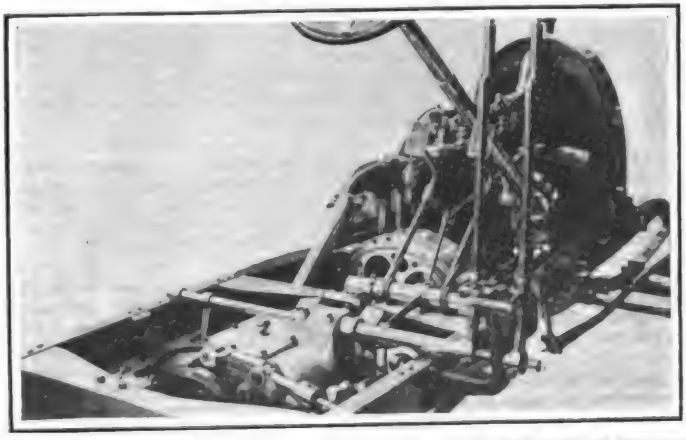
Universal joints or flexible couplings of many ingenious patterns are to be found between the clutches and gearboxes. The coupling between the leather-faced cone clutch and four-speed gearset of the Unic car is quite interesting; it comprises a pair of large leather disks secured to spiders on the ends of the clutch and gearset shafts which not only allow for slight relative misalignment of these shafts, but also provides for the longitudinal movement of the clutch shaft when



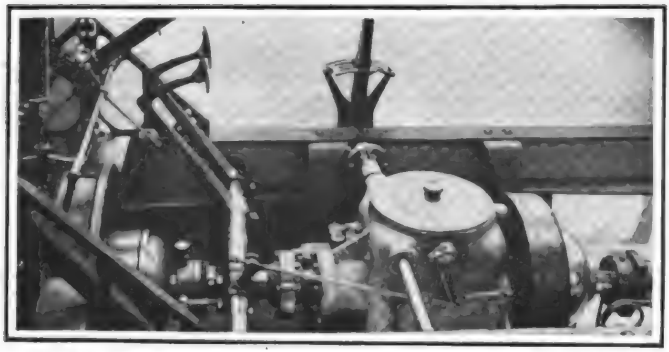
SIMPLE BRAKE-ROD CLEVIS THAT IS FOUND ON THE PICARD-PICTET



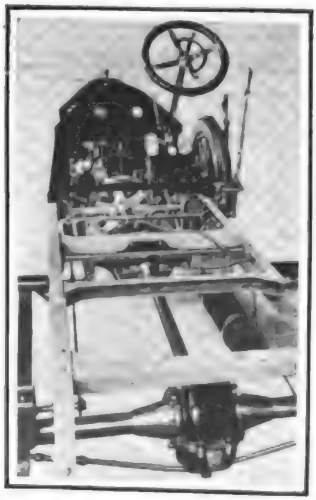
PHOENIX-PEDAL ADJUSTMENTS AND CLUTCH BRAKE



N. A. G. USES EXCEPTIONALLY LONG PEDAL ARMS, FITTED WITH HEAVY SPRINGS



SHOWING BERLIET OIL LEADS TO GEARSET, UNIVERSAL, AND TORQUE TUBE BEARING, AND CONVENIENT ADJUSTMENT OF GEARSET-INCLOSED BRAKE



SHOWING HOSE CONNECTION FROM EXTERNAL OIL CUP TO TORQUE TRUNNION ON THE VINOT

engaging and disengaging it. The Vermorel car also is interesting in this respect in that it employs two couplings between the clutch and gearset; one of these comprises a number of laminated spring plates which are designed to flexibly absorb the shocks between the motor and transmission mechanism; while the other coupling is an inclosed dog and groove design of the oldham type.

There is a tendency toward the use of four-speed gearsets on the medium weight cars, but this no doubt is due to the fact that as a rule the engines are comparatively much smaller than those to be found on the average American car of similar size. Tiny motors on large chassis are quite common. In order to increase the efficiency and noiselessness of transmission gearsets, the cases are very substantially mounted, and in such a way as to be free from strains that might be brought about by twisting of the frame; while every precaution has been taken to eliminate all stresses due to the slight misalignment of the shafts communicating with the shafts of the gearset. Facilities also have been provided to insure lubrication, and to render the transmission gear unit easily and independently removable from the chassis.

Noise-Reducing Features

In the way of noise-reducing features, the Baguley car employs a pair of helical gears for the first speed. Other makers have endeavored to keep down the noise of their gearboxes by means of careful design, short, stout shafts mounted on substantial anti-friction bearings, and adequate lubricating facilities to reduce wear. An innovation is to be found in the Adams gearbox in the form of a small vent pipe designed to equalize the air pressure on the inside of the case with that of the atmosphere, and thereby prevent the leakage of oil from the case. It is reasonably claimed that internal air pressure produced by the heat generated inside of the case when in operation at high speeds, is the cause of most of the oil leakage from the motor car gearcase.

Several cars are provided with oil leads to the transmission gearcases, whereby the oil supply therein may be readily replenished, while the car is in operation if desired, by operating a small pump on the dash. Many makers have endeavored to facilitate lubrication of the gearset mechanisms by fitting unusually large and conveniently removable cover plates.

The European style of mounting a brake on the rear end of the transmission gearset is strenuously adhered to; and many ingenious arrangements for its operation, adjustment, lubrication and air cooling are to be seen. The inclosure of the propeller shaft in a torque tube is a popular practice, but there also are many adherents to the exposed propeller shaft and separate torque member design. Universal joints at the front ends of propeller shafts are generally very substantial in construction, and thoroughly inclosed and lubricated. The hollow steel ball joint is very popular, but the practice of supporting the forward end of the torsion tube in a large yoke which is hinged to a cross member of the frame, also is to be seen on many cars. Several makers have fitted oil leads to the universal joint casings at the forward ends of the propeller shafts; while one or two have even gone so far as to fit a long lead along the torsion tube which conducts oil to the driving pinion-shaft of the rear axle.

A notable feature of rear axle design is the symmetrical form of rear-axle gear housing employed on the great majority of European cars. These cases have a very much neater appearance than when one side of the case bulges out to make room for the differential gear or is offset to support the driving pinion, and the improvement is simply brought about by mounting the large bevel gear ring to one side and allowing the driving pinion to enter the center of the large gear casing. Several examples of these cases are to be seen in the accompanying illustrations.

Another practice which is almost universal abroad, and in which most American cars have been sadly lacking, is that of providing convenient facilities for replenishing the oil supply of the rear axle cases. Many cars are using fluid oils for the lubrication of their rear axles in preference to the non-fluid greases generally employed heretofore, and in order to avoid the introduction of excessive amounts in the rear-axle cases, means are provided to indicate the oil level therein. The de Dion car has a test plug in the side of the bevel gear housing at a height of about 3 or 4 inches from the bottom; and in order to facilitate draining the rear-axle case, the Swift car has fitted a little thumb-screw vent-plug in the top of the case.

Location of Gearsets

Only a few cars are to be seen with transmission gearsets combined with the rear axle housing; in fact, the only one that the writer noticed was that of the H. L. car. This is a new car of comparatively light weight, and its sliding gearset which gives two forward speeds and reverse, is so small and compact as to require hardly more room than the differential mechanism; and as these two mechanisms are mounted on opposite sides of the large bevel driving gear, the whole rear axle housing is so small and symmetrical that a casual observation of the chassis causes one to wonder what has been done with the gearset.

Worm drive is now being used on many of the foreign cars. As for the position of the worm above or below the axle, opinions of the designers seems to be about equally divided, with the above position slightly in favor. The chief innovation in the design of rear axles is confined to an extension of the modern desire to conceal those parts that cannot be dispensed with; and by arranging all parts symmetrically. It is surprising to note the number of cars having axle casings which must be completely dismantled be-

fore any alterations or adjustments can be affected. There can be but little doubt of the advantages of these types of axles in which the differential and main bevel can be removed from their bearings directly the main cover of the housing is removed.

An unique feature in rear-axle fitttings is to be found on one of the Arroll-Johnston cars in the form of a compensating device which is claimed to greatly improve the riding qualities of the car by eliminating the rolling motion characteristic of cars having elliptic rear springs.

Brakes are an important feature of the European car; and many clever arrangements in brake design and construction are on exhibition. In this respect it might safely be said that the European cars are far superior to the average American product. This of course is due to the necessity for very efficient brakes to negotiate the very long grades that exist in some of the foreign countries. Coil springs, with one end anchored and the other end straightened out into a long arm, are very extensively used on brake levers for the purpose of holding them in a released position so as to prevent dragging of the brakes.

Simple Brake Adjustments

There is a general tendency to provide very simple and convenient adjustments which can be operated by hand and without the use of any tools. Great simplicity also is exhibited in the arrangement of brake control mechanisms; and many cars have managed to do away with many rods, shafts, arms, etc.

For example, it was noted on the Martini chassis that a single long brake rod is arranged directly over the propellor shaft. This communicates directly between the pedal shaft and a clevis over the rear-axle pinion, which in turn equalizes and transmits motion to arms on the brake shafts. A very accessible thumb-screw adjustment is provided at the forward end of this long rod; and it was noticed that the movable connections are all high up and fairly out of range of dust, mud and water. The Motobloc, Zedel, and Dennis cars also have similar brake rod and clevis controls.

Ribbed brake drums, on which the ribs, flanges, or fins are employed to strengthen and keep down the temperature of the drums when on long steep grades, are very extensively used. Practically all brakes are of the internal pattern; and as most cars have the emergency hand brake on the transmission shaft, only one set is fitted to the rear wheels. Many reputable makers, however, are using both brakes on the rear wheels, and it is claimed that the tendency is in this direction. Some cars have two expanding brakes of equal diameter arranged side by side on the same drum, others two drums of different diameters; but the use of an external and internal brake on the same drum is not so popular. There are but a very few cars with external contracting brakes on the rear wheels. Front wheels brakes are only to be seen on the Argyll and a large racing type of Isotta-Fraschini. Cable is still quite extensively used instead of rods on French cars; while the Panhard uses flat steel ribbons with adjustable end pieces. These are supported in about the center of their length between two fiber rolls mounted in a bracket under a cross member of the frame; this is to prevent excessive whipping and vibration.

LENTZ OIL TRANSMISSION ON CHARRON CAR, SHOWING SPRUNG DRIVING UNIT, WITH TRANSVERSE CARDAN DRIVE, AND DEAD REAR AXLE

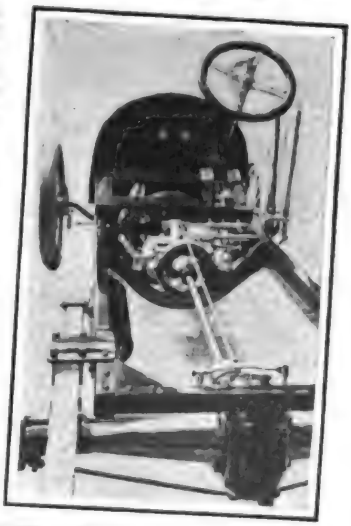
Underslung chassis springs are very popular on foreign cars this year and are to be seen on such cars as the Brazier, de Dion, Mors, Sheffield-Simplex and many others of reputable make. An interesting feature in the spring design is to be seen at the front end of the H. L. car in which the steering spindles are mounted in a telescopic tube which contains a coil spring.

Only small detailed refinements are to be found in the steering mechanisms which are also to be found in those of American cars, while the endeavors to clear the dash of gauges, switches, etc., has succeeded practically to the same extent as on the American car; gauges and switches there are, but these are of a construction that promote cleanliness, and they are arranged in a neat and convenient fashion by the designers.

Cast Aluminum Dashes

Cast aluminum dashboards are becoming popular in Europe, and are used on Rolls-Royce, Napier, Sava, Nazzaro and others. The scuttle type of dash is almost universally employed and the Austin torpedo touring car has gone so far as to provide a curved glass windshield which is practically a continuation of the metal portion of the scuttle dash.

Many little interesting details of body construction and design are to be seen, while the accessory manufactories have brought out numerous fittings and devices to add to the convenience of the motorist. Where scuttle dashes are employed several body makers have provided glass windows which provide illumination for the gauges and mechanisms underneath and others have accomplished the same results by



MARTIN SINGLE-ROD BRAKE LINKAGE, WITH SIMPLE CLEVIS

fitting a large wide hatch along the top of the scuttle dash which may be open either to admit air or light.

Cocoa matting is very popular for covering the floors both in front and behind the front seats, and pads of it are placed on the running boards opposite the doors so that passengers may wipe their feet thereon before entering the car.

One type of car has provided a set of brushes arranged under the running boards so that the passengers may wipe their boots upon them before stepping into the car. An interesting innovation in limousine boiler construction was seen at one of the stands. It comprised a large opening in the top which is covered by a sliding hatch. It may be readily opened to admit sunlight or air, while it is possible by standing up in the limousine to look out over the roof of the car. This latter feature should facilitate the use of this type at race and aviation meets.

The Readers

Tires of False Standards

Reader Suggests a Partial Substitute for Theoretical Ratings Adopted by Offical Boards

FRANKFORD, PA.—Editor Motor Age—I have read with interest the discussion of horsepower formulas in Motor Age, but it seems to me that all of them are more or less inaccurate, and that the only way to find out the true horsepower is to test the motor. It would be a good plan for the Society of Automobile Engineers, or some other association, to conduct horsepower tests of the different motors. At the present time a manufacturer can claim any horsepower for his motor he wishes. For instance, one car with a 4⅞ by 6-inch motor is advertised as 40-horsepower, while another, only 4⅝ by 4½, is advertised as 45-horsepower.

2. What are the cylinder dimensions of the Jay-Eye-See, Blitzen Benz, Christie, Grand Prix Sunbeams, the six-cylinder Sunbeam which made 907 miles in 12 hours last year, the 300-horsepower Fiat, Grand Prix Peugeots, and the 300-horsepower Benz, which Burman is now driving?

3. What is the make of the Jay-Eye-See?

4. What is the largest motor ever put in a racing car?

5. What is the largest stock motor built abroad?—A Reader.

1. You are not alone in this opinion, as the need of accurate horsepower standards has been urged repeatedly by Motor Age and others. The ratings of motors by manufacturers is uncertain at best, as, if the S. A. E. standard is adhered to the makers of long-stroke and otherwise high-efficiency motors are at a disadvantage, while brake-test ratings are subject to variances of the normal speed of a motor and to the reliability of the manufacturer. Your suggestion that the S. A. E. or some other association take up the matter earnestly and conduct tests of standard motors is a good one. It might be elaborated to contemplate brake or dynamometer tests of all standard motors at the discretion and expense of the manufacturer, publishing the results, as the standard rating. These tests could be carried out under exactly the same conditions, say at a uniform piston speed, with the same grade of fuel, the same temperature, etc.

2. These dimensions follow:

Car—	Bore		Stroke
Jay-Eye-See	9¾	x	8⅝
Blitzen Benz	7¾	x	9¾
Christie	7½	x	7
Grand Prix Sunbeams	...		...
Six-cylinder Sunbeams	...		...
300-horsepower Fiats	5¼	x	7⅞
Grand Prix Peugeots	...		...
300 Benz	7¾	x	9¾

3. The Jay-Eye-See is a Fiat chassis rebuilt with a special body by its owner, Louis Disbrow, and his brother, at his Jamaica, Long Island, home.

4. The Jay-Eye-See motor, it is believed, is the largest that has ever appeared on a race track. It is one of the original 300 horsepower Fiat motors.

5. This is hard to answer, due to the extremely flexible meaning that is attached to the term stock abroad, and to the fact that publicity in Europe is not as searching as in America, so that manufacturers frequently produce special models as stock, without the public being informed of it. The largest motor shown at Olympia was a Benz, which was 7¾ by 7⅞ inches, bore and stroke, of four cylinders, which was rated by the makers at 200-horsepower.

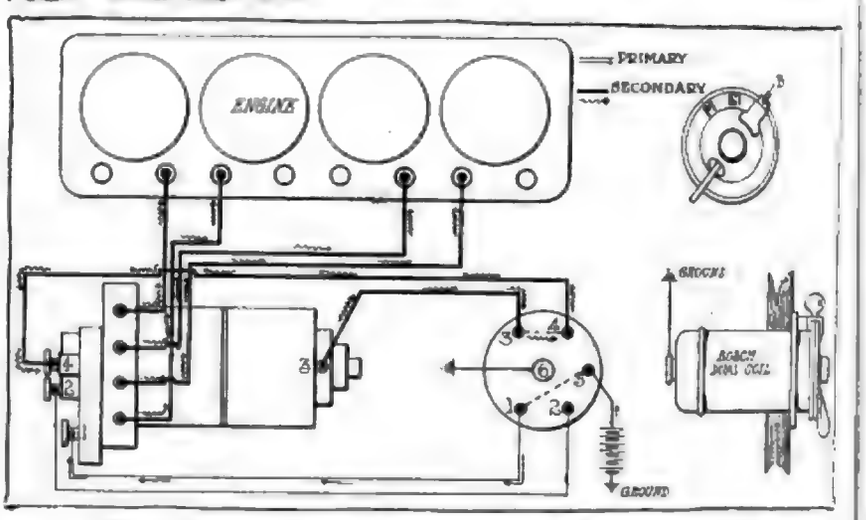


FIG. 1—BOSCH DUAL SYSTEM—CIRCUITS IN BATTERY POSITION

DUAL AND DOUBLE IGNITION

Chicago—Editor Motor Age—On the six-cylinder 48 horsepower 1913 Packard Bosch dual ignition is used as well as battery; and on the four-cylinder 1913 Marmon the makers use the Bosch dual multi-point ignition, also battery.

Can Motor Age show by rough diagram the flow of current through the various metallic connections for both systems on each make of car, from its origin until it reaches the spark plugs? I would also like to have shown the interior connections of the single-unit coil and the flow of current, when the coil switch is on magneto and when on battery. I would like to know how the extra switch on the Marmon is wired up with the coil. Please show the connections of magneto primary and secondary wires. Explain how better on face of coil creates a vibrating and non-vibrating spark.—E. S. V.

The Bosch dual system is illustrated in the three switch positions in Figs. 1, 3 and 5. The arrows indicate the direction and progress of the current through the system. It will be noticed that the direction of flow is reversed for convenience's sake. Fig. 6 shows the two spark plug system, operating two sets of plugs from the magneto, or in normal running position. Figs. 2 and 4 illustrates the flow of the current when operating on one set of plugs from the magneto and from the battery. Fig. 7, illustrates the interior of a Bosch single-unit coil. The start

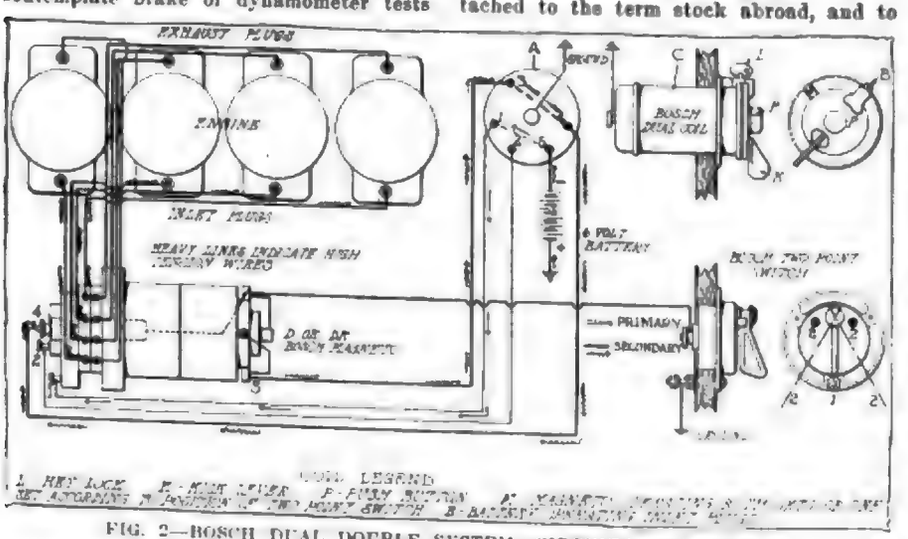


FIG. 2—BOSCH DUAL DOUBLE SYSTEM—CIRCUITS ON BATTERY

Clearing House

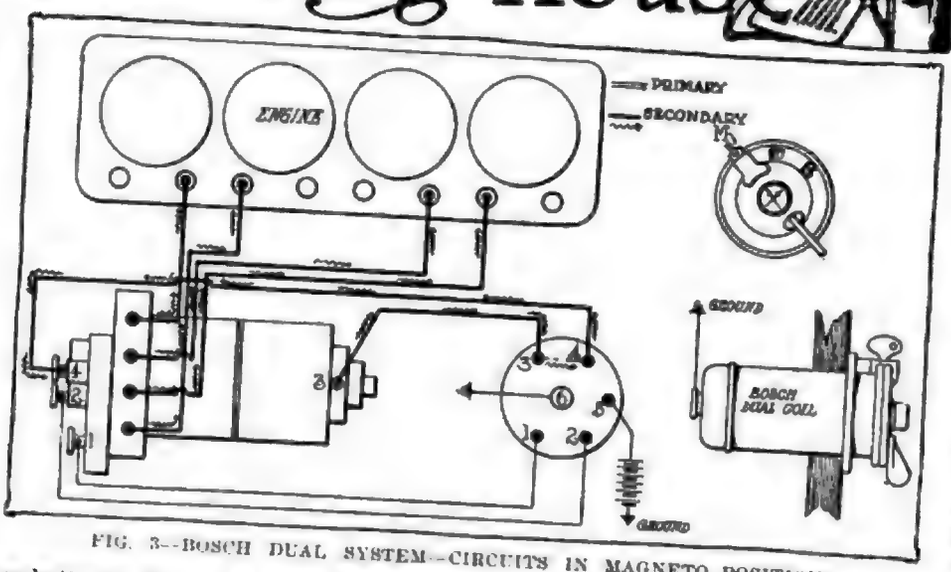


FIG. 3—BOSCH DUAL SYSTEM—CIRCUITS IN MAGNETO POSITION

ing button on the coil for starting cuts the vibrator into the high-tension circuit of the magneto, and induces a spark of great intensity, but of sluggish speed, ideal for starting, but having too much lag for high-speed work; and when not in action, the vibrator is out of the circuit.

PRESSURE AND COOLING

Clarion, Ia.—If gas, such as is exploded in a motor cylinder under normal conditions, was exploded in an air-tight chamber, how long would the pressure be maintained? Does the pressure reduce as the gas cools or does it subside immediately as soon as the burning process is finished? Please answer in detail.—F. S. Thornley.

1—Assuming an air-tight chamber, after combustion the pressure within would subside to a certain extent, owing to the radiation of heat through the walls of the vessel. When the gas within reached atmospheric temperature, assuming the latter as a constant quantity, the pressure will have reached its minimum. This would be slightly higher, though, than, atmospheric pressure, as the products of combustion are lighter than air, that is of less density, and would hence be under greater pressure at a given temperature than the atmosphere. To gauge this accurately, would be quite impossible, as the radiation would proceed at a rate inversely proportional to the degree of pressure reduction produced by such radiation. This variable, in turn would depend upon the rate of radiation, which would be affected directly by the conductivity of the material of which the vessel was made. Theoretically, therefore, the process never would be quite complete, in accordance with the law that variables approaching the same limit may never reach it, however finely they may be divided. Practically, this would probably take years in a room of uniform temperature.

But another practical feature enters into this. This is the fact that no material ever has been discovered that is air-tight. Glass and gold, two of the closest-grained materials known, have been formed into hollow, closed spheres, and cast into several fathoms of sea. After something like a year they were recovered, and found partly filled with water. Assuming, however, an ideal material that was totally impervious, surrounded by a perfect vacuum, the pressure generated within a closed vessel, would not diminish after combustion. However, as such a material is inconceivable to the scientific mind, as it is physically impossible to utterly surround a stationary body, as a perfect vacuum never can be attained, and as no material would be strong enough to sustain the enormous pressure incident to such a vacuum, the pressure in any closed vessel will diminish after combustion, at a rate commensurate: 1—with the conductivity of the material; 2—with its porosity; 3—with the atmospheric temperature and 4—with its heat-absorbing ability.

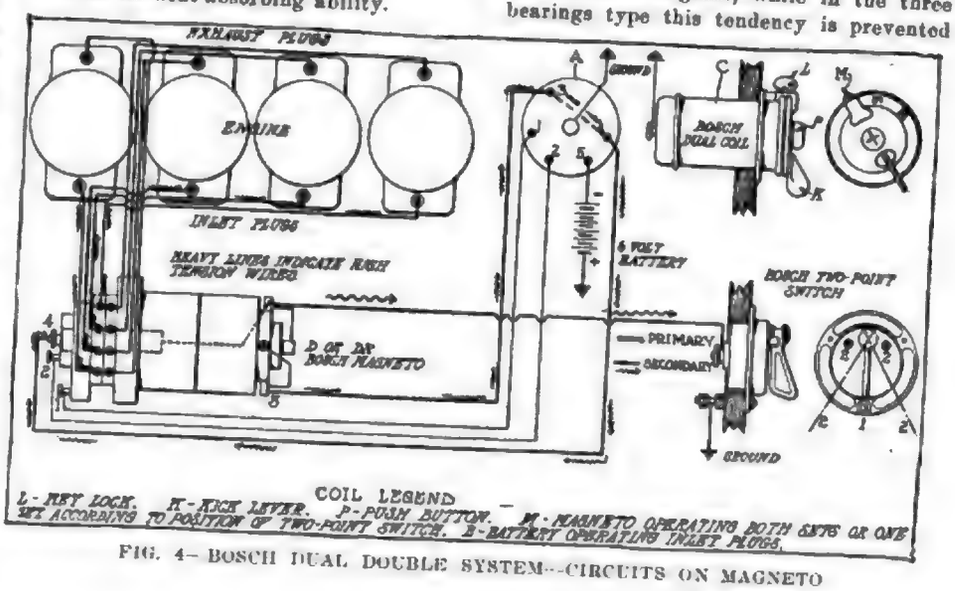


FIG. 4—BOSCH DUAL DOUBLE SYSTEM—CIRCUITS ON MAGNETO

On Number of Bearings

Comparison of Advantages of Three and Two Bearings on Main Engine Journals

WAKEFIELD, Mass.—Editor Motor Age—What is the maximum speed of a 1913 R. C. H. touring car?

2—Has Motor Age published a description of the R. C. H.? If so, when?

3—Which is generally supposed to be better, the two or three-bearing crankshaft?

4—Tell how gasoline and spark are supplied to rotary motors, and what their advantages are.—G. W. Butterfield.

1—These cars should be able to make 45 miles per hour.

2—The 1913 R. C. H. was described in the issue of Motor Age of July 4, 1912.

3—Formerly the preferences of buyers was for a plurality of main bearings, but in late years with the growth of the light-weight, simple, and low-priced car, has come the development of the two-bearing idea, so that now the balance of popularity is about even between the two. The two-bearing engine is the result of the aim of engineers to combine high efficiency with simplicity, light-weight and compactness. It had its birth practically with the monoblock idea. It was considered imperative in casting four cylinders in one piece to bring their centers as close together as possible, so that little space was left for a third bearing between the two middle cylinders. The distance between the two end-bearings was so shortened by the elimination of this extra length that two bearings were found sufficient to support the shaft. The objections that have been offered against two-bearing crankshafts are that the bearing surface is not usually as long as with the three or five-bearing type, and therefore the strain on each bearing is correspondingly greater; that owing to all of the piston thrust being taken on the shaft between two bearings, the tendency of the shaft to whip between these points is great, while in the three bearings type this tendency is prevented

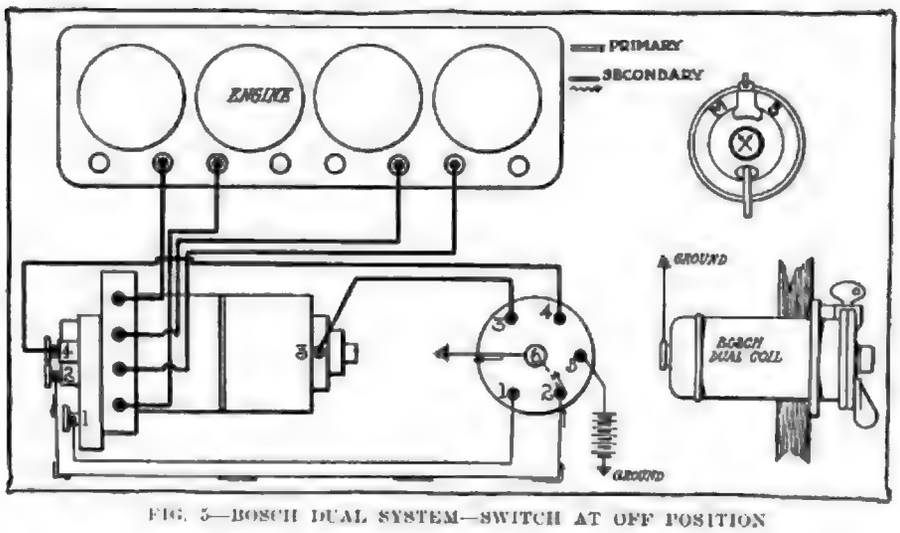


FIG. 5—BOSCH DUAL SYSTEM—SWITCH AT OFF POSITION

by the presence of the center bearing. Looking at the question from both sides, it is to be admitted that these points are valid, but on the other hand, there is less danger of faulty alignment with two than three bearings. While the lessened bearing length may require more frequent adjustment of the bearings on the two-bearing engine than on one with a greater number, these adjustments may be more easily made than where a bearing is crowded in between the crank-throws. While it is not practicable to make the bearings of a two-bearing crankshaft as long as those of the three-bearing type, they may be made larger in diameter, and hence of the same surface-area. The crankshaft may be made shorter and more compact, and therefore stronger than where its length must be increased by the length of another bearing, and the center throws may be included in one crank angle, no return to the center being necessary, as with the three-bearing type, thus permitting a lighter and stronger crankshaft construction. However, while it may be concluded that the three-bearing type has no advantage over the two-bearing type in use on four-cylinder block motors, provided both are equally well designed and well balanced. Motors of this type with three bearings can hardly be said to be at a disadvantage with the simpler type though, and it is this, that undoubtedly accounts for the absence of a decided preference for either type. There can be no doubt, however, of the superiority of the three-bearing type over the two-bearing type on motors whose cylinders are cast in twos or singly. In fact it is thought by some that motors whose cylinders are cast singly always should have five bearings.

4—Gas is supplied to the cylinders of a rotary cylinder motor through a manifold in the form of a ring about the crankshaft, which revolves with the cylinders, and from which pipes lead to the inlet valves of each. Gas is taken into this ring through a passage in the crankshaft, opening into the manifold, or through a stationary half of the ring. The ignition distributor revolves about a stationary brush, individual wires leading to each spark plug. The advantages claimed for this type of motor are lightness, due to its compact construction, practicability of air cooling, due to the positive movement of the cylinders through the air, perfect balance, due to the balancing of all revolving parts, and the stationary crank. In explanation of this last, it must be remembered that bad balance in the usual type of engine is the result of the reciprocatory motion of the pistons and cranks, while in the rotary motors the pistons revolve about a stationary crank-pin, while the cylinders revolve about main journals, eccentric with the crank-pin. It is this freedom from vibration and lightness that has made this type so popular with aeronauts.

PURPOSE OF GLYCERINE

Sioux City, Ia.—Editor Motor Age—Kindly advise why glycerine is used in an anti-freeze solution, such as was published in Motor Age, issue October 17.—Curtis Sash & Door Co.

Glycerine freezes at a lower temperature than alcohol, and is therefore a better resistant of cold. It is injurious to rubber, however, and for this reason it is not used in strong solution. Pure alcohol has the disadvantage of evaporating rapidly and as it freezes at a higher temperature than glycerine, more of it must be used with water to make a successful anti-freeze. By combining the two, a greater proportion of water may be used than when pure alcohol is used, and the small amount of glycerine employed does not seriously endanger the rubber connections. Such a solution will not evaporate as rapidly as will one employing only alcohol it was

MISSING ON TWO CYLINDERS

Clarinda, Ia.—Editor Motor Age—I have a four-cylinder, 35-horsepower car of this year's model, which has suddenly developed a peculiar missing. The car is equipped with a Bosch magneto and misses on cylinders 2 and 3 at all speeds, and hits as well as ever on cylinders 1 and 4. There is no spark at 2 and 3 whatever while 1 and 4 have a strong spark. The wires are in good shape, also the plugs. What is the remedy for this trouble?—L. H. Regal.

There are a number of causes besides defective wiring and plugs that may cause two cylinders of a motor to miss and two to fire regularly. The magneto itself, must be in proper order or you would not get a spark on cylinders 1 and 4. Look at your distributor and see that the contacts are in good order. It is possible that the distributor brush is worn so that it only contacts on two of the four points. These points may also have become grounded to the metal parts of the distributor. Dirty contacts frequently are the cause of misfiring. Do not be too certain, however, that the plugs are not defective. Try other plugs that are known to be in good condition and see if they will not spark. See that your sparking points are not too wide. Look carefully to your high-tension wiring. See that the insulation is intact, and that the connections are tight.

THE METALLURGIQUE CAR

Evansville, Ind.—Editor Motor Age—Why were the Marquette-Buicks disqualified at the 1910 Indianapolis speedway races? Allowing for the usual change

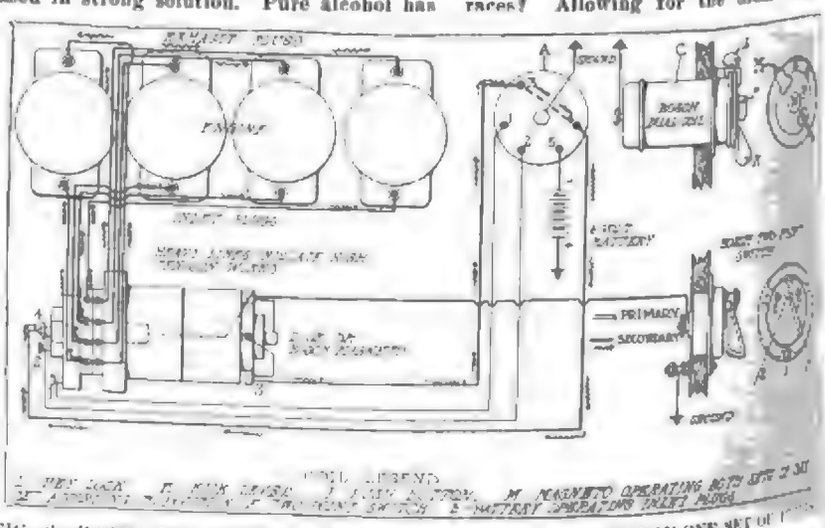


FIG. 6—BOSCH DUAL DOUBLE SYSTEM—MAGNETO SPARKING ON ONE SET OF PLUGS

in the make-up of racing cars, what were the other differences?

2—What is the price of the Metallurgique?

3—Where is it made?

4—What horsepower has it?

5—What does the average race driver do during the winter months?

6—What is the record run between Indianapolis and Chicago?

1—There were no Marquette-Buicks entered in the Indianapolis race of 1910.

2—These cars are listed below:

H. P. S. A. E.	Bore and Stroke	Price in Europe
13.9	3 by 3⅞	$1,350
15.8	3 1/16 by 5½	1,925
20.1	3 3/16 by 5½	2,475
20.1	3 7/16 by 5½	2,625
25.8	4 by 6	3,125
25.8	4 by 6	3,475
38.8	5 by 6	4,375
38.8	5 by 6	4,625

3—The Metallurgique is made in Belgium.

4—Please refer to the above table.

5—This is a matter purely personal to themselves. They do everything from touring abroad to working in the shops of their employers.

6—none is recorded.

7—Another meet is planned, and present indications appear favorable to the running of at least one race at the Cream City.

COOLING THE MAXWELL

New Haven, Conn.—Editor Motor Age—I have a model Q Maxwell purchased just 2 years ago. It requires from 4 to 8 gallons additional water to every 20 miles with the shade temperature at 70 degrees or more. Is the radiation of this car sufficient for hilly country? Would it be of any help to add a pump? I use soft rain water, have cleansed with sal soda twice, renewed all rubber connections flushing well at the time; there are no signs of scale, the fan works, there are no cold spots on the radiator, have cleaned the cylinders, used Vacuum, French motor, and Polarine oils in varying amounts, valves and ignition seem to be correct, and adjusted the carbureter and weakened the mixture until there is no power on high. What is the trouble and the remedy?—C. F. Goodrich.

The fault is not with the design of the car nor its radiator. Overheating such as you describe must be the result of lack of driving skill or some abnormal condition in the adjustment or state of repair of the car. A pump is not necessary if the motor is working properly and the cooling system is in repair. To add a pump to a crippled motor would not remove the cause of the trouble, and would therefore only delay the day of final reckoning, even though it might temporarily relieve the condition. If you are sure of your diagnosis as to the working order and cleanliness as outlined above, it is quite likely that your difficulty is with your weakened mixture. Readjust your carbureter for the greatest power at all speeds and leave it alone. The chances are that better cooling will result. If it does not improve matters your trouble is more deeply seated than this. No motor will overheat because of a normally rich mixture. To adjust the carbureter to either extreme, however, will produce overheating, especially if the mixture is made over-rich. As to the valves and ignition, whether or not they are as they should be can only be determined by giving them a careful test and inspection. Consult a valve-timing and spark-timing formula in this and test your motor for timing by having some one turn the motor over slowly, with the petcocks open, and noting when the valves open in number one cylinder, comparing these openings with the marks on the flywheel, if there be any, and with the position of the piston, if there be none. In the same way test the spark timing. Lay number one spark plug on the cylinder and see that it sparks not later than one or two degrees past dead center on full retard and well before dead center on advance. Test your water circulation by putting aniline color in the radiator, and noting the length of time required for it to get to the disconnected cylinder outlet pipe. Look at your clutch and see that it is in good condition. Set your brakes, and with the motor running, observe whether the clutch engagement kills the motor or whether the clutch slips. It is naturally assumed that you have tried carrying your spark advance a trifle higher in operation. The oils you are using should satisfactorily lubricate the engine if your lubrication system is right. Feed enough oil at first to smoke and then cut down to a point where the smoking ceases, and no farther. If the engine formerly cooled properly, the cause must be in defective adjustments or a temporary derangement, while if it never did cool properly, the engine must be defective.

NOTICE TO CORRESPONDENTS

Motor Age has received communications addressed to the Readers' Clearing House from the following named towns and nom de plumes:

Regina, Sask.—A Beginner.
Oakland, Cal.—J. A. H.
Neche, N. D.—Subscriber.
Strong, Colo.—A Subscriber.
Jefferson, Wis.—A Reader.
Harvey, Ill.—B.
Milwaukee, Wis.—Reader for Years.
Oak Grove, Ala.—A Subscriber.
Milwaukee, Wis.—A Milwaukee Chauffeur.
Canton, Miss.—Subscriber.
Indianapolis, Ind.—E. E. J.

These communications will be held until the proper signatures have been received. All communications written over a nom de plume must bear the writer's signature, otherwise such communications will not be answered. These signatures are wanted as proof of the authenticity of the inquiries.—Editor Motor Age.

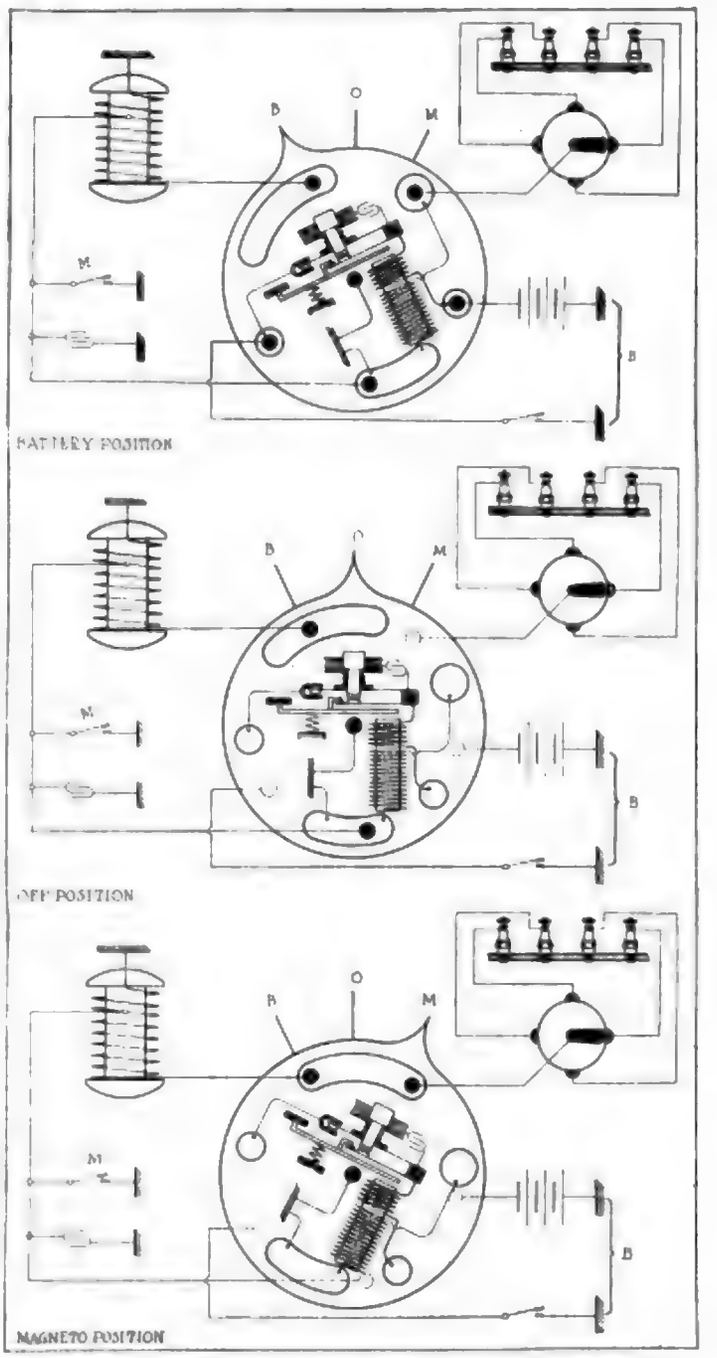


FIG. 7 INTERNAL CIRCUITS OF BOSCH SINGLE UNIT COIL IN THREE-SWITCH POSITIONS

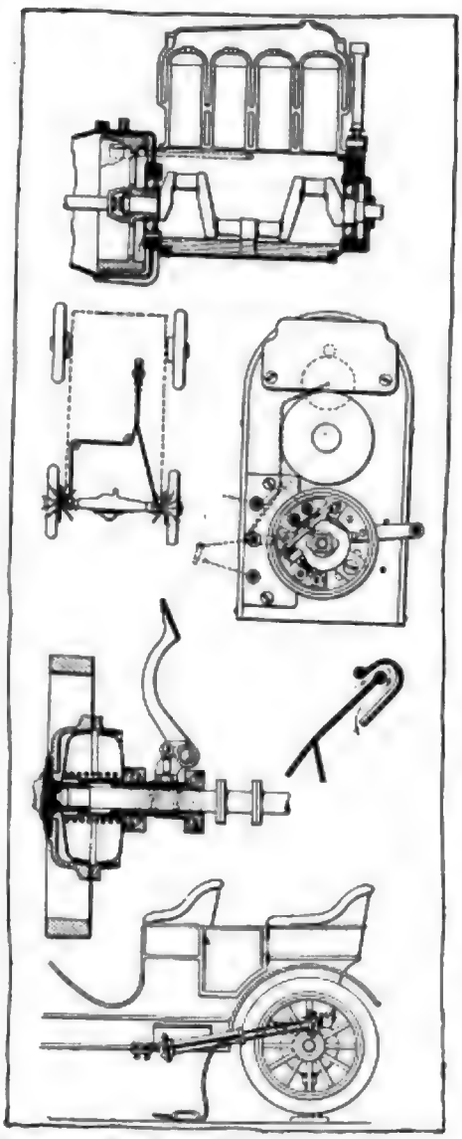
Current Motor Car Patents

ANTI-SKIDDING Device—No. 1,045,609—To William H. Putnam, New York. Filed March 1, 1912, dated November 26, 1912. A chain skidding device, operating on a new principle, is embodied in this invention, in which the chains are separate from the wheel, instead of being carried by it. These chains, which are in short length, with loose ends, are about eight in number, are secured at one end only to a common center, in the form of a roller, mounted on a bracket to the rear axle of a motor car. This roller is adapted to engage the side of the tire, adjacent to the ground-bearing portion, being thereby revolved, and the chains attached thereto revolved and extended by centrifugal force. They are thus forced between the tire and the road, in rapid succession, thus affording the tire a positive frictional grip upon the road, adapted to prevent side-slipping. Suitable controlling means are provided to enable the operator of the car to bring the rollers down into contact with the tire, or to raise the bracket arm up away from such engagement, and the chains out of contact with the road. Such a device would be more silent than an attachment to the wheels themselves, and would not wear the tire nor produce wheel-resistance when not actually required.

Tire Pump Attachment—No. 1,045,272—To Edwin W. Fishburn, Denver, Colo. Filed August 22, 1911, dated November 26, 1912. An attachment to the rear wheel of a motor car for the purpose of operating a tire pump is covered by this patent, consisting of a plate to which a wrist-pin is secured, adapted to be clamped to a spoke of the wheel, and a clamp attached to the running board. The pump base is pivoted to the clamp on the running board, and the head of the plunger jointed to the wrist-pin on the spoke. In operation, one wheel of the car is jacked up, and the attachment secured as above, and the other wheel being blocked, the car is thrown into gear, to operate the pump for the inflation of tires.

Mercedes Clutch Mechanism—No. 1,045,527—To Paul Daimler, Cannstatt, Germany, assignor to Daimler Motorengesellschaft, Stuttgart, Germany. Filed June 10, 1912, dated November 26, 1912. In a double cone clutch, this patent relates to an operating mechanism, for the purpose of disengaging the friction cones from contact with the cups, or permitting their engagement as induced by a spring situated between them. These cones are provided with sleeves extending back, and provided with spaced ball thrust bearings, mounted on slidable forks, held against rotation, and provided with rollers. An operating pedal is connected by a jointed angle arm to a wedge disposed between these rollers, which, when depressed, separates the thrust members and moves the cones toward one another, out of engagement with their respective cups.

Splitdorf Magneto—No. 1,045,406—To Theodore Hubert, New York, assignor, by mesne assignments, to Splitdorf Electrical Co., Newark, N. J. Filed October 12, 1907, dated November 26, 1912. Referring to the make-and-break mechanism of a magneto, this patent relates to a bored-out armature shaft, containing an insulating member, also provided with a bore. Supported by the insulating member is a contact member connected with the secondary winding of the armature, and with a second contact secured to an insulating sleeve disposed within the insulating member. This second contact is mounted on a movable post, located within the insulating sleeve. A contact disk is secured to the armature, in circuit with the primary windings, in contact with a brush, carried by an insulating means. An adjustable plate carries two contacts, one of which is movable, and the other insulated from the plate. The movable, insulated contact, carried by the movable plate, is adapted to be moved into and out of engagement with the brush, while the stationary contact is connected with a second insulated brush.



INTERESTING INVENTIONS OF THE WEEK

Howard E. Coffin's Splash Lubrication System
Putnam Non-Skid Device
Splitdorf Magneto-Breaker Mechanism
Daimler Double Cone Clutch Actuating Linkage
Chalmers Closed Dash Ventilator
Fishburn Power Pump Attachment

Coffin's Lubricator—No. 1,045,770—To Howard E. Coffin, Detroit, Mich., assignor, by mesne assignments, to Charles E. Wilder, Detroit, Mich. Filed April 13, 1906, dated November 26, 1912. This lubrication system is of the constant-level circulating splash system, without a pump, the circulation being maintained by means of the fly-wheel. The splash chamber is provided with an overflow, through the rear main bearing, which is so situated that the oil level is kept by it, at the proper height for splash lubrication of the cylinders, connecting rods, and wrist pins. The overflow from the rear main bearing is received by a closed fly-wheel housing, the lower portion of which constitutes an oil reservoir. The fly-wheel serves to raise this oil from the level of the reservoir to a pocket, situated in the side-wall of the fly-wheel case, from whence it is led back to the crankcase.

Chalmers Dash Ventilators—No. 1,045,778—To George W. Dunham, Detroit, Mich., assignor to Chalmers Motor Co., Detroit. Filed February 10, 1911, dated November 26, 1912. To provide ventilation for the popular closed front touring and roadster bodies, this patent relates to a dash construction wherein the upper edge is covered by a curved deflector, enshrouding it on both sides, and providing a passage for air from the front side, ahead of the windshield, if there be one, to the inside of the car.

Motor Car Sleigh—No. 1,045,771—To Ralph Carroll, Simonsville, R. I. Filed January 21, 1911, dated November 26, 1912. A special vehicle is referred to in the claims of this patent, comprising front and rear pairs of runners, upon which a motor-driven chassis is mounted. The front runners are provided with steering means, and the rear with open bottoms, in which caterpillar traction elements are disposed, motor-driven by a shaft and bevel gears.

The Motor Car Repair Shop

Re-Babbitting Bearings

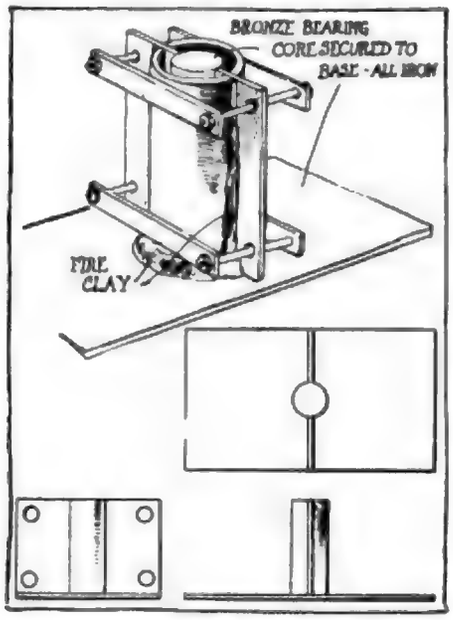


FIG. 1—EQUIPMENT FOR RE-BABBITTING

A BENT shaft will quickly ruin a set of plain bearings such as is employed in most motor car engines, and where the shafts are employed in the transmission or rear-axle the damage may be equally great one way or another. When a motor crankshaft is bent the motor bearings are bound to wear rapidly and then give rise to disquieting knocks, and any effort to refit the bearings or take up the lost motion will be fruitless unless the shaft is first straightened or trued up. The truing up of a motor crankshaft requires so much skill on the part of the workman that many manufacturers discourage the idea and recommend the fitting of a new crankshaft. There are many, however, who claim to have straightened crankshafts very successfully. Good advice on this point is to take all precautions to prevent the springing of shafts, and then should misfortune occur take the job to a reputable shop where the equipment and character of the workmen are most assuring.

The great majority of up-to-date motors now are fitted with bronze bearings lined with white or Babbitt metal; white metal generally meaning Babbitt metal or some of the other alloys, used for bearings, that are white in color. A few words therefore on a means and method of relining these bearings with the white metal when they become worn, may be appreciated.

In Fig. 1 is shown the equipment employed for this purpose in one of the greatest repair shops in the world. It comprises a mold, and facilities for conveniently securing the halves of a bronze bushing thereto, so that the molten white metal may be flowed into the bushing. The design of the mold is shown in the mechanical sketch in the upper left-hand corner of the illustration. The base plate is of sheet iron about ½-inch thick, whilst the transverse vertical partition is of cast iron and of the same thickness except for the solid-cylindrical central portion or core, which is of a suitable diameter to allow for shrinkage and machining of the white metal lining after it has been poured and cooled.

There are two pairs of clamps provided to hold the halves of the bushing in place, and it will be noticed that holes are provided in the wings of the partition on either side of the core, through which the bolts of the clamps may pass. It will be noticed that the upper clamp is near enough to the top of the bushing to cover the hole provided to form an anchorage for the white metal lining; the lower clamp also is arranged high enough so as to cover the central hole; whilst the lower hole is covered with fire clay. These holes are quite clearly shown at H in Fig. 2, and are provided so that the metal that flows into them forms integral lugs that serve to keep the lining from turning should it tend to break away or separate from the bronze portion of the bushing. The grooves shown at either end of the bushing are provided for a similar purpose, to keep the lining from moving endwise in the journal or bushing, journal being another name for the bearing box or bushing. It is important that in rebabitting a bushing great care should be taken that none of the oil holes are closed. Generally either the center hole, or the two end holes in the upper half of a journal box, are provided to admit oil to the bearing; these must be kept clean, and not filled up by mistake, otherwise the bearing will be quickly burnt out for want of lubrication. To further secure the white metal lining in the bushing, it is customary to tin the inner surface with a coat of solder. This consists in applying a coat of tin with a soldering iron so that the white metal will adhere more tenaciously when flowed into the bearing.

As it is customary to file off the edges of the two halves of a journal box in order to bring them closer together when worn; by the time relining, or rebabbitting, is necessary, it also becomes necessary to build up the bronze portion of the bearing as well; and this is done by making a pair of shims or liners out of a piece of sheet brass about 1/32 or 1/16-inch thick as the case may require, and sweating these onto the edges of the bushing halves. These should be made and fitted before the bearing is tinned for the white metal; then the tinning and sweating on of the shims can be done at the same time.

After the halves of a journal box have been prepared for the reception of the white metal they must be secured to the mold and centered so as to be concentric with the core; then the crevices at the bottom and up the sides should be closed with plastic fire clay. The chill then should be taken out of the whole outfit as it stands by playing the flame of a torch upon it. While warming the mold in this way the white metal should be on the fire and in a molten state, so that when the mold has been warmed until the tin on the inside of the journal box is about to flow, the molten white metal can be poured into it at the top, which is left open for that purpose.

Lubricating and Preserving Springs

It is a custom in one of the largest repair shops in the world to lubricate and preserve the chassis springs of motor cars whenever they are disassembled for an overhauling by painting them with a mixture of graphite and cylinder oil. This mixture prevents the accumulation of rust between the leaves, and improves the riding qualities of the springs. The mixture is prepared by simply mixing powdered or flaked graphite with cylinder oil to a pasty consistency; and it is applied with any suitable paint brush.

Oil in Rear Axles

When noise cannot be reduced by adjusting the bevel pinion of a rear axle, and it is known that sufficient lubrication with a suitable grade of oil is being provided, then the bearings may be suspected and the axle should be examined by an expert. The introduction of graphite into the oil used in a rear-axle mechanism is claimed to be very beneficial, but the use of sawdust, etc., in this manner to reduce noise is a very poor makeshift which is bad mechanically and otherwise.

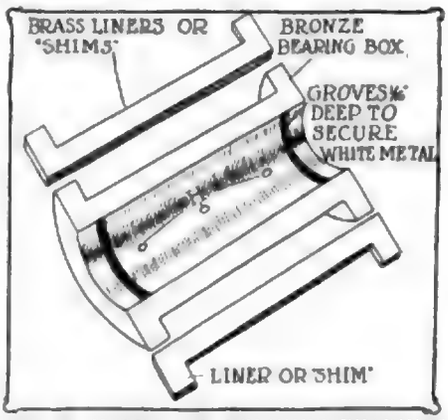


FIG. 2—HOLES FOR RELINING BEARINGS

From the Four Winds

FEDERAL Aid in Mississippi—Work is soon to begin on the first roadway in Mississippi built with federal assistance. In order to improve the routes of the rural carriers the government will furnish $10,000 for the improvement of the road between Greenwood and Carrollton. The county has agreed to furnish $20,000.

Brazil Encourages Roads—A loan netting $650,000 has been floated by the Empreza Autoviaria Paulista, a company which has a government concession for building a motor coad connecting Sao Paulo and Santos, Brazil. The building of this road will mean that a motor car will become a necessity to each one of several thousand coffee planters interested in the vast territory between these two ports.

Canadian Road Report—Up to October 26 last of the 62½ miles of macadamized road laid with government materials, 18 were on the King Edward road. It is estimated that during the past year no less than 12,161 miles of road were maintained systematically under articles 535 and 1,080 of the municipal code and under good roads act of 1911. The precedent established in the case of the road from Montreal to Rouses Point is likely to be followed, the government guaranteeing a large proportion of the cost and the municipalities but a small percentage.

Road Meeting for Missouri—Plans were made at a meeting of the recently organized Missouri Highway Association, held in Kansas City, November 20, to bring together all the organizations in the state that are interested in good roads for the purpose of crystallizing the sentiment and getting some definite result in the matter of good roads. What will probably be the largest good roads meeting ever held in the state will be the meeting which has been called for December 11 at Jefferson City. At this meeting a plan will be brought forward whereby the commission can, without an increase in taxes, raise $2,000,000 to be used in the construction of good roads throughout the state. This plan as outlined by Roy F. Britton, president of the association, will make use of the state road fund, which is at present $300,000 annually. At the present time this amount is divided among the 114 counties of the state, each receiving 3 per cent, and this only when called for. The sum received by each county is so small that but little good can be accomplished. It is proposed that $100,000 of the annual road fund be used for paying a $2,000,000 bond issue at 5 per cent and $100,000 be set aside as a sinking fund to retire the bonds in 20 years, and as provision can be made to retire any portion of the bonds each year, this will reduce the interest each year. The proceeds of the bond issue to be spent by a highway commission. The balance of the road fund, about $100,000, is to be used by the commission in administering the law and for emergency work.

Aldermen Aroused—A Milwaukee alderman has come forward as the protector of the motorists by asking the Milwaukee common council to pass his ordinance making it a misdemeanor for street car companies to maintain tracks with sharp or cutting edges at curves, intersections and switches, or such as may be above the grade of the street. The alderman is Benn P. Churchill, the only Socialist alderman who owns a motor car, and therefore one of the few or the only alderman of that creed who is interested in legislation benefiting the owners of cars. The proposed ordinance would place a penalty of $10 to $100 on the violation of it, with an alternative of not more than 90 days in jail.

Getting After Car Thieves—The theft of five cars in Milwaukee in 8 days' time has caused a renewal of the agitation for a state law which will place motor car stealing on the same plane as horse stealing. Not only has the Milwaukee Automobile Club, father of the movement, become more active, but the services of the insurance and indemnity companies have been enlisted and will present a solid front before the coming legislative session. Of the twenty or thirty cars stolen in Milwaukee during the present year, all but two have been recovered, generally in a damaged condition. The underwriters are employing private detectives, but as yet have not made any considerable headway over the police department.

Spain Wants American Motorists—American motorists are invited to visit Spain if they want to do some touring abroad over some excellent roads, according to Louis Scatti, of Madrid, who is spending some time in Boston. "I want to see all Americans who visit Europe include a trip to Spain. No country of Europe offers greater inducements in picturesque and varied scenery and the conditions for motor travel are excellent. Within the past 12 months 37,000 miles of road have been put in fine condition for motor cars. An appropriation of approximately $10,000,000 has been made by the government for road improvements. No one has done more to popularize the sport of motoring than King Alfonso. For those touring by motor the facilities for getting the cars into Spain are easy. Any member of one of the national motor organizations need only apply through his association. A steady improvement is taking place in Spanish hotels and few large towns are now without at least one first-class place, while in Madrid the competition has done much to improve conditions."

Roads an Election Issue—Improvement of highways formed the issue in many election districts in Wisconsin. At Appleton, Wis., the question of building good roads or no was the only issue between two candidates for the assembly, and the good roads advocate won out. As the result of the increase of good roads advocates in the state senate and assembly it is probable that the annual appropriation made by the state for highway reward will be increased from $350,000 annually to a figure probably double that.

Election at Wilmington—The Wilmington Yacht and Automobile Club has elected the following officers for the ensuing year: Charles R. Smith, president; Coleman du Pont, president of the E. I. du Pont de Nemours Powder Co., commodore; John B. Bird, Harold S. Schutt and Edward R. Pusey, vice-presidents; Joseph Bancroft, A. Felix du Pont, John B. Bird, Harold S. Schutt and Edward R. Pusey, executive committee; Charles W. Bush, secretary; William H. Forbes, treasurer. Harold S. Schutt, Joseph Bancroft, A. Felix du Pont and Egbert Moxham, directors for 3 years.

Stirred Up Over Roads—More than 100 members of the East St. Louis Commercial Club motored to Collinsville, Ill., last week to meet the Illinois state highway commission, which is touring the several suggested routes for the new state highway. East St. Louis has carried on an active campaign to have the highway through East St. Louis instead of Granite City. The highway commission, accompanied by motorists and good roads boosters from all the towns between East St. Louis and Springfield, was brought to East St. Louis where luncheon was had in the Elks' Club. Good roads talks were made during the luncheon.

New Road Association—Good roads boosters of the tri-cities and vicinity held a mass meeting in Davenport, Iowa, last week, forming the temporary organization of the Tri-City Ocean-to-Ocean Official Highway Association, whose permanent organization was placed in charge of a committee composed of Reed Lane, chairman, Davenport; John H. Bushong, Moline; George W. Ross, East Moline; H. S. Cable, Rock Island; A. E. Nissen, Davenport. The main object of the meeting was to secure the routing of the new ocean-to-ocean highway through Moline, Davenport and Rock Island as the exit point from Illinois and entry into Iowa. The only other proposed entry point is Clinton, Iowa, which already has raised

a considerable sum of money to have the tourist road to the Panama exposition routed through there. Iowa City and the Tri-Cities are the only cities which would suffer to any great extent if Clinton were preferred.

Helps the Churches—Church attendance has been increased in New Orleans by motor cars, according to statements from several clergymen. Delays in getting horse-drawn vehicles ready or the inconvenience of crowded street cars are objections removed by the motor car, which tend to increased attendance. In addition the pleasure of the ride before and after the service adds recreation to the ecclesiastical duty.

Booster for Federal Aid—Federal aid for highway construction will receive a considerable impetus from the Badger state as the result of the entrance into congress of Elmer E. Browne, of Waupaca, Wis., who as state senator for 8 years was one of the most ardent advocates of state reward and is known as one of the parents of the present state aid law now in force in Wisconsin.

Milwaukee Likes Asphalt—More than 350,000 tons of asphalt were laid on the streets of Milwaukee during the season of 1912, according to the report of the commissioner of public works, and next year it is planned to increase this aggregate by 50 per cent. In addition to the 350,000 tons of new asphalt laid as pavement, there were used 41,000 tons for repair work on old asphalt streets. By the close of the coming year Milwaukee motorists, who have been bitter in their denunciation of the lack of care of pavements, will hardly have cause for complaint. In addition to suffering damage to tires and mechanism of cars, the motorists have been obliged to hear criticism from motorists from all parts of the country who visited Milwaukee, and the tourist business has thereby suffered to a considerable extent.

Ontario's Motor Revenue—Ontario's revenue last year from the sale of licenses for motor vehicles totaled $50,831.25, twice the amount received during the year 1910, which was $24,394. The revenue for 1906, the first year fees were imposed, was only $15,235.15. The licenses issued last year totaled 11,339, and for 1910, 4,320, while in 1906 1,176 licenses were issued. Fees collected for issuing charters to automobile corporations totaled $235,663.10.

Texas After Car Thieves—An effort will be made to secure the passage by the Texas legislature at its next session, which meets in January, of a law making it a felony for any person to take or use a motor car for any purpose whatsoever without the consent of the owner. This proposed measure is being advocated by Chief of Police I. N. Davis, of El Paso, who has obtained the support of the chiefs of police of Dallas, Fort Worth, Houston, Galveston, Waco and San Antonio to the proposed bill. The measure will be introduced in the legislature by Representatives Richard Burges and Eugene Harris, of El Paso. The law with reference to the taking of cars, according to Mr. Burges, should read that a person taking one for any purpose without the consent of the owner, shall be guilty of a crime, and his punishment assessed at so many years in the state penitentiary, or, where the offender is under age, so many years in the reform school.

Ohio's Chauffeur Registration—There is one county in Ohio that has not a single chauffeur. That is Vinton. According to the report of Registrar Shearer to Secretary of State Graves there are 7,931 licensed drivers in the land of the buckeye. Cuyahoga, with Cleveland as the metropolis, leads with 1,770, while Hamilton, with Cincinnati as the metropolis, is second with 1,320. Franklin has 772. There are a few machines in Vinton, but the farmers must like driving themselves.

Merger in Winnipeg—The Winnipeg Motor Trades' Association has been affiliated with the Winnipeg Industrial Development Bureau, and two representatives of the association have been elected to the board of directors.

Boston Grants Parking Space—After studying conditions for several months following a number of hearings granted to motorists the Boston street commission has picked out a number of parking spaces for motor cars. However, only about one-third of the requests made by the motorists have been granted. The traffic rules adopted 3 years ago provided for parking spaces along the Common side of Park and Tremont streets and Postoffice square. Now the following places have been designated: Doane street, northerly side, where cars may stand half an hour; Bowdoin street, between Beacon and Derne, alongside the state house; Beacon street, the entire length of the Common; Charles and Arlington streets, flanking the Public Garden; Newbury street, between Berkeley and Clarendon streets, all for a period of 1 hour. Doane street is the only downtown business street in the list and it is a very short street and narrow.

Old Roads Made New—No. 6—In the Old Dominion

Here is a stretch of road near Petersburg, Va. One illustration shows the road before it was improved and the other shows it afterwards

The Realm of The Commercial Car

Narrow Alleys Handicap to Chicago

Congestion in Loop District Forces Police to Arrange System of Movement That Will Help in Operation of Motor Trucks and Other Vehicles—Investigation made by Motor Age Produces Interesting Facts

By W. B. Stout

THE Chicago business district has too little alley space. Traffic through many of the alleys is poorly managed. Realizing the inadequacy of present methods of handling alley traffic, the Chicago police department is arranging a system of movement through these cross lanes which will relieve at least a part of the present congestion. Traffic in narrow alleys will be run only one way and special care will be taken to eliminate long waits.

Probably the busiest alley in the Windy City is that located back of Carson, Pirie, Scott & Co.'s store, running between Madison and Monroe streets. With an entrance at either end but 13 feet wide as many as 500 vehicles a day are handled in this lane, a large part of it at rush hours.

The Boston Store Alley

A close second is the alley back of the Boston Store. The writer recently noted a case where this alley was completely filled with vehicles and with eighteen more waiting outside for their turn at the alley.

Other alleys are almost as bad, the one back of Siegel, Cooper & Co.'s store necessitating an average delay of over an hour. Often 2-hour waits are made at this point. Back of Rothschild & Co.'s department store the waits often range from 1½ to 2½ hours. At the Boston alley waits of 3 hours are not unusual.

Talking with several drivers in this waiting line at the Boston Store they gave the following time as usual for the department store alleys of downtown Chicago: Boston Store alley, wait 1 to 3 hours; The Fair, wait average 1 hour; Siegel, Cooper & Co., wait ½ to 1 hour; Rothschild & Co., wait 1 to 2½ hours.

Whole Story in Itself

The alley back of Carson, Pirie, Scott & Co.'s establishment is a whole story in itself. Here there can be seen in any 1 day as many phases of alley delivery as one cares to contemplate, and every hour shows up new defects and new requirements in city delivery.

Fig. 1 shows the arrangement of the alley in general. At the north end is Madison street. From here a 13-foot alley runs toward the center of the block, alongside the Heyworth building. This building is built right up to the line of the company's property, the alley itself being on Carson-Pirie's ground. The Heyworth building not only makes use of this alley, but by the arrangement of the loading platform actually blocks its use for Carson-Pirie and others for sometimes several hours a day. This platform comes just where the alley widens out and is shown very clearly in the illustration A, which not only shows the arrangement, but explains some of the traffic congestion at this point.

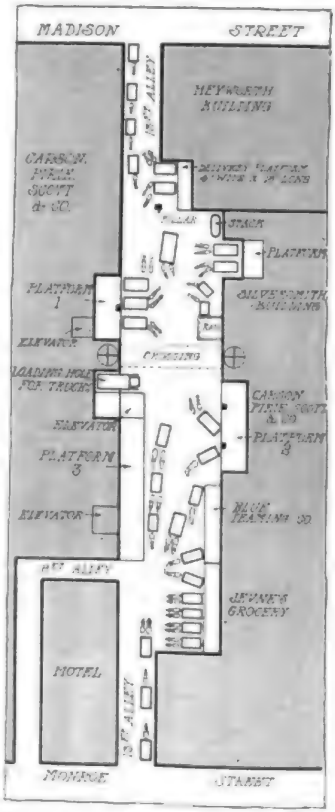


FIG. 1—ALLEY AT REAR OF CARSON, PIRIE, SCOTT & CO., CHICAGO, SHOWING AVERAGE CONGESTION

The team A is backed up to the Heyworth delivery platform as far as it will go and yet one can see how great a proportion of the vehicle projects into the alley, which is much too narrow already. It is for this reason that most of the interesting incidents in the alley happen at this point.

When teams are in place at the Heyworth platform, as they always are, there is but barely room for a two-horse team to pass through, and while the teams are backing into the space the alley is completely blocked at this point. For an extra wide wagon to pass through this end of the alley is a very close job.

One Cause of Delay

The writer noted the delay caused by the passing of a box wagon with a wide body. The wagon at A was backed into position. The express wagon was also at B and the box wagon, which with the horses, was 27 feet long, attempted to pass. It got wedged in first at an angle between the two vehicles. Then five men—the policeman and idle teamsters—slid the back of the empty wagon around and set it straight down the alley. Trying to get by again the wagon box this time wedged in between the wall on the left and the footboard of the wagon on the right. It was some time before the vehicles were gotten apart. After this the box wagon backed into the bigger part of the alley while the driver of the wagon A maneuvered around to get his vehicle a little further back. It took over 10 minutes to get the box wagon through this space.

The Heyworth Platform

The Heyworth platform can accommodate only two wagons in the open space, which is 9 by 18 feet in dimensions. On one morning when it was visited an ice wagon had been standing in this space for 1½ hour and a paper wagon for 2 hours. This held others away and there were four wagons waiting a turn. These only had access to the end of the platform, which is but 4 feet wide, and further encumbered by a very dirty waste box and a litter of papers. This left a platform space of less than 18 inches for the unloading. The

wagon C is shown backed up to this point, the open waste box being seen at D.

Another loss at this point is occasioned by lack of facilities inside the building. For one thing the elevator closes down at noon so wagons arriving at this time must wait until the elevator man gets back. Then there is but one slow elevator to serve the nineteen-story building. There is no receiving clerk and goods must be carried up by the drivers. One delivery was noted where a driver took 1½ hour to deliver three boxes in this building—small ones, too.

A further revelation of inefficiency was seen when a three-horse coal wagon, after waiting 1 hour outside the entrance of the alley, drove in to make a delivery to the Heyworth building and it was discovered that the emergency coal hole was under the wheels of both wagons then in the platform area. Hence the coal wagon had to wait 1½ hour more until both wagons had left. Then it was impossible to back into the area from the alley side on account of completely blocking it, and the wagon had to back in endwise, parallel to the position of the wagon G in the illustration. In this position the coal could neither be shunted out of the rear gate nor through the side chutes so that the whole load had to be shoveled off over the rear wheel and by hand.

Views of a Policeman

As a result of this experience the officer in charge of the alley barred coal deliveries in the alley until after 5 p. m. The driver of the coal wagon was very indignant over the situation and bewailed his luck at getting such a haul.

"I get but $1.17 for this load," he said, "and look how long it takes. These new motor trucks are getting all the good routes and we fellows have to take this kind. We can't make so many deliveries as we used to and that cuts us down. No, we don't like this kind of coal delivery."

Before this coal wagon got into the alley a second one was waiting in the street outside for its turn to enter.

"There is a great disadvantage in letting coal wagons in here during rush hours," said the officer, "for once they get in and block things, it is often impossible for the horses on the load to handle it in backing. They put such heavy loads on horses in coal work and when they can't back up they hold everything. Then all the rest of the traffic has to move about and give way to the coal wagon, and the result is more delay. It is best to keep them out until later."

Before the alley will be really handy for traffic either the delivery opening at the Heyworth building will have to be deepened so that teams can back in out of the way, or the building cut away to widen the alley to its proper size all the way through. The latter would be the better way so far as traffic is concerned. Certainly something should be done to enforce better arrangement at this point.

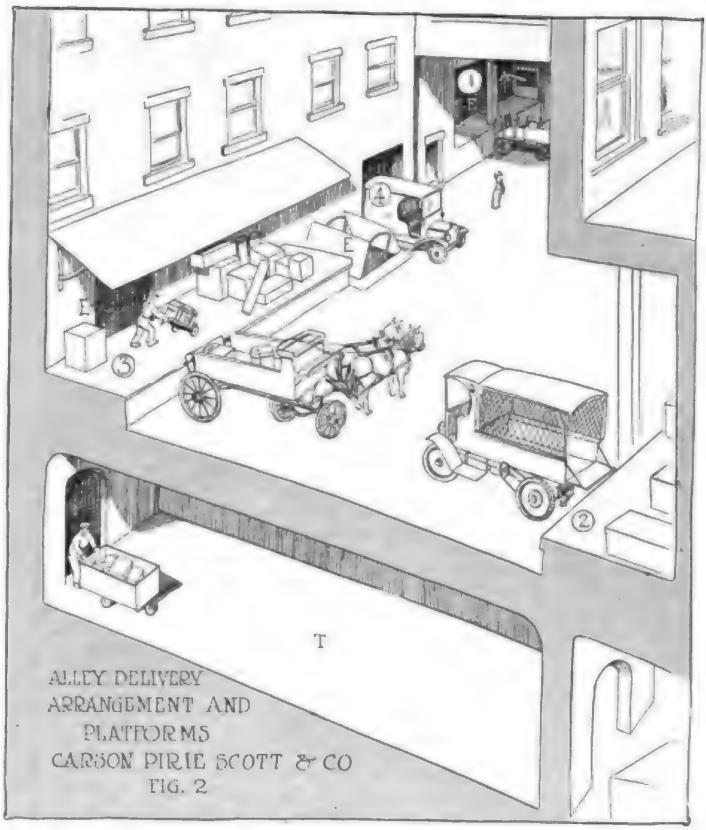


FIG. 2—ALLEY DELIVERY ARRANGEMENT AND PLATFORMS AT CARSON, PIRIE, SCOTT & CO.'S.

Next to the Heyworth building is the Silversmith building, having a platform for two teams. These are shown backed into position at E. The amount of blockade caused by these vehicles is not so great and the building is not so large as the Heyworth, but that the platform is vacant for a fair percentage of the time. Often the space, taken up in the picture by the wagons E, is filled with wagons waiting for a chance at the Heyworth delivery platform, and then wagons to the Silversmith building must wait their turn until the waiting vehicles can get out of their way.

The first Carson-Pirie delivery platform is opposite the Silversmith platform, but a trifle south and has room for six to eight wagons. This platform is flush with the wall of the building as shown at 1 in Fig. 2 and in the photograph B, and is served by an elevator E. Traffic conditions here are fair, as only a part of the firm's incoming freight is handled at this point. The clerk's office is at A.

The alley is divided centrally by a passageway, or rather a crossing connecting the store across the alley, and over this there is a continuous stream of people passing. On this account this point is kept free of vehicles at all times. The stories above are connected by a bridge.

Just south of this crossing is an opening or hole in the wall of Carson-Pirie's into which the motor trucks of this firm back for unloading, as shown in Fig 1. The photograph C shows this part of the alley more in detail. Fig. 3 shows the general arrangemept partly in section of all three of the delivery platforms of this firm.

Carson-Pirie's Platform

At 5 is shown the first platform, the bridge overhead showing just over the crossing. At 4 the motor truck is shown backed into the hole just mentioned. At E next to it, is an elevator from the shipping room below. Next to it, and projecting into the alley, is the platform (3) on which is handled bulk goods and freight for the warehouse. This is roofed over and floored with concrete. A large door at E in the drawing opens to a second elevator which may be summoned by a bell at the right of the door at any time. This large elevator serves this platform 3. The photograph D shows this plat-

A—HEYWORTH BUILDING, CHICAGO, HAS 13-FOOT ALLEY ENTRANCE

B—ONE OF CARSON, PIRIE, SCOTT & CO.'S LOADING PLATFORMS SHOWING ITS ARRANGEMENT

form and a team F blocking the alley in backing in.

From the shipping room in the basement a passage runs under the alley as at T, connecting with the book and stationery building of this firm across the way. In the basement of this building is handled most of the express business, and this work is sent out from platform 2 shown in the foreground of the drawing.

Across the alley from the platform 3, as shown in Fig. 1, and at G in photograph D, is a small projecting platform used by the Blue Teaming Co. Here wagons stand during the day awaiting call on contract hauling. Some of them stand all day without moving from the platform. At other times all the wagons will be working. These vehicles when all together often block the alley to a very large extent. The photograph D shows the alley completely blocked for the moment by a two-horse wagon in the act of backing in to the platform, 3.

Congestion in Alley

Beyond this wagon is seen on the right the outlet to the alley at this end—but 13 feet wide—while at the center of the picture just behind the wagon stand the vehicles of the Jevne Grocery Co. A closer view of this platform is seen in photograph E, showing how the horses projecting out obstruct the alley at an important point. The space left leaves room for but one wagon to pass. The wagon at B in the photograph is waiting until the wagon at A gets in before it can proceed.

The Jevne platform location is indicated in Fig. 1. This firm uses several motor trucks. On one occasion, timed by the writer, the motor vehicle after loading waited 15 minutes before it got a chance to move out from this platform. The driver stated that this was about the average time. Often waits of 30 minutes occurred. This delay was partly due to the turning radius of the trucks, requiring backing in order to get out.

In the photograph B is one other indication of a source of congestion in this alley; i. e., the express wagon at the right. Some eight to ten of these wagons arrive in the alley from 11 a. m. to 2 p. m., and many of them, after backing into a vacant space, stand there until 5 or 6 p. m., while the drivers make the rounds of the buildings.

Problems of the Drivers

The drivers have their own problems to meet, especially in such places as the Heyworth building. Here they go from floor to floor collecting parcels. At each floor instead of using the time to call the elevator for each shipment, they stack the packages collected. At the next floor the same thing occurs until the building is covered. Then they take the elevator for an entire trip and collect their packages at each floor as they come down. This has resulted in the loss of many packages by theft since there is no one to watch them as they lay by the elevator door. The risk is due largely to insufficient freight elevator service.

Thus are pointed out some of the more glaring alley difficulties at this point, merely as an object lesson of conditions obtaining in a greater or less degree at other alleys in all our larger cities. Motor trucks will remedy much of the congestion, but these cannot be used successfully until the systems in the buildings themselves allow of a quicker delivery and shorter stops.

An indication of the amount of traffic on a light day in this alley is given by the following census at consecutive hours:

11 a. m.—Two-horse, 24; one-horse, 14; 3-wheeled van, 1.
12 M—Two-horse, 5; one-horse, 9; 3-ton electric truck, 1.
2 p. m.—Two-horse, 5; one-horse, 9; motor trucks, 4.
3 p. m.—Two-horse, 12; one-horse, 8; motor trucks, 3.

These figures indicate only the number of standing vehicles at these times as between the hours many other vehicles came and went.

BUILDING TRUCKS FOR PACKERS

Motor trucks are now being built for Swift & Co., Chicago, at the Union stock yards, the first machine built at the works having been in operation for about a month. Swift & Co. are operating over a dozen motor trucks, and in their own repair shop have rebuilt a number of machines of out of date construction, bringing them up to the standard required at present. The success in rebuilding led the Swifts to consider the assembling of their own motor trucks for their own work, it being planned that an addition would be made to the repair shop to take care of the work.

Finally, however, a different arrangement was made and the building of the machines put in the hands of the Mechanical Mfg. Co., a firm situated near the Swift plant and engaged in the manufacture of all kinds of machinery used in the packing business from hand trucks for loading platforms to railway bumpers for the tracks. By placing the work in the hands of this firm the truck can be put on the market for general sale and it is expected that this will be done within a few months.

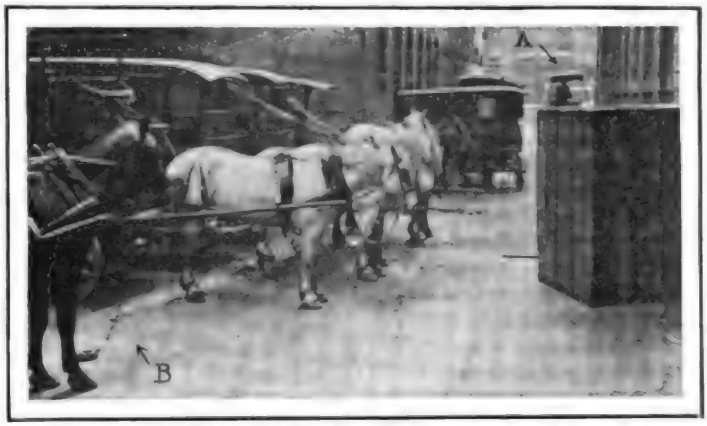
The machine is of 4-ton capacity and in appearance and general dimensions closely resembles the Packard. The mechanical details, however, differ considerably. The motor used is a Continental 40. A Brown Lipe gearset of generous dimensions is used and placed amidships. The whole rear end is Timken. The axles and jack shaft are of Timken construction, these constructions being so well known that no further description is needed.

Results so far have made the users very well satisfied with it. The driver is the same who is so well known for his skillful handling of the reins at horse shows in showing off Swift's prize four-horse team. Since he leaves the truck at show times to drive the prize team and at other times prefers the motor one might see an indication that the highest class drivers are open-eyed enough to see the advantage of the motored machines and to join early with their coming, sticking to the horse only for special occasions.

Ten more of these motor trucks are under construction and it is expected will be finished for Swift & Co. within 3 months. Once the packers are supplied the machine, it is understood, will be put on the open market.

Transportation Delays at Terminals

Editor's Note—This is a digest of a paper read by David Beecroft at the meeting of the National Association of Automobile Manufacturers held at Detroit, Mich., November 14-15.



E—BLOCKADE CAUSED BY HORSES AT SOUTH END OF ALLEY. THE HORSE AT B IS WAITING UNTIL WAGON A GETS IN BEFORE IT CAN MOVE

OF 287 motor truck and horse wagons checked at railway and steamboat terminals in the cities of New York, Chicago and Detroit it was discovered that these vehicles had an average delay of 11.3 minutes from the time they reached the proximity of the freight terminals until they reached the unloading platform and were ready to begin unloading or loading operations.

Figures taken of the length of time required for these 287 vehicles to unload or load showed an average of 27.3 minutes each so that roughly speaking each vehicle waited almost half as long to get to the loading or unloading platform as it required to perform the loading or unloading. This loss of time cuts down the efficiency of the motor truck as well as that of the horse vehicle. The operator of horse vehicles does not object seriously to this loss in time or delay waiting to reach the loading platform because the horse has to be rested and this offers a good opportunity; on the other hand with a motor truck it is different in that the truck does not need a rest so that every delay of this nature reduces the amount of work it can do per day and correspondingly reduces its efficiency.

The length of delays at loading platforms varies, due to differences in population, differences in street widths and differences in the methods of handling traffic at the freight depots. Of the three cities, New York, Chicago and Detroit, the last named experienced the least delay. Of forty-two vehicles checked in the city of Detroit the average delay at one railway freight terminal was 3 minutes and at another 4.4 minutes. This difference in time was due to narrower approaches at one than the other.

Chicago averages better than New York in the reduction of time lost at terminal depots. Of three leading Chicago freight terminals in investigations extending over 3 successive days, the average delay at one depot was 6.2 minutes per vehicle, at another 11.7 minutes, and at the third the amazing figure of 25 minutes. In contrast with this are the figures taken from three New York city dock terminals based on observations extending over a similar period. In one the average delay was 9 minutes, at a second 10, and at a third 15.5.

While these averages do not appear abnormally high they invariably represent a high ratio with the time required to unload. This was demonstrated at one Chicago depot where the average delay was 25 minutes and the average unloading time 24 minutes so each vehicle waited longer to get the chance to unload than was required in the unloading. At another Chicago depot the average delay was 11.72 minutes and the average unloading time 23.74 minutes, giving a delay-unloading ratio of 1 to 2. In New York at one of the docks the average delay was 10 minutes and the average unloading time 19 minutes, which is more than a 1 to 2 delay-unloading ratio.

The investigations in all three cities showed that at certain periods of the day it is possible to so conduct traffic that little delay is caused. Between the hours of 7 and 8 in the morning 75 per cent of the vehicles do not meet with delays, whereas at later periods in the day the maximum delays in Chicago range from 30 to 79 minutes and in New York city from 43 to 130 minutes. With vehicles held up for over 2 hours waiting to unload and being able to unload in less than 30 minutes it is impossible to get that efficiency which modern transportation demands.

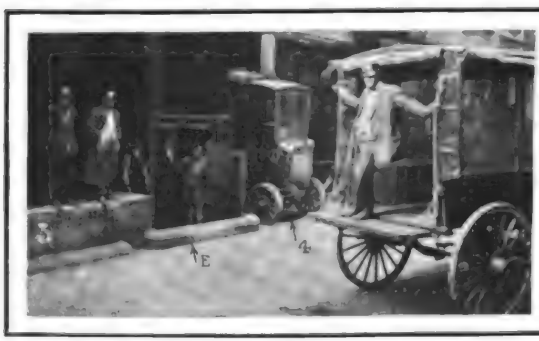
But all of the loss of time or delays at freight terminals whether in connection with railroads or steamboat docks is not due to lack of capacity, lack of system is a big factor in many cases. Quite frequently at railroad terminals there is not a sufficiently large executive force to issue the bills of lading as called for by the teamsters. Often twenty-five to forty teamsters are seen lined up waiting for such documents and some of them have had to wait more than 1 hour for them. In the meantime their wagons or motor vehicles are standing idle in the freight depot, not only losing money for its owner but aiding in a general congestion of the place and so holding up the entire system. If a modern bank were as poorly equipped with clerical force as some of the railroad depots are it would be impossible for it to transact its business even if the hours were extended from sunrise to sunset.

Often the system of handling freight within the depot, that is from the time it is unloaded off the wagon or motor truck until it is loaded into the freight car, causes much delay to the motor truck. In some depots all freight is handled within the building on hand trucks and long delays are caused when motor trucks are unloading by the freight handlers having to wait for more hand trucks. The more enterprising railroad companies are already endeavoring to correct this abuse and have adopted an application of motion study to the method of working the men and the hand trucks. This aims at the man having a full hand truck load not only from the motor vehicle to the freight car but also from the freight car back to the motor vehicle. Enormous savings of time have been accomplished in this way.

Hand in hand with this motion study improvement is that of a new scale of payment for freight handlers based on a stated salary and in addition a commission on all freight handled above a determined point. In this way the freight handler aims at working expeditiously because he profits directly in proportion to the amount of work done.

To demonstrate that it is possible to hasten the unloading time and also the loading time at terminal depots, one has but to look at the special facilities for handling perishable goods. Often not one-quarter of the time is required for handling these goods as compared with that required when handling regular freight. The employment of system will greatly ameliorate the present difficulties. To show firmly the railroad companies are convinced of this we quote from a leading Chicago freight terminal superintendent, who states: "If motor trucks were used exclusively at six of the big terminals of Chicago the work could be done in one-half the time and at one-third the cost. This would mean a saving in Chicago transportation at these six depots of $4,320,000 per year."

One of the greatest obstructions to the reduction of delays at present is the driver of horse vehicles. He generally is in sympathy with the delays and often actively assists in causing them. Recent observation showed traffic jams in the city of Chicago where 155 to 175 vehicles, mostly horse trucks and some motor trucks, were held for 1 hour 20 minutes. The blockade was finally broken up by mutual consent of the drivers and was accomplished in less than 5 minutes.

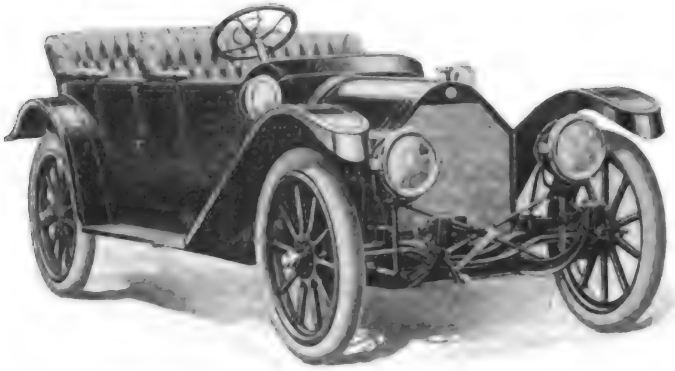


C—SHOWING WHERE CARSON PIRIE SUBSTATION TRUCKS LOAD AND ELEVATOR FOR LOADING FROM BASEMENT

D—WAGON BACKING INTO CARSON-PIRIE PLATFORM BLOCKS ALLEY COMPLETELY WHILE UNLOADING

Regal Underslungs Continued Unchanged

Minor Details Show the Only Differences in Models T, N, and H for 1913



THREE-QUARTERS FRONT VIEW OF REGAL UNDERSLUNG 35

WHILE still wedded firmly to underslung frame suspension, to meet the demand for a car of standard construction, the Regal Motor Car Co., Detroit, has added to its line of four underslung cars a new model, which has the frame suspended over the axles.

This new model, styled model C, is a five-passenger touring car, which will sell at a popular price. A new motor has been designed for this model, and the body is of a type new to Regal practice. The other models are continued from last year with only minor changes. These are made in two chassis types, models T and N being on the smaller of the two, and models H and S on the larger. These are both of four cylinders, and differ chiefly in size. The policy of the Regal company is against radical changes in its yearly models. Improvements are made in the regular models, without regard to season, and announcement is made at the time the change goes into effect.

New Motor Described

The new model is equipped with a four-cylinder monobloc motor, with exhaust passages integral, 4 inches bore and 5 inches stroke. The crankshaft is carried on three bearings, as is the camshaft. Valves are all on one side, situated side by side. The crankcase is divided horizontally, the upper half carrying the bearings and supports, while the lower carries the oil reservoir. The motor is mounted at four points by integral arms, direct from the main frame. Cooling is by means of a centrifugal pump, and an adjustable belt-driven fan. Lubrication is by the constant-level, circulating splash system, and ignition is by means of a dual magneto and storage battery.

New Frame Location

The clutch, gearset, axles and springs are very similar to those used on the former Regal models. The frame is of channel steel, differing from former frames of this product in that it is overhung instead of underslung. The chassis views at the bottom of the page will illustrate this difference. The general lay-out of this chassis otherwise bears close resemblance to that of the underslung types, as is shown in the lower illustration opposite. The overhung frame not only permits the motor to be suspended direct from the frame, but allows the use of three-quarters elliptic springs.

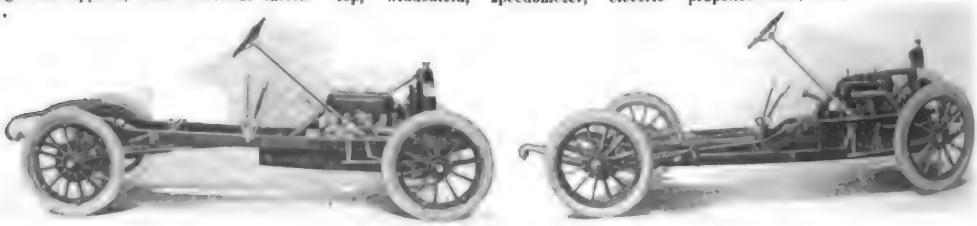
The body represents a good example of the modern trend of motor car coachwork. A wide band extends about the gunwhale of the car, finished in a light blue, while the rest of the side panels are in a darker shade of the same color. A moderate cowl is placed over the dash, and ample leg-room is provided in the tonneau. This model is regularly equipped with a top, windshield, speedometer, electric lights, electric horn, demountable rims, tire irons, foot and robe rails and a kit of tools.

Model T, the small underslung model, is a truly Regal product, and differs little from present models. In brief, this model both this year and for the coming season has a wheelbase of 100 inches, with 32 by 3½ tires on demountable rims all around. The cylinder sizes are 3¾ by 4½ inches. They are cast in one piece. The valves are located on one side, and are both operated from the same camshaft. Their mechanism is completely inclosed by sideplates to exclude dust and to muffle their sound, but which are removable by taking out two thumb screws for the purpose of adjustment and cleaning. The crankshaft is supported on two die-cast bearings. Connecting rods, crankshafts and camshafts with integral cams are drop-forged and heat-treated.

Pistons are of hard grey iron. The crankcase is of the barrel type, of cast iron, and mounted at four points to a subframe, secured in turn to the main frame at four points. Lubrication is by the circulating splash system. The connecting rods, wrist pins and cylinders are lubricated by splash from the crankcase. The level in this chamber is maintained at a constant level by overflow passages, through which the excess drains into a reservoir below. A plunger pump takes it from here to a sight-feed on the dash, whence by gravity it is fed to the main bearings, overflowing into the crankcase. Dual ignition is used, current being taken from a magneto and from a dry battery in starting.

Distinctive Driving System

A special feature in the construction of this model is the driving system. The clutch is of the leather-faced cone type, made of aluminum, and very light in weight. The gearset is located on the rear axle, and the driveshaft is connected to it on practically a straight line, two universal joints being used. The complete propeller shaft, except directly behind the



REGAL MODEL S AND T SHOWING DIFFERENCE IN FRAME SUSPENSION

New Overhung Model for Conservatives

New Chassis Similar to Older Models With Exception of Suspension Plan

clutch, is housed in a steel tortion tube. The gearset affords three speeds and reverse and operates on the selective principle. An interlocking device is embodied in the control of this member, which, makes the engagement of more than one gear at a time impossible.

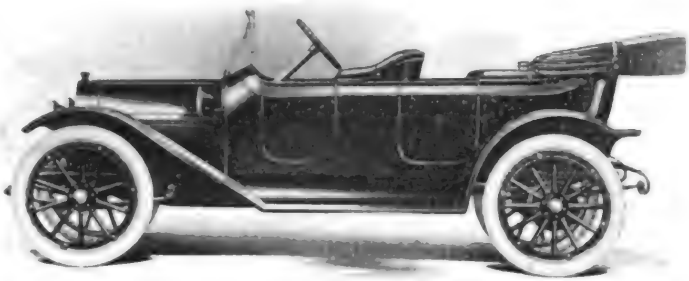
The rear axle is of the semi-floating type, propulsion being through the tortion tube. The rear springs are perched beneath the axle and are of the half-elliptic type. The main frame is entirely underslung, and the subframe is of the tubular type. The front axle is of the I-beam type.

Steering is by a worm-gear mechanism, through a 16½-inch hand wheel, on the right side of the car. The control levers are placed at the right of the driver, inside the body. Spark and throttle control is by levers on the top of the steering wheel, with a foot accelerator, and clutch and brake controls are in the form of the usual pedals. The front floor boards are aluminum covered, and removable for inspection and adjustment.

The body seats four passengers. The seats are tilted, affording a comfortable position, and permitting a slightly lower body, with the same amount of leg-room. For 1913 the body of this model is slightly longer than this year and trimmed with nickel-plated fittings. Especial attention is called to the fact that, owing to the low suspension, made possible by the underslung frame, ingress and egress are greatly facilitated.

Roadster Body Improved

The model N roadster is built on the same chassis as the touring car, differing in the angle of the steering column, location of the gasoline tank and the body. The body lines on this model have undergone slight improvements over those of this year. The position of the seat remains the same, but the back has been given more curve, and the seat has been carried higher. Just at the rear of the seat is an oval 20-gallon tank, and from the rear, in a graceful curve, the cover of the toolbox extends back. In this are contained the tools, supplies and the lighting battery. The rear springs on this model have been lengthened to 52 inches.



NEW REGAL MODEL S, A STANDARD MODEL

Model H is the first of the underslung family of Regals. It is a 35 horsepower model with four cylinders, 4¼ by 4½, with the cylinders cast in pairs. The general mechanical features are similar to those of the larger model with the exception of the cooling, which is by thermo-syphon system. This system is made quite practical for so large a motor, it is asserted, by the depth of the radiator made possible in the underslung frame construction.

The general chassis design is very similar to the smaller model, except as to size and added strength. It is furnished as a five-passenger touring car.

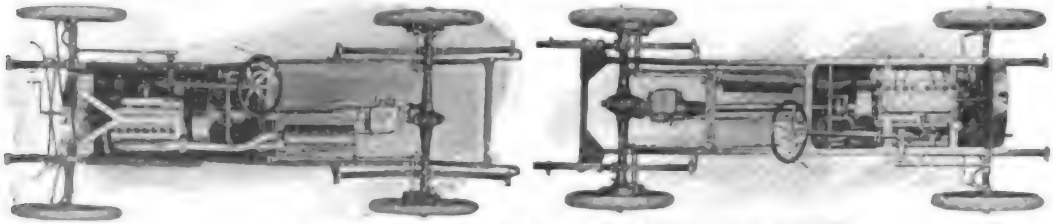
The fifth Regal model is the coupe, which is built on the roadster chassis. The body dimensions are similar to those of the roadster, differing in that it is completely inclosed by a colonial coupe top.

The Motorists' Bookman

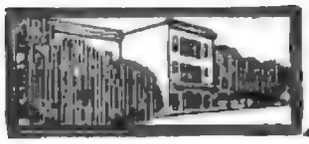
Autocar Road Book, Vol. 3

THIS volume is prepared and presented in the same style as its predecessors, Vol. 1, south of the Thames, and Vol. 2, north and South Wales and west Midlands. Vol. 3 deals with East Anglia and East Midlands—also including parts of Lincolnshire—which, of course, covers the section traversed by the Great North road as far as Newark. Information is given regarding a route by which motorists traveling north or south, desiring to pass to the east of London, may do so, thus avoiding the necessity of going through that city's crowded thoroughfares. The volume is well indexed and a pocket in the back cover contains an excellent route map on fine heavy white linen, the markings and lettering in black being very distinct, while the mileages are shown in red. On the same sheet are maps of the exits from London to the north and northeast, and from the city of Norwich. Published by Methuen & Co., Ltd., London, W. C., Eng. Price $1.85.

Of vest-pocket size, "Rubber Facts and Figures," published by F. C. Mathieson & Sons, London, Eng., contains particularly valuable information for those who are looking for statistical information on the rubber industry. In tabulated form it not only gives data as to the formation of the various rubber companies, shares issued, head offices of companies, but includes the acreage planted to rubber trees, approximate number of trees and number being tapped, amount harvested for 4 years, the dividend paid for the years 1909 to May, 1912, and the monthly outputs during the same period of time.



TOP CHASSIS VIEWS OF MODELS T AND S SHOWING SIMILARITY OF LAY-OUT



Among the Makers and Dealers

WESTCOTT Increases Capital—The Westcott Motor Car Co. has increased its capital stock from $250,000 to $350,000.

May Go to Detroit—It is said that the Globe Seamless Tube Co. has been seeking a factory location in Detroit for some time.

New Duquesne Out—The Pittsburgh Gage and Supply Co., of Pittsburgh, builders of the new Duquesne car, turned out its first finished machine on November 30. It is a four-cylinder, five-passenger touring car. On January 1 the first six-cylinder car will be turned out.

May Need Two Buildings—The Syracuse Automobile Association, of Syracuse, N. Y., announces that the next show will begin Tuesday evening, March 18, and the main show will be held at the Armory. If the number of exhibitors warrants it the Alhambra will also be engaged and two shows held, as last year.

International Commerce Report—International commerce will make a new high mark when the figures for 1912 have been compiled, covering the foreign business of all the nations on earth. Present indications point to at least $35,000,000,000 as the gross amount. This compares with $31,000,000,000 last year and represents an increase of 100 per cent in 22 years. Foreign business in motor cars is reckoned at about $50,000,000.

Miller Reorganizes—The Miller Carbureter Co., which moved some time ago from Los Angeles to Indianapolis, has been reorganized under the name of the New Miller Carbureter Co., which has been incorporated with an authorized capitalization of $200,000. Those interested in the company are Frederick C. Fairbanks, South Pasadena, Cal.; Richard M. Fairbanks, Indianapolis; L. H. Colvin, Cincinnati; O. L. Snyder, Cincinnati, and N. M. Doyle, Indianapolis. The company may establish a new plant at Speedway, the new horseless city, northwest of Indianapolis.

New Cincinnati Firm—Cincinnati is to have a new company to manufacture cars. The Northway Motor Car Co., which was just recently incorporated in West Virginia, with a capital of $600,000, will begin to produce machines about the middle of December. The chamber of commerce is now making an effort to find a suitable location for the company. It is said that if this cannot be accomplished an entirely new structure will be erected. Ralph Northway, of Wyoming, O., will be at the head of the big corporation. W. D. Furste, Edward Deckebach of Cincinnati, F. W. Enslow of Huntington, William Pabodie of Hartwell, O., and Ralph Northway are the incorporators. It is planned to employ 200 men at the beginning. No name has been selected for the car, at the present time.

Denial by C. F. Pratt—Rumors that C. F. Pratt, formerly of the Ohio Motor Car Co., would become vice-president and general manager of the Ames Motor Car Co. are denied by Mr. Pratt. Instead Mr. Pratt is vice-president and general manager of the F. A. Ames Co., another of the Ames group.

New Orleans Chooses March—This year's 5-day New Orleans show will be held March 20-24, it has been decided by the dealers' association after the minority had worked hard for an earlier show. It was decided also to hold two shows each year beginning with 1913. The second show next year will be held in November and will be made an annual feature.

May Choose Indianapolis—In all probability the company being organized by V. F. Whitesides to manufacture a light truck, to be known as the Ironsides, will be located in Indianapolis. Whitesides has announced that he will not consider a proposition to locate in Newcastle, where he was formerly identified with the Whitesides Commercial Truck Co. It is thought the new company will be incorporated and the factory ready for operations early in the new year.

Shortage in Steel Reported—A country-wide steel shortage is having its effect on north end motor car factories in Flint, Mich., it is said. Notice has been received from the steel mills that in order to get delivery on steel it will be necessary to place orders from 6 to 8 months in advance of the date the material is desired. Many of the Flint concerns, such as those manufacturing bodies, radiators, rims, axles and sheet metal parts, have been forced to turn down orders through inability to deliver before next year. It is said the steel shortage is due to the great number of new buildings going up throughout the country.

Haynes Makes Address—The Transportation Club of Indianapolis was entertained on the evening of November 26 with an address on the development of the motor car by Elwood Haynes, of Kokomo. Mr. Haynes told how he conceived the idea of bringing out his first motor car. He said he was engaged in the natural gas business and was forced to make long drives, using a horse and buggy. This caused him to wish for a horseless vehicle. He carefully weighed electricity, steam and gasoline as a propelling power and decided to experiment with gasoline. His motor was built by the Kokomo Machine Works, and the first Haynes car, which is now in the Smithsonian Institution at Washington, ran with considerable success.

Show for Northern Iowa—The seventh annual northern Iowa show under the auspices of the Fort Dodge Dealers' Association is to be held February 26-March 1.

Invading Canada—The Rutenber Motor Co., of Marion and Logansport, Ind., has purchased a factory at Chatham, Ont., in which to manufacture motors for the Canadian trade. W. Bowen, of the Bowen Mfg. Co., of Auburn, N. Y., has been placed in charge of the Canadian plant.

Dealers to Become Bankers—A number of men identified with the motor industry of Boston, headed by Alvan T. Fuller, of the Packard, and John H. MacAlman, president of the Boston Automobile Dealers' Association, have asked the secretary of state of Massachusetts for a charter to do business as a banking and trust company in the Allston district where the big Packard plant is located.

Tire Company Changes Presidents—At the recent annual meeting of the Pennsylvania Rubber Co. Herbert DuPuy retired from the presidency in favor of H. Wilfred DuPuy, who was elected to that office, while still continuing as treasurer of the company. The new office of chairman of the board was created, to which the retiring president was elected. Re-elected to continue in their same offices as formerly were: Charles M. Dupuy, vice-president; Seneca G. Lewis, general manager; George W. Shively, secretary; Charles G. Morrill, assistant treasurer. The readjustment of offices involves no change in the general conduct of affairs.

May Change Classification—The meeting of the southern classification committee will be held in Washington this week and among the subjects that will be considered will be the contemplated changes in the classification of motor cars shipped over southern railroads. The plan proposed by the railroads is to raise the classification of motor cars to double the present rates and to cut down the minimum carload requirements to half the present weights. If adopted the new rule would work a big hardship on the motor car shippers. As an illustration of its working it may be stated that where, for instance, the rate applying between certain points is $1 per 100 pounds with a minimum weight per carload of 10,000, the cost of shipping a car weighing, say, 7,000 pounds would be $70. This is reckoned on the minimum weight at full tariff. If the classification shall be raised to double first-class, or, say, $2 per 100 pounds, with a minimum weight requirement of 5,000 pounds, the shipper would have to pay $140. Of course, if the

motor car weighed only 5,000 pounds or less, the cost of shipment would be the same as it is at present.

Making Chassis for the Trade—The Nichoalds Co., of Detroit, Mich., in the parts business, has gone into the manufacture of the chassis for the trade.

To Make Differential Device—The Gearless Differential Co. has been incorporated in Detroit with a capital stock of $20,000 to manufacture a patented differential device which is claimed to do away with gears for this part of the rear axle. A system of ratchets and rollers is employed. The incorporators are Frank Howarth, G. D. Bailey and W. N. Trudeau.

Providence Show Plans—The plans of spaces for the annual show at Providence, R. I., are out and it provides for 126 spaces divided into two sections, one for pleasure cars and the other for commercial vehicles and accessories. The show will start January 25 and continue until February 1 and it will be under the direction of the Rhode Island Automobile Dealers' Association.

Tone to Build Cars—The Tone Car Co. has been organized and incorporated in Indianapolis with an authorized capitalization of $200,000 to manufacture a line of pleasure cars to be known as the Tone. A factory probably will be established at Speedway, the horseless city. Those interested in the concern are Fred I. Tone, M. H. Miller and William P. Kirk.

New Remy Branch Announced—Gerald Fitzgerald, who has for some time been assistant manager of the branch of the Remy Electric Co. in Chicago, will on January 1 assume the position of branch manager of the factory branch of the Remy Electric Co. to be opened on that date in Minneapolis, Minn. Mr. Fitzgerald will have as his assistant M. C. Kent, also of the Chicago Remy sales force.

Change of Name—On account of similarity to the names of other manufacturers, the Ideal Commercial Car Co., of Akron, has deemed it advisable to change the name of the concern to the Akron Motor Car and Truck Co. The company has recently moved into its new plant, where it has several times the floor space that it had in the old plant, and its facilities for increased production are thereby greatly enlarged.

Willard Still Expanding—The Willard Storage Battery Co., which recently purchased the property adjoining its plant No. 1, affording it 50,000 feet of additional manufacturing space, also has acquired the plant next adjoining it, a building of brick and steel construction, with 32,500 feet of manufacturing space. This furnishes the Willard company with four separate and distinct plants, all conveniently located, close together, but in no way connected. Three are already individually equipped for the manufacture of storage batteries and the most recent purchase is intended to provide for future expansion.

Mineter With Rayfield—N. H. Mineter, who for several years has been sales manager of the Stromberg Motor Devices Co., has resigned his position with that concern and is now associated with the Findeisen & Kropf Mfg. Co., of Chicago, as factory sales manager.

Making Cars in South Bend—The South Bend Motor Car Works, 2101 South Main street, South Bend, Ind., manufacturer of cars, has been incorporated with a capital stock of $10,000. The directors are John D. J. Farneman, Alfred C. Mechlenburg and Hilton Hammond. The company has just recently placed on the market a six-cylinder 45-horsepower car with a 128-inch wheelbase. The incorporation papers were filed with the secretary of state at Indianapolis.

Change in Detroit Concern—The Detroit Motor and Machine Co. has incorporated with $150,000 capital stock, the incorporators being Hal Smith, attorney; Frank W. Blair, president of the Union Trust Co., and H. J. Hayes. Of the capital stock $75,000 has been paid in and the remainder has been represented by property. The incorporators divide the 750 shares of stock equally. The company has operated a machine shop at the foot of Hillger avenue for years and the new incorporation marks a partial change in ownership, together with an increase in the amount of capital.

Guayule Industry Disturbed—The Guayule rubber industry is much disturbed over the activity of Mexican outlaws who are operating upon a number of ranches from which the guayule shrub is obtained, under the guise of rebels. Advices have reached Torreon that the Cedros ranch, embracing 2,000,000 acres, situated in the state of Zacatecas, which is a subsidiary of the Intercontinental Rubber Co. of New York, has been taken repossession of by these pillagers and that the manager and all foreign employes of the property were forced to flee for their lives. The Cedros ranch is the chief source of supply for the large crude rubber factories of the Intercontinental Rubber Co.

New York Concern in Trouble—A petition in bankruptcy has been filed against the Knickerbocker Brass Goods Co., of New York, capitalized at $50,000, and Henry C. Quinby has been named receiver. The company has liabilities amounting to $40,405 and nominal assets of $47,620. These consist of inventory, $2,000; accounts, $4,553, and claims against the United States Motor Co. and the East Side Metal Spinning Co. for about $20,000, each based upon alleged breaches of contracts. The company has been in financial difficulties for some time and foreclosure on its machinery by virtue of a chattel mortgage left a deficiency of $2,000. Claims of the United States Motor Co. and the East Side Metal Spinning Co., amounting to $21,000, either are in litigation or are disputed.

Matheson Hub Branch Closes—The Matheson Automobile Co. has closed its branch in Boston, which was opened by the company more than a year ago, when it took over the agency conducted by Roy Faye. This will throw on the market a fine service building, one of three on Commonwealth avenue, forming a large structure and occupied by the Winton the center and the Locomobile at the other end.

New Canadian Enterprise—Another sign of the wave of prosperity in the maritime province is the notice of incorporation that appeared recently of the Maritime Motor Car Co., Ltd., at Goldbrook, N. B., capitalized at $250,000, for the purpose of manufacturing a medium weight, high-grade, six-cylinder car. The factory, which is almost completed, will have a capacity of over 1,000 cars a year and will cover more than 2 acres of ground, it is declared.

Leverton Cartercar Manager—A. C. Leverton, formerly with the Brush Motor Co., of Detroit, has been appointed general manager of the Cartercar company, succeeding J. J. Hartley, who has been transferred to Philadelphia. A. Lehr, recently with the Studebaker Corporation, has succeeded H. D. Evans as purchasing agent, while W. D. Block, of the General Motors Co., hereafter will be comptroller of the Cartercar plant. E. J. Farkas, engineer of the Cartercar, has left and has opened offices in Detroit.

New N. A. A. M. Bureau—The National Association of Automobile Manufacturers has installed its new car service bureau at Detroit, according to announcement made by James S. Marvin, traffic manager of the association. The purpose of the new bureau is to facilitate the efforts of car makers to secure a supply of freight cars during the shipping season. The methods to be used will be largely precautionary. For instance, when a shipment of motor cars leaves the manufacturing center, the numbers of the cars are listed together with their ownership and official designations. This list is forwarded to the railroad which will make delivery of the freight with a letter requesting the terminal road to protect the cars and to see that they are promptly returned to the railroad from which the shipment originated. A system of daily car reports has been instituted, which will show the location of motor car freight cars and thus tend to decrease demurrage and delay. It has been found that fully 30 per cent of the inefficiency of motor car freight cars arises from the withholding of foreign cars by terminal railroads under the present unsatisfactory system of demurrage. The association hopes to decrease this percentage to a material extent by the operation of the car service bureau in the near future.

Development Briefs

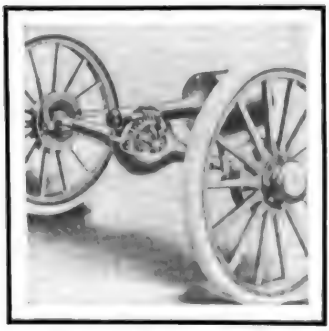


FIG. 1—HINDLEY WORM-DRIVE AXLE

Avery Reversible Electric Lamp

LAMP filaments are liable to burn out at any time and for this reason are not to be greatly relied on for tail lights if used alone. It is inconvenient to carry extra bulbs, as they must be stored in a safe place, which means an inaccessible one. To run without the tail lamp lighted is to court legal trouble, and for this reason many motorists whose cars are equipped with electric light prefer to use oil tail lamps to be on the safe side. The Avery Portable Lighting Co., Milwaukee, Wis., has brought out a new bulb that eradicates this objection to electric tail lights. This lamp has two independent filaments secured to two separate socket plugs. Upon one filament burning out the bulb may be reversed and the other end inserted in the socket.

New K-W Lighting Magneto

The K-W Ignition Co., Cleveland, O., has produced the lighting magneto shown in Fig. 3. It is similar to former K-W magnetos, except that it employs three magnets instead of four. The new model is known as model LS. It will light two 16-candlepower headlights at speeds of from 900 to 3,000 revolutions per minute.

Only one moving part is employed, the rotor, and no commutators, sliding contacts, or brushes are employed. In the usual construction a wound armature is employed which necessitates collector rings and brushes, or a commutator to convey the induced current to the exterior connections. This is eliminated in the new generator by employing a spirally wound coil, C, in Fig. 4, between the inductors, I I. This coil is wound with copper ribbon, the extremities of which winding extend up between the magnets, and out to binding posts at the end of the magneto. The magnet poles extend down to the base of the instrument, the rotor revolving on ball bearings between them. The complete magneto, coil, etc., is completely inclosed and waterproof.

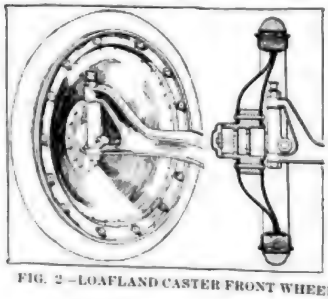


FIG. 2—LOAFLAND CASTER FRONT WHEEL

This magneto is, of course, of the low-tension type, intended for lighting only, but can be furnished with a coil for ignition purposes, if desired. In application, it is usually driven by a friction wheel on the end of the armature shaft, from the flywheel, which gives about the right speed for lighting work. With the inclosed flywheels that are found on many of the new motors, this application is not practicable, a pulley being substituted for the friction wheel, and the magneto driven by a belt from the fan pulley. As shown in Fig. 3, a special spring bracket is fitted to the magneto frame, which serves to keep the friction wheel in contact with the flywheel, or to keep the belt taut.

Loafland Steel Caster Wheel

Caster wheels have become so familiar to most motorists that they need no introduction, their advantages of ease of steering, even wear on the king-bolt, safety, in case of the breakage of a steering connection, and lessened strain on these connections, are well known, and need no explanation. Several types of caster wheels and axles have appeared, from time to time, one having been adopted by a prominent manufacturer of pleasure cars. The majority of these devices, however, have been designed for light cars, and their application to motor trucks has not been seriously contemplated. That their utility in this use is quite as great as in high-speed pleasure-car use has been realized by the Indestructible Wheel Co., Lebanon, Ind.

This company's wheel is constructed of pressed steel, in two disks, flanged at their outer peripheries, and riveted to the wood felloe of the wheel. Their inner ends are likewise riveted to a metal hub, which is wholly outside of the wheel center. The axle and steering arrangements are exactly similar to standard, except that the king-bolts are in horizontal line with the wheel centers. They are slightly ahead of the vertical centers of the wheels, though, thus castering naturally. In motor trucks the tendency of the front wheels to spread on their spindles, i. e., to widen at the bottom, is more marked than in pleasure vehicles, due to the great weight that is borne by the steering spindles when off-center, as in usual practice. By placing them in the center of the wheel this strain is almost entirely vertical, and there is hence no constant tendency to break down or bend the steering knuckles, as in standard construction. Another point that should receive more attention from truck makers and users than those of pleasure cars is the abnormal wear on tires, imposed by the usual steering arrangement. Metals are fallible, and the majority of trucks on the street have their front wheels badly out of line because the position of the king-bolts requires that mechanical means be employed to hold them in line, while with the caster wheel this position is automatically maintained, and the wheels exert no strain on the connections counter to a true running position. Tire wear is greatly augmented by poor wheel alignment, and for this reason a caster wheel is to be recommended for trucks.

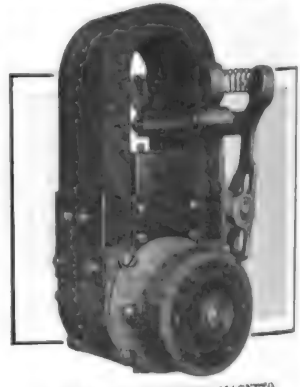


FIG. 3—K-W LIGHTING MAGNETO

Fig. 2 shows an inside and sectional view of this wheel, illustrating the disposition of the steering knuckle.

Hindley Worm-Gear Truck Axle

Fig. 1 shows a type of Hindley worm-gear that is supplied by the Otis Elevator Co., of Philadelphia, to the Commercial Truck Co., of that city. The worm is of special alloy high-carbon steel, and the wheel of Cramp's No. 5 gear bronze. The gear of this axle is 9¾ to 1, the worm is 8 8/10 inches in diameter, with four threads, of 1-inch pitch, meshing with 39 teeth on the wheel, whose pitch diameter is 11 9/10 inches in diameter. The differential gear is mounted within the gear wheel at its center. The worm thrust is taken by double ball thrust bearings, and both worm and wheel are mounted on annular ball bearings. The casing is a special malleable steel casting of one piece, the worm being supported by a removable cover, which permits the inspection or removal of the differential as a unit. It is claimed

Novelties for Motoring

that in the use of the Commercial Truck Co., these gears, of which 100 have been installed, have been given a mileage of 35,000 in four years, being in good condition still.

Ezeride Tire Filler

Southern motorists need no longer send their tires north to be filled, for the Ezeride Filler Co., New Orleans, La., offers a tire filler similar to the northern brands, which may be applied at the factory or any of its branches and agencies. Ezeride is a spongy, rubber-like substance which in spite of its close resemblance is said to contain no rubber. It is claimed to be immune to extremes of temperature, and is said to be proof against hardening or crumbling. It is said to be almost as easy-

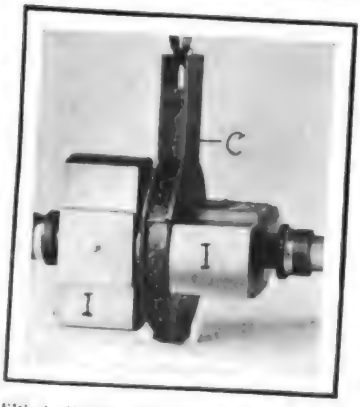


FIG. 4—NOVEL ARMATURE USED ON K-W MAGNETO

riding as air, and may be used repeatedly as the casings in which it is used are worn out. It is claimed to give greater life to tires than is possible when pneumatically inflated because of the impossibility of their ever being run flat, rim-cutting, or blowing out.

It is applied to the tire through the valve, being pumped into the tube, where it soon hardens, and may be used over and over again in new casings. This assures a perfect fit, and simplifies the first application. A novelty is the guarantee that is given. The filler is warranted to last 1 year without losing its shape, flattening, hardening, or in any way changing its consistency, on a basis of renewal, free of charge. It is sold at the usual prices for fillers of this character.

Jackson Air-Compressing Shock-Absorber

Utilizing the power usually lost in resisting shocks to compress air for tire inflation and air-starting, the Jackson combined air-compressor and shock-absorber has been patented by Joseph D. Jackson, Washington, Pa. It consists of a cylinder and piston compressor, geared to a ratchet and pawl action which is linked to a recoil arm. The recoil arm is secured to the axle and the air-compressor to the frame. In passing over severe road obstructions, the compressor is brought into play, storing the air compressed in a tank, the resistance of the compressor reducing the shock to the chassis.

Electric Lamp for Tourists

Open cars have been considered inconvenient by some in that at night the passengers must perforce be content with darkness after the shades of night have fallen. Tourists especially are handicapped by this limitation of the open car, so that night driving becomes an adventure rather than an outing. The Cleveland Electric Storage Battery Co., St. Louis, Mo., has produced a canopy top electric lamp to provide for this contingency. This lamp consists of a brass cylinder, to be screwed to one of the bows of the top, which contains a small incandescent bulb. A cylindrical shutter over the opening for light is provided to adjust the light to prevent dazzling the eyes of the driver. The light need not be removed from the top, but may be closed and folded up with it.

Monahan Piston-Valve Engine

Strongly reminiscent of steam-engine valves, the piston-valve illustrated in Fig. 5 presents several commendable features. The valve is known as the Monahan balanced piston valve, and is used on gas engines manufactured by the Termaat & Monahan Co., Oshkosh, Wis. Unlike rotary and sleeve-valves, this valve remains stationary during the explosion stroke. The action is positive and accurately timed, as with these types, but the linkage is quite as simple as that employed in poppet valves. The shape of the combustion chamber may be made in the ideal dome form, the passage to the valve being small, and hence affording little space for foul gases to lurk. The piston is disposed in a valve-trunk cylinder, and has a very short stroke. It is placed at one side of the cylinder, and opens into it by means of a port. This port is slanted upwards toward the cylinder, so that the indrawn charge is forced upward to the top of the cylinder, in which the spark plug is situated.

The valve-passage is about the narrowed middle of the valve-piston. The inlet and exhaust ports are situated just above and below this passage, with the piston in middle position, as at the time of combustion. The piston is secured at its bottom to a valve rod, leading to the camshaft in the crankcase, as in usual practice. No springs are used, however, as the cam is in the form of an annularly slotted cylinder, which acts on a roller yoke. This motion is longitudinal and is transmitted to the vertical valve-rods by means of

FIG. 5—MONAHAN PISTON-VALVE ENGINE

angle levers. The exhaust passage is at the bottom of the piston-valve stroke, while the inlet is at the top. The inlet is introduced to the valve trunk below the exhaust passage and is led through the hollow piston to the top of the valve cylinder, where it is conducted to the inlet port.

The positioning of the inlet and exhaust ports at opposite ends of the piston balances the action of this member, and therefore enables the actuating mechanism to be quite light and simple. The cams may be cut to give any valve timing, except as to coincidence of valve-openings, which is of course not possible with this arrangement. The engine is especially adapted to the use of low-grade fuels, as the fresh gases are thoroughly heated in passing through the piston to the inlet port. Both ends of the valve trunk may be opened for cleaning and inspection of the valve.

New Sewell Wheel

Improvements in the resilient element have been made in the Sewell cushion wheel, previously described in Motor Age. The new wheel, Fig. 6, differs from the former type, which is still continued for light trucks, in that the rubber tubes which formerly composed the resilient element, have been replaced for heavy service by the blocks as shown. These blocks are zig-zag in form. These wheels have given satisfactory service in use on heavy trucks, especially so in fire service, where the requirements are for resilient tire, that will permit of high speed, and yet a tire that can be relied upon.

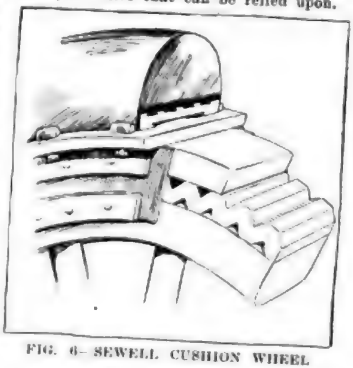


FIG. 6—SEWELL CUSHION WHEEL

Brief Business Announcements

Agencies Appointed by Motor Car and Truck Manufacturers

PLEASURE CARS

Town—	Agent	Car
Aledo, Ill.	E. B. Miller	Moon
Amityville, L. I.	A. R. Quick	Franklin
Audubon, Ia.	A. E. Beason	Rambler
Audubon, Ia.	John Martinson	Nyberg
Baltimore, Md.	Baltimore Garage Co.	Cutting
Boston, Mass.	W. E. Kelton	Cutting
Buffalo, N. Y.	McFarlan-Buffalo Sales Co.	McFarlan
Canton, O.	Auto Service Co.	Moon
Canton, Ill.	Mead McClatchey	McFarlan
Charleston, Mo.	Luke Howlett	Moon
Cincinnati, O.	L. C. Denison	Abbott-Detroit
Clarksburg, W. Va.	Monticello Auto Co.	Cutting
Converse, Ind.	Corn & Sons Motor Co.	Cutting
Denver, Colo.	Havens Motor Car Co.	Cutting
Ft. Wayne, Ind.	Eureka Garage Co.	Cutting
Girard, Pa.	H. C. Duff Garage Co.	Cutting
Grant, Ia.	Grant Auto Co.	Firestone-Columbus
Greenville, N. C.	Greenville Motor Co.	Cutting
Hannibal, Mo.	Long Mfg. Co.	Moon
Indianapolis, Ind.	McFarlan Six Sales Co.	McFarlan
Indianapolis, Ind.	E. M. Holmes	Cutting
Jacksonville, Ill.	Roy W. Corbett	McFarlan
LaGrande, Ore.	Apperson Motor Car Co.	Franklin
Lexington, Ky.	O. R. Crutcher	McFarlan
Los Angeles, Cal.	Benton & Holmes	McFarlan
Madisonville, O.	W. G. Blaney	Franklin
Memphis, Tenn.	Cutting Car Co.	Cutting
Middleboro, Mass.	Middleboro Auto Exchange	McFarlan
Milwaukee, Wis.	W. E. Allen Co.	McFarlan
Minneapolis, Minn.	E. A. Zolle	Pathfinder
Minneapolis, Minn.	J. P. Snyder Co.	McFarlan
Minneapolis, Minn.	MacArthur-Thompson-Zollars Co.	Marathon
Moneta, Ia.	Louis Ruwe	Moon
New Orleans, La.	T. Sydney Weber Motor Car Co.	Page-Detroit
Orange City, Ia.	Aerrote Van Der Wilt	Moon
Petersburg, Va.	Wm. P. Atkinson Co.	Moon
Pittsburg, Pa.	Union Motor Car Co.	Cutting
Punxsutawney, Pa.	J. B. Beam & Son	McFarlan
Saskatoon, Can.	C. T. Clark	Franklin
Sidney, Neb.	McIntosh & Brewer	Franklin
Springfield, Ill.	Hunter Auto Service Station	McFarlan
St. Louis, Mo.	T. J. Moss Motor Car Co.	Borland
St. Louis, Mo.	Lindell Auto Sales Agency	Cutting
Syracuse, N. Y.	Overland-Syracuse Co.	Garford
Syracuse, N. Y.	Hanna Sales Co.	Cutting
Terre Haute, Ind.	S. P. Hall Garage Co.	Cutting
Toledo, O.	Gamble Motor Car Co.	Garford
Toronto, Can.	Automobile Sales Co., Ltd.	Moon
Wall Lake, Ia.	Hopkins & Herrig	Moon
Washington, D. C.	David S. Hendrick	Abbott-Detroit
Washington, D. C.	M. E. Pearson	Century
Wheeling, W. Va.	J. C. Stamp	Cutting
Yankton, S. D.	F. J. Nyberg	Moon
Youngstown, O.	R. P. Wells	McFarlan

TRUCKS

Town—	Agent	Car
Joplin, Mo.	Joplin Supply Co.	Wilcox
Minneapolis, Minn.	Twin City Motor Co.	Mack
Minneapolis, Minn.	Twin City Motor Co.	Hewitt
Syracuse, N. Y.	Overland-Syracuse Co.	Garford
St. Joseph, Mo.	Farmer Auto Co.	Wilcox
Toledo, O.	Landmann-Griffith Motor Co.	Modern
Toledo, O.	Gamble Motor Car Co.	Garford

BROCKTON, Mass.—Charles Martin has purchased the Kelley garage, 389 Warren avenue.

Philadelphia, Pa.—R. Y. Spare has succeeded Robert J. Skilton as manager of the retail sales force of the Oldsmobile company.

Racine, Wis.—The Racine File Co. has doubled its capacity and changed its factory drive to electricity throughout. Much new equipment has been added. The company does a large business with motor car and parts manufacturers.

Mineral Point, Wis.—E. C. Fiedler is building a large garage adjoining the Masonic Temple at Mineral Point, to be occupied by his nephew, Harold Cummings. The building will be 84 by 47 feet in size, with two stories and basement. Mr. Cummings has not yet closed for agency lines.

Racine, Wis.—The Perfects Radiator Co., of Chicago, has moved to Racine and established a workshop at Fifteenth street and the Northwestern tracks. The production consists of motor car radiators, pumps and other cooling devices. Twenty hands are employed and the force will be increased as needed.

Columbus, O.—The Columbus Auto Parts Co., a new corporation recently chartered with a capital of $25,000, has taken over the patent rights and plant of the Columbus Auto Parts and Machine Co. The concern now occupies a large new plant at Russell and Fourth street, which contains 16,000 square feet of floor space. The company manufactures the Columbus windshield.

Brockton, Mass.—The Fisher-Nickerson Motor Car Co. has taken on the Little line for the territory.

Jefferson, Wis.—William Schwartzburg, of Milwaukee, has purchased the garage and agency business of Clarence Puerner at Jefferson.

Chicago—L. A. Bartlett, former sales manager of the Poss Motor Co., has become identified with the Universal Motor Truck Co. in the Chicago territory.

Detroit, Mich.—Carl J. Secoir, purchasing agent of the Havers Motor Car Co., Port Huron, Mich., has joined the forces of the Studebaker Corporation, Detroit.

Greenville, Ill.—The Auto Supply and Sales Co. has succeeded Ed De Moulin. Mr. De Moulin continues as president, with E. W. Miller as secretary-treasurer.

Minneapolis, Minn.—T. C. Connelly, Brookings, S. D., has been put in charge of the Minneapolis branch of the Brictson Mfg. Co., maker of Brictson treads. The company's branch will take care of the Twin Cities. It is at 49 Tenth street S.

Syracuse, N. Y.—The Baker Electric Sales Agency and public service station has located an agency in one-half of the C. A. Benjamin, Inc., garage in W. Onondaga street and will later move into larger quarters. Within a short time there is planned the erection of a large garage and public service station, especially for the accommodation of electric, commercial and pleasure cars.

Minneapolis, Minn.—The Moline Automobile Co. opened its new quarters at 1617 Hennepin avenue.

Baltimore, Md.—Showrooms have been opened at Mt. Royal avenue and Dolphin street by George G. Norwood, agent here for the Velie car.

Springfield, Mass.—The Westfield Motor Truck Co. has filed a petition in bankruptcy with liabilities of $20,616.67 and about $4,000 of assets.

Washington, D. C.—F. W. Robertes has been appointed manager of the local branch of the Locomobile Co. of America, succeeding James J. Flynn, who resigned a few days ago.

Boston, Mass.—Warren T. Walker, formerly with the Locomobile and Matheson branches in Boston, has been appointed manager of the Boston branch of the Kelly-Springfield tire company, succeeding Manager Beach, who has been sent to take charge of the San Francisco branch.

Detroit, Mich.—Smalley Daniels, who has specialized on metal tool boxes among other motor equipment, has become financially interested in a new box factory at Cleveland, O., recently built for this purpose by G. F. Mitchell & Son. Daniels will act as sales manager. The concern will also produce a line of other metal motor supplies, including funnels, etc.

ures, mufflers and drip pans, in addition to a general line of shop boxes, barrels, etc.

Racine, Wis.—The Belle City Brass and Iron Co., of Racine, has commenced work on a large addition.

Washington, D. C.—The Goodrich and Diamond tire depots now located at 1319 Fourteenth street, N. W., will be removed to 1502 Fourteenth street, about December 1.

Providence, R. I.—The Goodwin-Sherman Co., agent for the Studebaker line in Providence, R. I., will move into its new building on Washington street in a few days.

Philadelphia, Pa.—The premises at 206 North Broad street have been renovated and are now occupied by the Eastern Auto Co. Morris Freedman has been appointed manager.

San Francisco, Cal.—Barry Cool, of Los Angeles, Cal., has been appointed manager of the northern branch of the Pathfinder Motor Car Co., with headquarters at San Francisco.

Columbus, O.—The I. J. Cooper Rubber and Tire Co., recently organized, announces the opening of a new tire store at 263 North Fourth street. The company will handle a full line of tires and accessories, including the Racine line, the I. J. Cooper line of solid tires and the Dayton brand of vehicle tires. I. J. Cooper is president of the company.

St. Louis, Mo.—The St. Louis Motor Truck Co. has increased its capital stock from $17,500 to $22,500 for enlarging its mechanical equipment.

Springfield, Mass.—R. A. McKee, who handles the Lozier, Winton and Stutz in Springfield, Mass., has taken on the Mitchell to complete his line.

Kaukauna, Wis.—Peter Versteger has purchased the Hoehne Auto Co. and will conduct the business under the name of the Kaukauna Motor Car Co.

Dayton, O.—P. W. Klinger, who has served the Speedwell Motor Car Co. for some time in the capacity of factory manager, has recently assumed the title of chief engineer.

Providence, R. I.—W. B. Hollander has opened a salesroom and service station at 170 Fountain street for the Metz cars which he is handling there in addition to the Attleboro.

Philadelphia, Pa.—The M. S. H. Sales and Rubber Co. has been incorporated, to deal in tires and mechanical rubber goods, the local salesrooms being located at 660 North Broad street. The officers of the new company are Frank A. Harrigan, president; J. V. Harrigan, vice-president and general manager, and Robert J. Skilton, secretary and treasurer.

St. Louis, Mo.—The Oldsmobile Co. of Missouri now is located in its new quarters at 3205-7 Locust street.

Tacoma, Wash.—The Stutz Motor Car Co. has opened a Tacoma branch at 223 South K street. C. H. Moors is manager.

Bridgewater, Mass.—H. C. White, of South Main street, Bridgewater, Mass., has embarked in the motor business, having taken on the agency for the Overland for this section.

Minneapolis, Minn.—H. J. Mich & Co. have extended their territory for the Franklin to the entire state of Minnesota. The company heretofore had Hennepin county and adjoining counties.

Lowell, Mass.—The Lowell Automobile Corporation, that has handled the Buick at Lowell, Mass., for some years, has taken on the Oakland and the Little cars and will probably add the Chevrolet.

Lafayette, Ind.—The Hoffman-Moore Auto Co. of Lafayette, Ind., is branching out by opening a second salesroom in Danville, Ill., where it will distribute the Ford car. Archa Hoffman, president of the company, will move to Danville and will have charge of the new branch. Samuel C. Moore, secretary and treasurer, will remain at Lafayette.

Recent Incorporations

Albany, N. Y.—Boulevard Chauffeurs' Association; incorporators, Joseph Freedman, J. H. Levy, S. Spiro, M. Barnett, P. Pollner.

Amsterdam, N. Y.—John E. Larrabee Co., capital stock $100,000; to deal in motor cars; incorporators, L. L. Larrabee, W. W. Leavenworth, K. L. Larrabee.

Asbury Park, N. J.—Cress Automobile Co., capital stock $250,000; to do general motor car business; incorporators, L. F. Grice, H. A. White, F. Frank Appleby.

Barnesville, Minn.—Broadway Garage Co., capital stock $25,000; incorporators, E. Leonhardt, G. J. Dahm, G. W. Seefeldt, J. H. Fisch, J. A. Cramer, J. H. Boltz.

Boston, Mass.—Stutz Motor Car Co., capital stock $10,000; directors, J. P. H. Chandler, E. J. Bartlett, D. B. Jefferson.

Buffalo, N. Y.—Empire Radiator Co., capital stock $1,000,000; to manufacture radiators; incorporators, E. B. Green, W. S. Wicks, C. J. Ellis.

Buffalo, N. Y.—Buffalo & Interurban Motor Delivery Co., capital stock $125,000; incorporators, J. G. Berner, W. B. Grandson, C. T. Horton.

Camden, N. J.—Starr Automobile Co., capital stock $50,000; incorporators, F. L. Starr, H. H. Grace, T. P. Curley.

Colonial Beach, Va.—Colonial Beach Motor Co., capital stock $5,000; president, F. W. Alexander.

Chicago—Lakeside Motor Truck Transportation Co., capital stock $25,000; general trucking and passenger business; incorporators, B. B. Dunlap, J. M. Dunlap, E. W. Macavoy.

Chicago—Edgar Motor Delivery, capital stock $10,000, to manufacture and deal in motor cars, machinery, etc.; incorporators, J. Edgar, E. A. Zimmerman, A. L. Myers.

Chicago—Militar Tire Co., capital stock $100,000, to manufacture and deal in tires; incorporators, B. S. Lippincott, B. D. Towne, W. J. Higgins.

Chagrin Falls, O.—Falls Garage Co., capital stock $10,000; to manufacture and deal in motor cars; incorporators, O. S. Gore, T. O. Waits, H. D. Bishop, T. H. Huggett, A. E. Huggett.

Chicago—Chicago Garage Owners' Association; to promote business interests; incorporators, W. L. Rudd, E. A. Wise, H. Salvat, B. F. Campbell and others.

Charleston, W. Va.—Northway Motor Co., capital stock $600,000; incorporators, R. E. Northing, W. Pabodie, W. Trustee, E. E. Deckebach, F. B. Enslow.

Chicago—Buckeye Tire & Repair Co., capital stock $2,500, to lease and repair motor cars; incorporators, A. S. Sinheimer, H. I. Thompson, M. Guthman.

Chicago—Gumprice Motor Truck Co., capital stock $1,000,000; to manufacture motor cars and supplies; incorporators, H. E. Rice, Jr., W. C. Haight, P. Corkell.

Danbury, Conn.—Fillow Auto Co., capital stock $30,000; incorporators, A. H. Fillow, J. W. Juengst, B. M. Fillow.

Des Moines, Ia.—Union Motor Co., capital stock $10,000; incorporators, E. G. Plummer, P. Offill, W. H. Wilkins.

Detroit, Mich.—Gearless Differential Co., capital stock $20,000; incorporators, G. D. Bailey, W. F. Trudeaul, F. Howarth.

Elgin, Ill.—Elgin Motor Co., capital stock $20,000; to manufacture motors; incorporators, E. J. O'Beirne, E. J. Adamek, Charles Adamek.

Evanston, Ill.—Penn Oil Co., capital stock $2,500; to deal in lubricants; incorporators, J. M. Maddle, L. Ladole, L. N. Davis.

Gloucester, Mass.—Twin Light Garage Co., capital stock $10,000; incorporators, J. F. Perkins, F. A. Corliss.

Grand Rapids, Mich.—Peninsular Tire & Rubber Co., capital stock $1,000; incorporators, W. O. Hughart, Jr., G. T. Kendal, H. B. Gillett, T. P. Bradfield.

Greensboro, N. C.—Reitzel Auto Service Co., capital stock $25,000, incorporators, J. H. Reitzel, O. C. Klingman, L. G. Klingman.

Mansfield, O.—Brucker Motor Car Co., capital stock $500; incorporators, J. M. Ottinger and others.

Natchitoches, La.—Natchitoches Livery & Garage Co., capital stock $10,000; incorporators, M. Aaron, J. B. Presburg.

Newark, N. J.—Touraine Motors Co., capital stock $37,500; general motor car business; incorporators, C. E. Van Vlieck, Jr., E. M. Dailey, F. W. Kolk.

New York—Swetland Operating Co., capital stock $18,000; incorporators, E. C. O. Thomas, J. Kahn, R. C. Thompson.

New York—Bradhurst Garage Co., capital $5,000; incorporators, G. Glyn, J. C. Jackson, P. R. Gordon.

New York—Motor Hauling Corp., capital stock $5,000; incorporators, W. G. McGrath, M. B. Sentner, S. B. Kerr.

New York—Kells Motor Radiator Co., capital stock $650,000; to manufacture and deal in radiators and motors; incorporators, H. R. Bingham, A. F. Garbe, C. A. Cole.

New York—Flex-O-Fill Core Co., capital stock $50,000; to manufacture tire filler; incorporators, G. Osborn, L. McCready, M. A. Hobie.

New York—Gilbert-Fulton Corp., capital stock $1,000; incorporators, G. J. Gilbert, O. Gilbert, D. J. Fulton.

New York—Kells Motor Radiator Corp., capital stock $650,000; to manufacture radiators; incorporators, H. A. Bingham, A. F. Garbe, C. A. Cole.

New York—Universal Auto Appliance & Construction Co., capital stock $5,000; to manufacture motors; incorporators, F. W. Darnstaedt, M. J. Leclerc, H. B. Tucker.

New York—Elmhurst Garage Co., capital stock $5,000; incorporators, T. G. Smith, P. J. Testan, M. Testan.

New York—American Commer Truck Co., capital stock $10,000; to manufacture and sell motor cars; incorporators, R. C. Thompson, J. Kahn, E. C. O. Thomas.

New York—Rector Engine Corp., capital stock $150,000; to manufacture motors; incorporators, E. Gore, W. Magowan, B. C. Yeaton.

Niagara Falls, N. Y.—Niagara Motor Car Corp., capital stock $10,000; incorporators, C. E. Cromley, D. M. Hepburn, L. S. Hepburn.

Pittsburgh, Pa.—Hollis Motor Vehicle Co., capital stock $20,000; incorporators, H. F. Wigman, J. P. Caufield, J. R. Krommer, O. A. Hollis, H. F. Wigman, W. McClurg Donley, A. Knabb.

Rockford, Ill.—Schlig Auto Repair Co., capital stock $5,000; incorporators, John H. White, John Schlig, D. White.

Richwood, O.—Scharf Gearless Motor Car Co., capital stock $5,000; to manufacture and deal in motor cars; incorporators, G. W. Wordon, J. A. Scharf, W. H. Siples, H. E. Payne, L. J. McCoy.

Saginaw, Mich.—Garber Buick Co., capital stock $10,000; to conduct a garage business; incorporators, G. S. Garber, E. L. Blake.

Salt Lake City, Utah—Automobile Speedway Co. of Salt Lake, capital stock $100,000; incorporators, O. H. Hewlett, D. C. McIntyre, F. Stauffer, D. W. Adamson.

St. Louis, Mo.—Federal Truck Co., capital stock $10,000; incorporators, A. Baker, M. B. Johnson, C. F. Prescott.

Taunton, Mass.—S. & M. Co., capital stock $5,000; conduct a garage; incorporators, C. H. Morse, F. A. Shaw, R. Morse.

Toledo, O.—Willys-Overland Co., capital stock $25,000,000; to deal in motor cars and conveyances; incorporators, W. Stewart, I. Kinsey, R. R. Scott.

Wilmington, Del.—Ajax Grieb Rubber Co., capital stock $5,000.

The Motorist's Kindergarten

EDITOR'S NOTE—Motor Age is publishing in this department a series of non-technical explanations of the various parts of motor cars for the benefit of the reader who knows nothing about them. The subjects will be dealt with in the most elementary manner, so that the series when completed will form a simple elucidation of the car. The first article appeared October 10, 1912.

Carbureter Action

MANY times in the foregoing articles of this series we have referred to the explosive mixture of gasoline and air which is introduced into the cylinder through the intake valve and which by its burning produces the pressure which drives the piston down. So far, however, nothing has been said as to how this mixture is produced. Gasoline alone will not burn; it requires a certain amount of oxygen mixed with it. The easiest way to supply oxygen to the gasoline is to let it take the oxygen from the air, and each part of gasoline takes ten parts of air to burn it completely.

The air and gasoline are mixed before going through the inlet valve in a device called the carbureter, and the process is called carburetion. It gets this name because the process is that of carbureting the air; that is, mixing with the air, hydrocarbons, as gasoline, kerosene and the other petroleum products are called. The carbureter has two functions to perform, first to break up the liquid gasoline into either a very fine mist of liquid particles or a gas, and to mix this gas or spray with the air in the proper proportions.

The first carbureters were simply a chamber containing cotton wicks which soaked up the gasoline and then gave it off to the air which was drawn through the wicks. These wick carbureters were found to be too slow in action for the modern high-speed engines, so now the gasoline is sprayed into the air as it is drawn into the cylinder. This spray comes through a nozzle called the spray nozzle, but it does not spray all the time; otherwise the gasoline would be running out when the engine was not running. The top of the liquid is kept just below the top of the nozzle so that when the air is drawn past the nozzle the suction of the air draws the gasoline out of the nozzle into the air rushing past mixing with the latter just above the nozzle in the mixing chamber and being carried into the cylinder.

The simplest arrangement of this kind is that illustrated at A, Fig. 11. This shows the air inlet at the bottom of the intake pipe which connects with the inlet port and valve. When the inlet valve is open, and the piston moving downward on its suction stroke, the suction of the piston draws air into the cylinder through the air inlet at the bottom of the intake pipe. In the path of the air is the spray nozzle, so that the gasoline is drawn out of the nozzle and carried with the air through the open inlet valve into the combustion space.

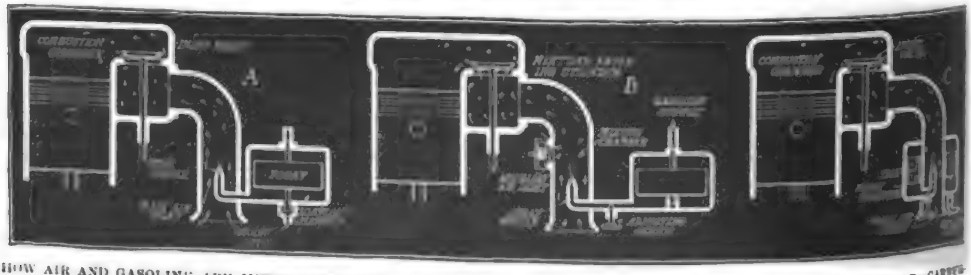
In order to be sure of having the level of the gasoline at the right height in the spray nozzle, this is arranged to be accomplished automatically by a float, in just the same way water is kept at the proper level in house tanks. An air-tight hollow metal float or a cork float is connected with a valve located in the feed line from the fuel tank, called the gasoline inlet. The float rides at a certain height in the gasoline in a chamber called the float chamber. The float and valve in the gasoline inlet, called the float valve, are so connected that when the float lowers with the lowering of the gasoline level in the float chamber, the float valve opens and admits more gasoline to the float chamber; and when the level has reached the required height, lifting the float with it, the valve closes.

If the gasoline inlet is at the bottom of the float chamber as in A, Fig. 11, the float valve can be a very simple one, simply a beveled head on the bottom of a stem which passes through the middle of the float and through the base of the float chamber. The under side of the hole in the base of the float chamber is beveled to form a seat for the float valve. It will be seen that as the float lowers with the lowering of the gasoline level in the float chamber, the valve moves downward away from its seat, opening the gasoline inlet and allowing more gasoline to enter until the float rises enough to bring the valve to its seat, thus closing it.

Sometimes the gasoline inlet is located at the top of the float chamber. In this case the float valve is just as simple, being located on the upper end of the stem through the float and seating against the underside of the top of the float chamber. In all cases there is a direct connection between the float chamber and the spray nozzle, so that the level in the two is always the same. As the gasoline is sucked out of the spray nozzle, lowering its level, the level in the float chamber lowers at the same time. This causes the float valve to open, gasoline flows from the tank into the float chamber and from there into the nozzle until the level of both is at the correct height, when the valve closes.

When the engine is running slowly, the air is not sucked past the spray nozzle as rapidly as it is when the engine is running at high speed. This lower speed of the air past the nozzle sucks less gasoline out of it at low engine speeds, in fact the proportion of the gasoline sucked out of the nozzle to the air taken past it into the engine is much greater at high speeds than it is at low speeds. So if we have the carbureter arranged to give the correct proportions of air and gasoline at low engine speeds, we will have too much gasoline in the mixture at high engine speeds.

(To be continued)



HOW AIR AND GASOLINE ARE MIXED IN CARBURETER AND DRAWN INTO CYLINDER. A—SIMPLEST CARBURETER; B—CARBURETER WITH AUXILIARY AIR VALVE; C—RING-SHAPE FLOAT

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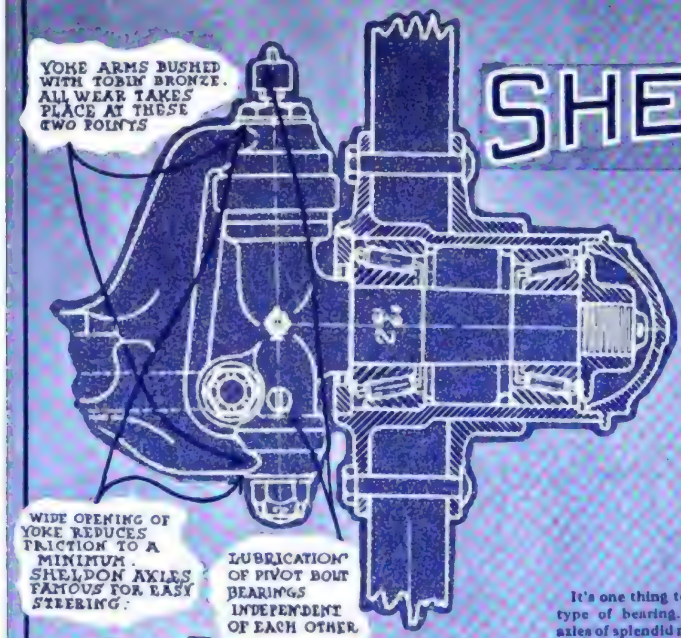
MOTOR AGE

VOLUME XXII CHICAGO, DECEMBER 12, 1912 NUMBER 24

SHELDON



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It's one thing to make axles equipped with one type of bearing. It's another thing to make axles of splendid mechanical construction adapted to every possible use.

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Bower Straight Roller Bearings

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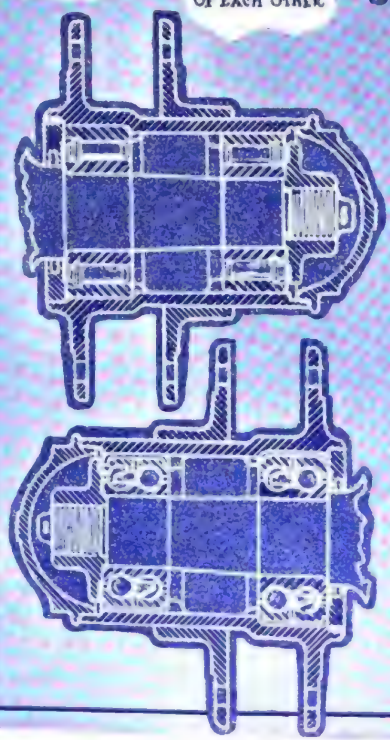
When a man buys a vehicle equipped with Sheldon axles, he is sure that he is buying the most thoroughly scientific axle equipment procurable.



SHELDON AXLE CO.
WARREN PA.

MOTOR AGE

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Contents

DEPARTMENTS

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MOTOR AGE

Spring All the Time in Jamaica

Motor Attractions of Caribbean Island

NORTH SHORE OF JAMAICA LOOKING TOWARD CUBA

JAMAICA the paradise for motorists, beckons alluringly to residents of the bleak north at the time when the leaves have fallen and the sharp winds tell of approaching winter. Jamaica is a fairy and where spring reigns eternally. Its climate is soft and warm the year around and the conditions of life down there in the midst of the blue Caribbean do not require a tremendous output of vitality

in order for men to simply exist. The island has an adequate system of hotels; the British colonial government has enacted liberal laws as applied to visiting aliens and, best of all, the roads of the island, almost 2,500 miles of them, are as nearly perfect in construction and scenic settings as any in the world.

Jamaica Easy to Reach

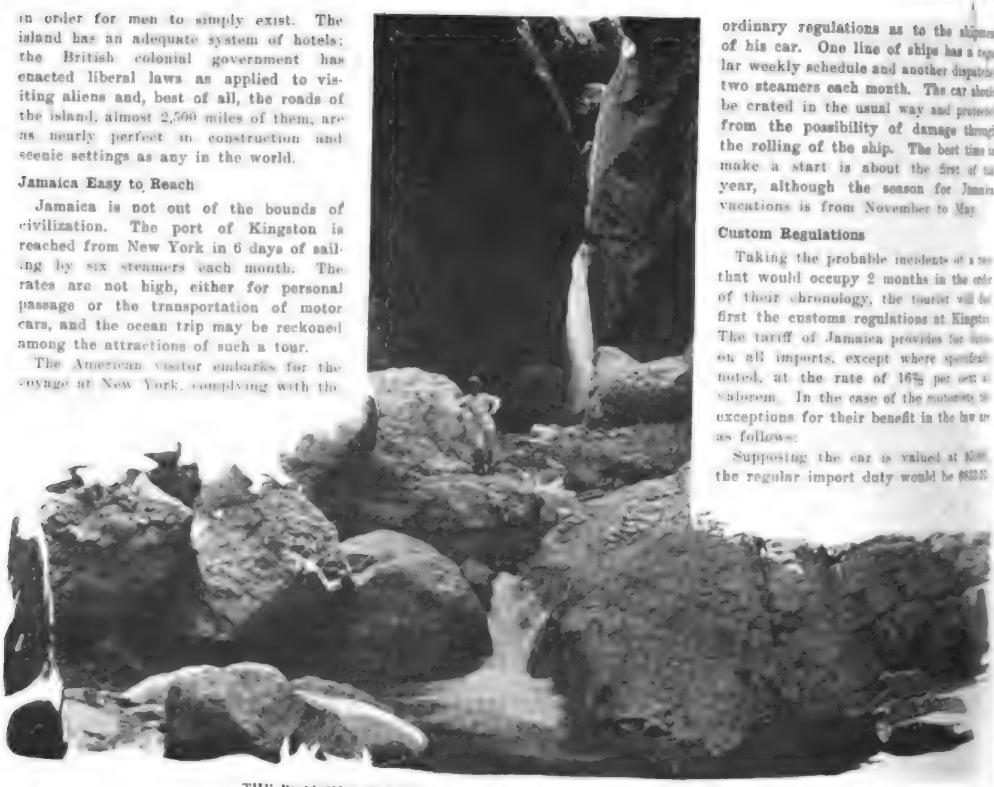
Jamaica is not out of the bounds of civilization. The port of Kingston is reached from New York in 6 days of sailing by six steamers each month. The rates are not high, either for personal passage or the transportation of motor cars, and the ocean trip may be reckoned among the attractions of such a tour.

The American visitor embarks for the voyage at New York, complying with the ordinary regulations as to the shipment of his car. One line of ships has a regular weekly schedule and another dispatches two steamers each month. The car should be crated in the usual way and protected from the possibility of damage through the rolling of the ship. The best time to make a start is about the first of the year, although the season for Jamaica vacations is from November to May.

Custom Regulations

Taking the probable incidents of a tour that would occupy 2 months in the order of their chronology, the tourist will find first the customs regulations at Kingston. The tariff of Jamaica provides for duties on all imports, except where specifically noted, at the rate of 16⅔ per cent ad valorem. In the case of the motorists the exceptions for their benefit in the law are as follows:

Supposing the car is valued at $600, the regular import duty would be $633.33



THE ROADSIDE SCENERY ALONG THE BOG WALK IS ROUGH BUT CHARMING

NEAR MANDEVILLE, JUST BEYOND POINT WHERE RAILROAD ENDS ITS MOUNTAIN CLIMBING

Under the law, if 30 per cent of this amount is deposited with the customs officers, or $250, the car may remain in Jamaica for 2 months from the time of entry without any charge whatever if at the expiration of that period or before, it is shipped away.

Taxes Suspended for 6 Weeks

It may be used on the roads tax-free for 6 weeks. In case the party decides to remain longer than 2 months, the customs authorities charge 5 per cent of the regular duty for each month the car remains after 2 months have passed, up to the limit of the deposit, or 6 months additional to the exempt period. After that time, or if the car should be sold in the meantime, the full duty becomes due.

Personally, the American visitors are allowed to bring in, duty free, personal belongings not to exceed the value of $100 each. Of course there are some specific exceptions, the details of which may be learned at the customs house at Kingston.

but for all practical purposes it shoul remembered that the free limit of im tation is $100 for Americans.

The money of Jamaica is British though American currency is taken pr generally throughout the island. It prove a distinct saving to tourists to change their American money at K ston for British gold, as the excha basis out on the island is reckoned a shillings for $1.

Location of Island

Geographically, the island lies 100 m south of the eastern end of Cuba. It about 140 miles in extreme length by miles across at the widest diameter. shape it is an elliptoid. Through the c tral portion of the island a spineli mountain range towers into the cloudl sky, approaching the south shore at c tain places and ending in huge peaks a bluffs at the east and west ends of t island.

The general topography of the count is rough and marked with series aft

ANOTHER VIEW OF THE BOG WALK, SHOWING RECENT APPLICATION OF BROKEN ROCK

ENTERING THE CELEBRATED BOG WALK ROAD NORTH OF SPANISH TOWN

series of nearly parallel ravines ranging from the interior to the sea. Approaching the island, they give the impression of crinkled paper that is characteristic of many volcanic islands in the tropics. The island lies in 18 degrees north latitude, but its tropical location is much ameliorated by the brisk sea breeze that blows during the part of the day when the sun's rays are hottest. This breeze is known locally as "the doctor," because of its health-giving coolness.

NATIVE WOMEN WHO WORK ON THE ROADS

Kingston on South Side

Kingston, the capital and chief port of the island, is located on the south side of the island, about 40 miles from its eastern end. It is the seat of the colonial government and has a population of nearly 70,000, 90 per cent of which is black or colored. It was founded after the destruction of Port Royal by earthquake in 1692 and grew gradually until within comparatively recent years. The city was practically destroyed in 1907 by an earthquake, but since then it has been rebuilt on lines that render it earthquake-proof. Port Antonio on the north shore has an excellent harbor and there are numerous sizeable places all around the coast line.

Road-building is not a recently discovered and developed art in Jamaica. The highways date back many years before the day of the motor car, although it must be said that since its advent the progress has been very rapid. According to the latest official reports, the highway system of Jamaica includes about 2,500 miles of government—made and maintained roads. There is not a spot on the island that can not be approached by a main stone road, ranging all the way from a broad boulevard to a winding lane over which the palms and bamboos arch like the nave of a cathedral.

One of the favorite trips for visiting motorists is a complete circumnavigation of the island from Kingston and proceeding in either direction until Kingston appears in the distance once more. This trip may be accomplished in 5 days or 5 weeks, according to the desires of the tourists. The Carribean sea is in view practically two-thirds of the time and even when the road runs inland and mounts the sides of the central range, the dimpling ocean of the Spanish main often can be sighted through the tropical verdure.

There are innumerable side trips into the interior that will repay their making and at least a dozen crossings of the island that may be made with pleasure and variation of scenery.

The climate, scenery and roads are the three most important attractions of Jamaica to the motor tourist. The climate and scenery are natural, but the roads are highly artificial.

SCENIC VIEW OF A JAMAICA CANYON, RIVER AND ROAD

Such highways as those of Jamaica would be impossible in any land where there is a season of frost. Consequently the original cost of building very excellent roads that standing for years under mixed traffic is moderate and the cost of maintenance is minimized. In fact, practically all the repair work is done by negro women.

The main highways particularly those adjacent to the cities are as wide as the average highway anywhere, but out in the country the roads are narrow and in some places closely hemmed in by tropical vegetation. As a general rule they are made of broken stone upon which a smooth surface is laid without the use of a binder. The tropical climate has the effect of amalgamating the various elements used in the construction and the result is a smooth surface that carries the traffic with ease.

The chief deteriorating influence is the traffic itself, although the rainy season which is usually at its height in October causes more or less erosion.

The unimportant character of the repair work may be judged from the fact that the current road-building and maintenance fund for the whole system, including 50 miles of new construction, is only $750,000.

All Roads Included

If the new building costs $50,000, the per mile cost of maintenance would be only $280 a mile per annum. Similar service in the United States is over $600 for anything like the same results. The remarkable thing about the Jamaican appropriation is that it is universal and that all the public roads on the island are included in its scope.

Despite the excellent road surfaces common in the island highways, the Jamaicans have provided against high speed in a peculiarly effective way. In the first place the roads are used commonly as walks by the natives and in order to insure their safety the law is stringent as to recklessness in driving. In the second place water breakers are frequent in the hills. These may be traversed without discomfort at moderate speeds but become very destructive if the limit of prudence is passed. Anyway, nobody would want to go very fast on a leisurely tour of the garden spot of the world.

There are about 200 cars owned in Jamaica, most of which are of American manufacture. The inclosed body is distinctly out of place in the tropics, and consequently there is a dearth of limousines in Kingston and elsewhere on the island. Every car should be equipped with a top unless one fancies taking the chance of running into a tropical deluge. Light

waterproofs should be carried on all trips.

In 1911 something like forty motor touring parties shipped cars into Jamaica, showing an increase in this variety of touring of 100 per cent as compared with the season of 1910. During the coming season it is expected that the motor touring parties will number in excess of 100. The sale of cars has shown a large increase each year since 1905, the bulk of the early business being confined to foreign cars. Roadsters of about 30-horsepower rating are favorites with the residents, but the touring car with five or seven-passenger capacity is most common.

Many Gasoline Stations

Fuel, oil and incidental accessories can be obtained at several places on the island. The gasoline stations are located at Kingston, Bowden, Port Antonio, Port Maria, St. Ann's Bay, Falmouth, Montego Bay, Savannah-la-Mar, Spanish Town, and at various other places along the main roads. Complete garages will be found at Port Antonio and Kingston and any ordinary repair work can be done at almost any settlement

As a sort of ground work suggestion to the tourist who contemplates making a trip to Jamaica, the following description of some of the features of a tour around the island is given:

Taking Kingston as a base the party may circle the island, following the south shore to the west. The first objective point is Spanish Town, about 12 miles distant to the west. This ancient place is full of interest. It is located on the Rio Cobre, and a few miles up the valley from Spanish Town is the celebrated Bog walk that has been known for centuries as one of the most beautiful roads in the world. The English corruption of the Spanish name of this road is hardly descriptive of it. The name is Boca del Agua, meaning the mouth of the water, and for over a century it has been called Bog walk, although there is no bog to be seen and the walk part of the name stands for about as perfect a carriage road as can be found anywhere.

RUGGED SCENE IN BLUE MOUNTAINS, 28 MILES FROM PORT ANTONIO

There are numerous attractions otherwise in and around Spanish Town, and the swiftest schedule should allow for the spending of at least the remainder of the first day in prospecting around in the vicinity.

The second day's run may be to Mandeville, skirting the Blue mountains practically all the way. The mileage of the run is only a little over 47, and can be covered in 3 hours of easy running. It is much better to spend 6 hours as the route is through a marvelously interesting country. The course is generally through Old Harbor, May Pen, Colgate, Clarendon Park and Williamsfield to Mandeville. This may be extended almost any length by detours to the coast at Alley or up into the hills to any number of out-of-the-way points. If the direct route is taken there will remain a half day to spend in and around Mandeville. This place is the center of the coffee and orange plantations of the island, and is so high in the Manchester hills that the railroad does not reach it. At that its elevation is only 2,200 feet, and the extreme grade of the motor road is only 6½ per cent.

Climate Is Salubrious

The climate of Mandeville is salubrious. On the coldest night the temperature never falls below 55 degrees and on the warmest day the thermometer has showed 85 degrees. At the height of the tourist season it will be well to arrange for accommodations in advance.

The third day's itinerary carries the tourists through Santa Cruz, passing along the foothills of the Santa Cruz mountains to Newmarket in the western forest coun-

MAP OF JAMAICA, SHOWING MOTOR TRIP AROUND THE ISLAND

try and thence north to Montpelier. This place is the center of the most extensive agricultural district in Jamaica, the Great River valley which extends in a gentle slope for 30 miles to Montego bay on the extreme northwest coast of the island. The direct route as outlined is about 58 miles long.

Run to Montego Bay

The fourth day may be spent in the run to Montego bay and thence along the north coast of Jamaica through Dry Harbor to St. Ann's bay. This is about 67 miles. The next day's run should be to Port Antonio, following the excellent road along the coast for 93 miles. The final run of the trip is from Port Antonio to Kingston by a variety of roads.

The foregoing is only the roughest sort of a suggestion and includes 237 miles. At a pinch it could be done in 2 days without getting into the hands of the authorities. If only 6 days can be devoted to motoring on the island, the main features can be touched. But for a vacation trip of at least 1 month devoted to touring alone in Jamaica, something new and delightful can be found in every hour, providing the spirit of leisureliness obtains all the time.

Following the coast all the way around makes a trip of nearly 500 miles. There are twelve main roads across the island from north to south, and each will give a day of delight to the nature lover.

Special Rate for Motor Cars

There is a special rate on motor cars from New York to Kingston; the charges at the hotels are very reasonable in comparison with the accommodations and also in comparison with the same class of hotels in Cuba; for instance, gasoline is higher in price than it is in the United States, but not emphatically so considering the importation.

To the motorist who wishes to avoid the weather of February and March in the northern part of the United States, it may be said that he could go much further or even stay at home and do worse than visit Jamaica.

There is little of attraction in Jamaica to the business man, as the chief pursuits of the people are stock raising and agriculture and all the actual labor is done by the dark-skinned residents. Therefore it is an ideal place for rest. The hotels at Kingston and Port Antonio are excellent.

To say the very least, the prospect of a week's sail over a summer sea going and returning and a month devoted to touring on the wonderful roads and amid the scenic beauties of Jamaica may well prove interesting.

Detroit Section of S. A. E. Discusses New Slide-Valve Motor

L. B. Brown Explains Details of Swiss Non-Poppet Engine

DETROIT, Mich., Dec. 6—At the regular monthly meeting of the Detroit section of the Society of Automobile Engineers last night, at which sixty-eight were present, a paper by L. B. Brown and descriptive of a new Swiss slide-valve motor was presented. It was productive of considerable discussion. Ferdinand Jehle also read a short paper on a new form of magnetic-absorption dynamometer.

The new Swiss motor, which was brought to this country by Mr. Brown and George Ratcliffe, London, Eng., was designed by Martin Fischer, of Zurich, Switzerland. The Motor and Gear Improvement Co. has undertaken its promotion in this country, and has it in an imported machine which is also built by Mr. Fischer.

Engine Has Seen Service

This particular engine has been put through some 11,000 miles of hard service, and from this experience Brown and Ratcliffe stated to the Detroit section that they could give the information obtained by this actual road use of the engine as well as results of a dynamometer test which was conducted on the Hudson Motor Car Co.'s testing block. Mr. Lewis' paper says in part:

The data obtained through Mr. Coffin and his associate engineers in the experimental laboratories of the Hudson company we lay before you. We shall confine ourselves solely to the description of the motor and data relating to it, and leave the matter of comparison entirely to yourselves.

The motor is a four-cylinder monoblock type, with a bore and stroke of 3 5/16 by 4¾ inches, or to be exact 85 by 120 millimeters, having thermo-syphon cooling, splash and force-feed lubrication, with ordinary high-tension ignition. To this extent the motor is entirely conventional. The special features which make it interesting as compared with other motors are its valve mechanism and its small clearance volume. The cylinders have semi-spherical shaped heads with cylindrical extensions passing through the waterjacket into which the spark plugs are fitted. This construction places the spark plugs in the ideal position and provides convenient means for attaching the waterjacket cover.

By reference to the vertical sectional cut of the motor, you will notice that these cylinders are fitted with two crescent-shaped valve slides, which form a part of the cylinder wall, each one taking up about 69 degrees of the circumference. These slides are mounted on opposite sides of the cylinder. The slides, which are of cast iron, extend the entire length of the cylinder and about 2 inches below it, having at their lower extremity slots for the engagement of the actuating mechanism. Near the upper extremities rectangular openings are provided which register over ports of the same size in the walls of the cylinder. The slides are actuated by box cams, the shafts of which are driven by Coventry silent chains from the crankshaft, so that the movement of the slides is positive in both directions, entirely dispensing with the use of springs and insuring silent action. The travel of the slides is 1 inch, while the height of the ports is ⅝ inch, giving a lap of ⅛ inch.

While the actuating mechanism is somewhat similar to that of the Knight engine, inasmuch as the movement is positive in both directions, the use of box cams instead of eccentrics gives the same cycle as the poppet-valve type, with the characteristic long dwell after the closing of the ports, so that the slides are at rest during the compression and power strokes.

The cylinder heads are removable, having the conventional flange construction for bolting to the cylinders. In addition to the cylindrical extensions to accommodate the spark plugs which are on top of the heads, there also are extensions which project downward into the cylinders, these acting as bull-rings or guides for the valve slides, being intended to hold the latter on their seats. Cored passages connect the cylinder ports to the flanged openings to which the inlet and exhaust manifolds are attached.

In our early experience with this engine, we were at a loss to account for its high power, having in mind its small dimensions, and a great deal of speculation on this point failed to evolve any tangible explanation until the engine was brought here to Detroit, where dynamometer tests and a more thorough examination disclosed certain facts which indicate that in addition to the structural difference existing between this engine and the more conventional types, there are differences in the thermal conditions which make the motor unique. It is doubtless to these features that the relatively high power must be attributed.

The clearance is about 18 per cent of the total cylinder volume, giving a compression which is higher than that in use in general practice. It would seem that this high compression would cause spontaneous combustion, and while we have certain reasons of our own to account for the fact that this does not take place, it is hoped that a discussion on this point will either confirm our reasoning or evolve others. It is relevant to state here that during the several months in which the engine has been under our observation there has been no instance of spontaneous ignition or of overheating.

Another feature which must have a marked effect on the thermal efficiency is the small surface exposed to the combustion temperature. It will be noticed that with the exception of the bull ring, every bit of metal is in close proximity to the cooling water.

Reference to the brake horsepower curve shows that the power increases steadily up to 2,000 revolutions per minute and that it is in direct proportion to the speed up to 1,500 revolutions per minute. You are familiar with the characteristics of brake horsepower curves of poppet-valve types, and perhaps will be interested in comparing these with the curve of the Fischer engine. Comparison with the M. E. P. curve will also be interesting and you will note that the peak in the curve shown is reached at 1,400 revolutions per minute and that it is in excess of 105 pounds throughout the entire range of speed.

Questions Asked and Answered

Mr. Ratcliffe, who collaborated with Mr. Brown in the preparation of the paper and who has had more to do with the operation of this engine than anyone in this country, answered the many questions which were brought up in the discussion of the paper which followed.

It was asked what the reasons for the lack of pre-ignition are, Mr. Ratcliffe answering that the only reason is on account of the perfectly shaped combustion chamber and efficient cooling. It was brought out that the timing is as follows:

Inlet opens 11 degrees after upper dead center.

Inlet closes 71 degrees after upper dead center.

Exhaust opens 63 degrees after lower dead center.

Exhaust closes 19¾ degrees after upper dead center.

This timing is not standard, as the inlet and exhaust overlap about 8 degrees and it was thought that increased power should be the result.

E. R. Fried brought up the question of cylinder wall expansion, stating that in his opinion it would be uneven, due to the fact that the wall is exposed to the cooling for about 220 degrees, while the rest of the circumference is covered by the valve. Mr. Fried further stated that the sleeves also would not expand evenly.

To refute these statements, Mr. Ratcliffe cited the examination of the cylinders when the engine was recently taken down at the Hudson plant. The micrometer tests showed that the cylinders were not of true round only a negligible amount

Several additional facts were brought out as follows:

Dwell on compression, 149 degrees.
Exhaust opening, 262 degrees.
Port area, 7 square inches.
Fly wheel diameter, 16 inches.
Port width, 1⅛ inches.
Oil consumption, 1 pint to 160 miles.
Gasoline consumption, 20 miles per gallon.
Total loaded weight of car, 4,300 pounds.
Piston displacement, 12 per cent less than that of Ford engine.

The question of machining was discussed, and it was further pointed out that the lack of additional data was due to the short time which the promoters have had for this work. A long block test is soon to be conducted by the Automobile Club of France.

In presenting a short paper on Garland's magnetic absorption dynamometer Ferdinand Jehle spoke in part as follows:

The theory is: A copper disk is made to revolve in a variable magnetic field. This sets up currents in the revolving conductor which short-circuit themselves and generate heat. The heat is carried away by the cooling water.

The whole machine is supported on two large ball bearings. The friction in these bearings is the only thing not recorded by the scales. The disk is supported by two ball bearings. One of them takes the radial load and the other keeps the disk from moving laterally, and thus keeps the distance between it and the pole pieces constant.

By properly determining the number of turns of wire in the coil, the size of air gap, between the disk and the pole pieces, the number of pole pieces, and the diameter of the disk, the torque can be made anything we please and its maximum can be put at any speed we may desire to have it. Of course this must be determined by the designer. It is immaterial which way the disk rotates, hence it can be used equally well for motors rotating in either direction.

This particular machine was designed to absorb 100 horsepower at 2,000 revolutions per minute and is no doubt the best for general motor testing. The torque curve of this machine was made to actually fit the torque of motor car motors. Figure III shows the torque as well as the maximum and minimum horsepower curves which the dynamometer can handle. An examination of these curves will show that the characteristic curves of motors will always fall well within these limits. Figure IV shows two torque curves, one or the other of which may always, as far as the writer knows, be expected of a dynamometer depending upon the resistance of a fluid. Similar curves for the electric cradle type dynamometer were not available.

The instrument is provided with an arm measuring 15.756 inches. This makes the horsepower constant 1.4000. If desired, however it is furnished with a scale reading directly in pounds at 1 foot radius. This is by far the best, since it greatly facilitates the computing of results.

The magnetic absorption dynamometer, outside of being used in the experimental department for testing assembled machines. More and more the road test is giving way to a dynamometer test of the complete car. In some cases electric cradle dynamometers have been used very successfully for this purpose. The magnetic absorption dynamometer would handle this very well and require much less room than the electric. The maximum current required is 34 amperes, direct current, at 220 volts.

If a motor is to be used in a truck or if we expect to use it for climbing hills on high speed, it must be able to exert a torque of large magnitude at comparatively low speeds. It therefore is important that we study very carefully the operation of motors under full load at speeds from about 200 revolutions per minute to about 600 revolutions per minute. For this purpose we must have a suitable dynamometer. The magnetic type will handle this particular feature very nicely. Even the electric cradle type is not entirely satisfactory at very low speeds.

Big Crops in Texas Mean Prosperity for the Car Dealers

Farmers Flush With Cash and Agents Are Behind in Orders

AUSTIN, Tex., Dec. 10—Never in the history of the motor car business in Texas has there been such a demand for the vehicles. This condition is said to prevail in every part of the state and is due to the unusual prosperity of the people.

Nearly every agency is far behind in filling its orders for cars. As an illustration of the situation it may be pointed out that in one town in south Texas which has a population of fewer than 3,500 people there are now 120 privately-owned cars by citizens and orders have been placed during the last few weeks for eighty more, deliveries of which are to be made as rapidly as the agencies can be supplied.

Better Business Ahead

Dealers anticipate a still greater increase in business during the winter and spring months. The fact that mild weather prevails throughout the winter season in nearly all portions of the state makes the sale of cars a continuous business and usually the orders are greater during the cold weather period than in the summer season.

Crop results are responsible for the present heavy sale of motor cars. Cotton is still moving to market at a lively rate and indications point to very little of the staple being in the hands of farmers at the end of this year. Picking is still going on in some localities in northern and western Texas but the harvest may be considered to be practically over.

The steady marketing of the crop has enabled the local banks to come through the season without making the large loans which have characterized former years when prices were low and the holding movement strong. No trouble was met with in financing the crop this year and the general satisfaction that is expressed not only among farmers but by bankers and business men generally at the outcome of the crop season makes it certain that every effort will be made to conduct the marketing in a similar manner in the future.

While there was an effort made to organize a holding movement among farmers to bring the prices up to a minimum of 15 cents per pound it met with very little encouragement. Through the disposition or their product at good prices farmers not only have much more money than usual on hand but this condition also applies to the banks as is reflected in the showing of the deposits. Beneficial effects are also felt by the merchants and in all lines of industry in the state.

There is some complaint of the low price that was received for cotton-seed, but there is no remedy for this dissatisfactory feature of the cotton-growing industry. While charges have been made that the cotton-seed oil mills of Texas are in a trust and combine and that they have placed the price of seed very far below what it should be, investigations into these alleged unlawful acts on the part of state authorities have not supported the charges, it is said.

Possible Cotton Crop

It is a little early to talk about the probable acreage of cotton in Texas next year, but there promises to be a considerable increase over the acreage of 1912. This increase will be due largely to the opening up of new lands in western Texas for agricultural purposes. All of the western half of Texas is rapidly filling up with farmers, and instead of being a region that was only fit for cattle grazing purposes, as was formerly thought, it is beginning to produce enormous crops of cotton and a variety of other products.

In the so-called recognized cotton-growing belt of Texas the crop diversification idea has taken a strong hold among the farmers and this is bringing about some reduction of the cotton acreage year by year. It is found that instead of devoting the land exclusively to cotton farming it can be made much more profitable by growing a variety of other crops mixed with hog and other live stock and poultry raising. In south Texas, particularly along the gulf coast and in the lower Rio Grande valley, crop diversification is now a well established principle upon nearly all the farms.

Crop Prospects

Just now the principal growing crops are Bermuda onions and cabbages. There is a considerable increase in the onion acreage in the different districts of south Texas. The live stock industry of Texas is entering the winter season in excellent shape. Late and generous fall rains throughout the grazing territory placed the range in fine condition for carrying the cattle through the winter.

MINNEAPOLIS CLUB ELECTION

Minneapolis, Minn., Dec. 10—The annual election of the Automobile Club of Minneapolis resulted: President, H. J. Clark; vice-presidents, W. P. Devereux and T. N. Kenyon; secretary, G. Roy Hill; treasurer, J. H. Prior; trustees, H. J. Clark, A. W. Strong, W. S. MacCartney, G. K. Belden, W. E. Satterlee and George A. Rose.

IOWA WANTS A MILLION

Des Moines, Ia., Dec. 9—Iowa good roads enthusiasts will ask the coming session of the Iowa legislature for an appropriation of $1,000,000 for good roads. This week petitions were mailed from Des Moines to every car dealer in the state to secure the names of signers to present to the legislature.

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You Pay the Bills

ARE you keeping your motor truck constantly moving during the working hours of the day, or is it wasting 45 per cent of the day waiting in line to reach a loading platform, waiting in front of the dinner-saloon, or waiting at your loading platform to receive the packages which are being delayed because of your lax internal system of handling your commodities?

DO you know if the drivers of your trucks are overloading them to the extent of 50 per cent. or 100 per cent.?

DO you know that while some truck manufacturers advertise their machines as capable of carrying 50 per cent. and as high as 75 per cent overload, that the vehicles are like human beings: overload them and you prematurely wreck them.

DO you know if your trucks are being over-speeded when loaded or unloaded? In other words, have you a positive knowledge that your drivers are operating your vehicles at a pace in accordance with the speeds advocated by the National Association of Automobile Manufacturers and approved by many of the manufacturers?

DO you know if your drivers are selecting the smoothest routes over which to drive your trucks when loaded and unloaded? Or, in a word, have you co-operated with them in a study of street conditions, with a view of obtaining the greatest possible mileage from your tire equipment?

DO you know if your drivers are taking rational precautions to protect the tires by way of slowing up when crossing rough street car tracks, reducing speed on rough brick pavements, cutting down speed on worn-out asphalt streets, avoiding sharp rocks or street car track intersections where the rails are worn to fine edge? In a word, do you realize that it only calls for one serious offense in any of these respects to damage a solid rubber tire so that its period of usefulness is cut down 30 to 50 per cent.?

DO you know if your motor trucks are being inspected regularly by some efficient mechanic who is competent to judge if the motor is operating properly; if the gearset is in condition; and if the running-gear parts are intact; and who can discover the symptoms of pending troubles and so using the stitch-in-time method save you thousands of dollars per year in truck maintenance if you are operating a fleet of vehicles?

DO you know if your drivers and helpers are using the most expeditious methods of loading and unloading? Or are they consuming double the time that your business rivals' drivers require to load and unload?

If Not, You Pay the Bills

YOU may imagine that 5-year guarantees, that 7-year guarantees, and that guarantees for life are protecting you.

You are mistaken.

Your deeds are on your own shoulders.

The rational manufacturer's guarantee will protect you from poor material, and perhaps defective workmanship; but the control of your driver, the loss of time in loading and unloading, the selection of rough streets, overloading, over-speeding, cruelty to tires, lack of daily inspection, fall without the pale of such guarantees. They fall on your shoulders and you must pay the bills.

The Accessory Age

THIS is the accessory age. The car buyer wants a ready-to-run machine; that is, a machine equipped not only for fine weather but for wet weather, not only for dry roads but for muddy, slippery roads, not only for sections where speed is not a factor supervised by the police but where it is; in fact, this is a rational age in which the buyer wants the car equipped for all touring conditions and for all emergencies.

THE wise manufacturer has been the one quick to realize this. There have been several of such. Such manufacturers have, during the last year or so, sold their output largely on the accessory equipment. Some were quick to realize the landslide towards self-starters a year ago and greatly facilitated the movement of a year's product by a strong equipment. Other makers, endeavoring to compete in the same field were called upon to delay announcements until they, too, had equipped their cars to meet this latest demands of a fastidious public.

THERE are today a few makers who still do not fit self-starters. They hope to dispose of a product on its inherent features of motor, gearset and running gear design. This is a lofty purpose and should receive its reward. Nevertheless, it is a fact that a good self-starter is a potent selling factor because every time a car is started it must be cranked, unless the driver is fortunate enough to utilize the energy of explosive mixture in a cylinder by the starting mechanism of the magneto.

THIS is a rational age. The car owner wants the least possible bother. He wants to avoid walking into the muddy street to crank the car if such is possible. He wants to avoid the possibility of a back kick, and while it is an undisputed fact that a great many of the 1912 self-starters gave anything but 90 per cent. efficiency, it is nevertheless a fact that the public has had a taste of the value of self starters and will not be satisfied until a 100 per cent. product is added. Those manufacturers, who see the situation otherwise, had better trim their sails in accordance with public demands, because where they are rational they are going to be the eventual winner.

NINETEEN-THIRTEEN is going to be the keystone in the equipment arch. Scarcely a car is listed for next year without full equipment with the possible exception of self-starters and electric lighting. The buyer wants the complete-equipped car. He wants to buy it ready to run. He wants to buy it in this condition because it is economy to him. It saves him much time, and possibly much money. The buyer purchasing the non-equipped car is confronted with a herculean task; top, windshield, speedometer, clock, anti-skid devices, head lights, etc., all stare him in the face. It calls for time to select what is best suited for his car; it calls for much more time to wait and have these fitted; and after they are fitted there is still the dominant feeling that the buyer looks to the car maker, the top maker, the windshield maker, the speedometer maker, the lamp maker, etc., for the ultimate satisfaction that he desires.

CONTRAST this with the mental equanimity of the buyer of the fully equipped car. He realizes that the work is done under the supervision of the seller, probably the manufacturer. He has the assurance that this manufacturer has at least selected equipments well suited for the machine. He can look to the manufacturer to stand back of the equipment. This is mental economy, and a good one.

Massachusetts Takes Its Motor Census

Bay State Makes Comparisons Between 1912 and 1913

BOSTON, Mass., Dec. 7—The Massachusetts highway commission closed its fiscal year November 30, and now it is possible to get some idea of the great increase in the motor industry here during 1912 as compared with 1911.

With nearly $650,000 received by the commission from the motorists this year, and averaging up the value of taxes paid by owners to local municipalities as reaching about $1,500,000, some of which of course must have been spent on roads, without including manufacturers' real estate taxes, etc., it shows that it would be possible from the motor industry alone in the Bay state to build at least 200 miles of state highway. This is nearly 25 per cent of the total mileage in the state now, a mileage that has been under construction for some 15 years. The gain in the number of cars shows a jump of more than 10,000, while the increase in fees represents something like $140,000 more.

In 1911 there were 38,907 cars registered from which the commission got $380,760, while this year 50,132 machines were put on the books for which $492,482.50 was collected. This shows that the big revenue of course comes from the motor cars. The manufacturers and dealers helped to swell the fund, too, for last year, with only 870 of them, the state got $24,849, while for 1912 the figures show a gain to 1,114, from which $27,157.50 was secured. This does not include $5,000 for additional number plates for dealers.

Next in importance in revenue comes the operators' licenses that brought in this year $29,386, compared with $22,122 in 1911. The renewals of licenses was good for $16,127.50 this year, against $12,672.50 last year. The chauffeurs poured in $11,140 for licenses and $7,063.50 for renewals, while a year ago the figures were $8,366 and $5,680.50 respectively.

Then there were the examinations that were good for $14,036, while in 1911 $12,274 was received. The increase averages about 25 per cent all along the line and the figures are worthy studying by anyone who has an idea that the motor industry has reached its top notch and that the sales are dropping off.

In looking over the figures it shows that the low-powered cars, coupled with the medium-powered ones, are the more numerous. Of course this is to be expected, for the prices of many cars are graded according to the power. It is somewhat of a coincidence to find that this year there were within a few hundred cars rating under 30 horsepower registered as there were of all classes a year ago. The cars under 20 horsepower getting the $5 rate totaled 15,774. Those between 20 and 30 getting the $10 rate numbered 22,265.

So of the 50,000 machines nearly 75 per cent figure in the lower and medium-powered classes. And it is this very thing that stands as a barrier as against the raising of the fees as contemplated a year ago and which will be tried again this year, for the motorists who would pay the greater portion of course would be the owners of the smaller cars.

The chauffeurs, too, form no small portion of the community now that aid the state by handing over money. This year, with $32,239.50 taken from them, and more than $25,000 last year, it helps out a lot.

MASSACHUSETTS' INCREASE IN MOTOR CAR REGISTRATIONS

Comparative figures showing the increase in registrations and finances from the motor industry in the Bay State in 1912 over that of 1911:

	1911	1912	1911	1912
Motor cars	38,907	50,132	$380,760	$492,482.50
Motor cycles	3,685	5,034	7,030	9,640
Manufacturers-dealers	870	1,114	24,849	27,157.50
Operators' licenses	11,561	14,693	22,122	29,386
Chauffeurs' licenses	4,183	5,570	8,366	11,140
Operators' renewals	25,345	32,255	12,672.50	16,127.50
Chauffeurs' renewals	11,361	14,127	5,680.50	7,063.50
Examinations	6,137	7,018	12,274	14,036
Miscellaneous cash	.....	.....	3,663.95	9,200.44
Fines	—	—	28,744.50	29,108
Totals	.....	.....	$504,162.45	$645,344.44

ALL THIS TO BE A SWEEPER

Paris, Nov. 27—There is no room for green hands in the motor street sweeping service of the city of Paris. The government driving license, delivered after a practical examination, is the least important of the requirements, for while it is considered necessary that the operator should be able to drive mechanical skill is considered of still greater importance.

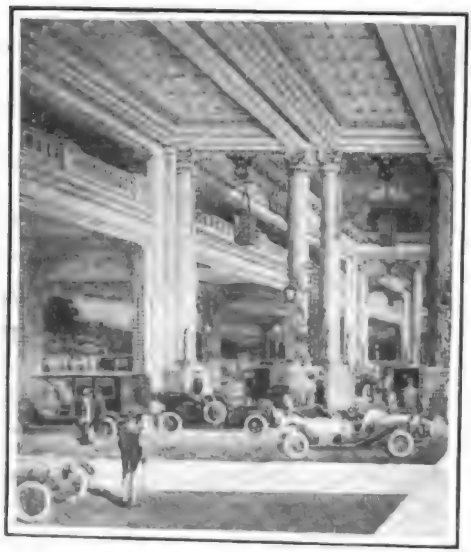
In order to be admitted to the ranks of the motor street sweepers all applicants must successfully pass the following tests: Forge a small part, according to drawing supplied; solder; adjust and assemble various forged parts, bearings, pulleys, flywheels, crankshafts, transmissions, gearsets, ball-bearings, etc.; case hardening, brazing, soldering, the making of pipe joints for motor cars; complete dismounting of a gasoline motor, assembling same and tuning up; fitting various kinds of lubricators, also cooling systems by pump and thermo-syphon and with and without fan; fitting and regulating a carbureter for gasoline or benzol; fitting and regulating an ignition system by magneto or storage batteries; fitting and regulating a clutch; change certain parts in a gearset and a differential; assemble and regulate brakes and steering gear. Finally, the candidates must find the causes of a breakdown in a motor and remedy them and also show their ability to verify the condition of a machine before taking it out.

Arrangements have been made by the Paris municipality for the gradual displacement of all horse-drawn vehicles for street sweeping and watering.

Coming Motor Events

SHOWS

December 7-22—Paris salon.
December 16-21—Seattle, Wash.
January 2-10—Importers' Salon, Hotel Astor, New York.
January 4-11—Cleveland.
January 4-11—Montreal.
January 11-18—New York pleasure car show; Automobile Board of Trade; Madison Square Garden and Grand Central Palace.
January 11-18—Milwaukee, Wis.
January 11-22—Brussels, Belgium.
January 20-25—New York truck show; Automobile Board of Trade; Grand Central Palace and Madison Square Garden.
January 18-25—Philadelphia pleasure car show.
January 21-26—Toledo show.
January 25-February 1—St. Johns, N. B.
January 25-February 1—Providence, R. I.
January 25-February 1—Montreal, Canada.
January 27-February 1—Ottawa, Ont.
January 27-February 1—Scranton, Pa.
January 27-February 1—Detroit.
January 27-February 1—Buffalo, N. Y.
January 27-February 1—Philadelphia truck show.
February 1-8—Chicago pleasure car show; National Association Automobile Manufacturers.
February 3-8—Washington, D. C.
February 10-15—Chicago truck show.
February 8-15—Hartford, Conn.
February 10-15—Minneapolis.
February 12-15—Geneva, N. Y.
February 15-22—Newark, N. J.
February 15-22—Albany, N. Y.
February 16-23—Richmond, Va.
February 17-22—Kansas City pleasure car show.
February 20-22—Canandaigua, N. Y.
February 24-March 1—St. Louis, Mo.
February 24-March 1—Memphis, Tenn.
February 24-March 1—Cincinnati, O.
February 24-March 1—Omaha, Neb.
February 24-27—Kansas City truck show.
February 26-March 1—Fort Dodge, Ia.
February 26-March 1—Glen Falls, N. Y.
March 1-8—Pittsburgh.
March 3-9—Des Moines, Ia.
March 8-15—Boston pleasure car show.
March 11-15—Des Moines truck show.
March 12-15—Ogdensburg, N. Y.
March 18-22—Syracuse, N. Y.
March 18-22—Truck show, Buffalo, N. Y.
March 19-26—Boston truck show.
March 20-24—New Orleans, La.
March 24-29—Indianapolis.



HOW GRAND CENTRAL PALACE WILL LOOK AT SHOW TIME

BOTH as a spectacle and as an exhibit of what is best in motor car and accessory manufacturing the show in Grand Central palace and Madison Square garden will eclipse any affair of its kind held in New York. On the walls of the main floor of Grand Central palace will be several Long Island scenes, a view of the magnificent Delaware water gap, views in the Berkshires, and paintings of scenes along the Hudson near West Point. On the mezzanine floor, western views will be found including the Grand canyon of the Colorado, gorges and passes in the Rocky mountains, California vistas, sections of the cattle country and prairies. The balcony will be devoted to the sunny south and paintings of the beach at Ormond, Fla., where numerous world's speed records were made, Savannah and other Dixie points of interest will be depicted. These paintings will adorn the walls about the picturesque pergola setting in which the cars are to be shown. There will be much trellis work, flowers in profusion, and a general outdoor atmosphere in which the cars will show to advantage. On the main floor and mezzanine floors of the palace will be complete vehicles, while the balcony will house accessories, and motorcycles. The signs with the exhibitor's name at each booth, will be uniform—neat lettering of modest proportions being used to make the effect dignified and artistic. Similar arrangements are being made for the accessory floor.

On the Minor Circuit

Milwaukee Forms New Corporation to Promote Its Annual Show—Detroit and Baltimore Set Dates—Winnipeg Unable to Get Hall

MILWAUKEE, Wis., Dec. 11—The fifth annual Milwaukee motor show, to be given in the Auditorium from January 11 to 17, inclusive, will be under the auspices of the Milwaukee Motor Show Association, a new corporation. Blank applications for space have just been issued. The show will open on Saturday night, January 11, at the same time that the national pleasure car show opens in New York, and will close on Friday evening, January 18.

The first two shows were conducted by the Milwaukee Automobile Club, which relinquished to the Milwaukee Automobile Dealers' Association in 1910. The M. A. D. A. gave the shows in 1910, 1911 and 1912. The new corporation is organized by members of the M. A. D. A.

The exhibit space this year has been enlarged to take in every inch of room provided by the mammoth Auditorium building, including the main arena, stage, rest rooms, balcony, thirty wardrobe compartments, Juneau, Kilbourn, Plankington and Walker halls, the Fifth street lobby, the annex, the entire basement and part of the cafe, a total of 72,000 square feet of show space. Bart J. Ruddle will manage the show.

DETROIT ASSIGNS SPACE

Detroit, Mich., Dec. 9—Sixty firms drew for space at the twelfth annual show to be held at the Wayne Pavilion and Annex January 27 to February 1 next. Of this number forty-three will exhibit cars, while seventeen will show parts and sundries. The forty-three exhibitors of cars will show at least sixty lines of cars of different manufacturers.

It is a noteworthy fact that in spite of the material enlargement of the annex for the show of 1913 by the construction of the building not only to cover the vacant lot back of the Wayne hotel but across Front street as well, giving 10,000 more square feet, there was not sufficient space to satisfy all.

SHOW GIVEN TO INDIVIDUAL

New Orleans, La., Dec. 11—After much discussion as to whether the dealers' association would handle all arrangements for the show or whether the management should be allowed to go to the person making the best proposition was decided by awarding the contract to T. C. Campbell. All decorations and allotments of space will be in his charge.

BALTIMORE SETS DATES

Baltimore, Md., Dec. 9—The Baltimore motor car show will be held this winter from February 18 to 22, inclusive. The show will be combined, the pleasure and commercial cars to be exhibited at the same time. The show will again be under the auspices of the Automobile Club of Maryland and the Baltimore Dealers' Association.

WINNIPEG ABANDONS SHOW

Winnipeg, Man., Dec. 7—The need of some large auditorium in the city of Winnipeg has again been demonstrated when at a meeting of the Motor Trades Association, held recently, it was decided that it would be impossible to hold a show in February next, on account of its having been found that suitable floor space could not be had.

WASHINGTON'S PLANS

Washington, D. C., Dec. 8—Plans for the motor car show scheduled for February 5-8 are progressing satisfactorily, despite the fact that sixteen of the leading dealers have declined to take part. Chairman T. Oliver Probey claims that more than one-half the space has been sold, it being understood that a number of outside concerns will take space in order to introduce their cars here and thus pick up an agent. A portion of the hall will be devoted to an exhibit of trucks. T. A. Garlock has been elected secretary of the show committee.

The opposition dealers, who are planning a carnival or opening week February 10-15, are going ahead with their arrangements.

FOREIGN CARS WILL BE SHOWN

Montreal, Quebec, Dec. 7—A feature of the Montreal motor car dealers' show, to be held January 25 to February 1, will be the extraordinary number of electric cars and trucks to be on exhibition at that time. Another feature of more than ordinary interest is the number of high-class foreign and English cars that will be on view at that time. Hitherto the average Canadian has had little opportunity of comparing the average American or Canadian car with the best type of foreign make.

Two hundred and fifty motor cars, 150 of the pleasure type and forty trucks will be on exhibition at the show to be held under the auspices of the Automobile Club of Canada during the week of January 4 to 11.

SETTLING ATLAS AFFAIRS

Indianapolis, Ind., Dec. 9—Fred C. Gardner, receiver for the Atlas Engine Works, has been authorized by the superior court to distribute the funds in his possession. In the final settlement the common and preferred stockholders will get nothing and the bondholders of a bond issue of $1,050,000 will have to look to the prop

MADISON Square garden will have a suitable setting for the products to be exhibited there. The show committee termed it the Crystal palace, because of the fact that many thousand square feet of mirrors are to be used on all sides of the building. By the use of the mirrors an effect of spaciousness will result. The complete scheme of decoration, however, for the garden has not been decided upon. The big girders of the building will not be covered by a big rug as was the case last year, but will have a more pleasing sky of blue material, soft and fluffy. The ornate lamp posts will again be used to mark off the exhibits. Lattice work will predominate in the structural treatment of the garden. Three mammoth crystal chandeliers and about thirty smaller ones of rich design will hang pendant from the dome, while along the railings and balconies garlands of flowers will hang in rich profusion. There will be a number of allegorical statues along the main floor which will front the pillars that support the elevated platform. As in the palace all the signs of the exhibitors will be uniform. A beautiful fountain will greet the visitor as he enters the garden. More than 200 tons of steel and 1,000,000 feet of lumber are to be used in reconstructing the garden interior. Two monster freight elevators will again be installed to hoist the cars to the galleries. When the show is on these will escape the notice of the visitors by an ingenious idea which will conceal them behind lattice work.

DECORATION SCHEME FOR MADISON SQUARE GARDEN

Paris Salon Now On

French Show Opens With 565 Exhibitors in Grand Palais—America Represented by Twelve Makes of Cars—France Has 200

Special Cablegram from W. F. Bradley

PARIS, Dec. 9.—The doors of the Grand Palais were thrown open to the public at 9 o'clock Saturday morning, admitting the public to the greatest and finest motor show France ever put on, the annual salon. There are 565 exhibitors in all and in the motor car section more than 200 different makes of French cars are displayed. There are thirty-four English makes, twelve American, nine German, eight Italian, and four Swiss. The exhibition covers 200,000 square feet of floor space. A lapse of 2 years has stimulated enthusiasm and an annual show is now assured.

Paris sprung a surprise on Olympia, the motors being all long-stroke. Not counting the Americans, there are 321 four-cylinder; twenty-six sixes; eleven two, and fifteen one two-cylinders listed. The smallest bore is 1.96 by 3.93 inches; the longest stroke 4.33 by 7.87. The range of motors is as follows: Seven motors, 2.36-inch bore; forty, 2.55; thirty-one, 2.75; sixty-two, 2.95; seventy-two, 3.14; eighteen, 3.34; fifty, 3.54; seven, 3.70; thirty-eight, 3.93, and thirty-seven between 3.93 and 5.51-inch bore; thirty-three motors have 2 to 1 stroke-bore ratio; about 50 per cent has 1½ to 1 stroke-bore; the balance are scattered, but none square. Besides the Knight, the show presents six types of sleeve and slide valve motors. The representative makers generally do not look with favor on any but Knight motors. The small poppet-valve motors are well made, economical with fuel and silent acting. The war scare puts a damper on the purchasing.

In comparison, the Paris salon is smaller than the Olympia show, which had more than 700 exhibitors, of which 353 were in the car section alone. Olympia also set up an attendance record that is going to be hard to beat, the returns from the English affair showing 255,112 for the session as against 226,095 in 1911 and 218,908 in 1910.

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erty, which is now owned by the Lyons-Atlas company, for their money.

The receiver has about $84,000, of which $20,550.92 will be used in paying the receiver and his attorneys. The balance, $63,459.89, will go to the merchandise creditors. The Lyons-Atlas Co., in keeping with the terms under which it acquired the property, has paid $31,500 interest due on a bond issue of $1,050,000, $6,500 judgments against the Atlas company, paid a debt of $105,000 secured by a bond issue and has paid debts secured by pledges of Atlas accounts amounting to $48,187.04.

RECEIVER FOR LION NAMED

Detroit, Mich., Dec. 7—A voluntary petition in bankruptcy was filed in the United States district court here on December 6 by the Lion Motor Car Co., Adrian, Mich., whose plant was destroyed by fire some time ago. C. L. Robertson, of Adrian, was named receiver by L. E. Joslyn, referee in bankruptcy, in the absence of Judge Tuttle. The concern's liabilities are given as $108,894.05 and the assets as $105,546.94, of which $86,727.91 is given as merchandise.

GOODYEAR'S ANNUAL REPORT

New York, Dec. 11—Net income of the Goodyear Tire and Rubber Co. for the year ending October 31, 1912, was $3,001,294. Other profits, chiefly on rubber contracts, amounted to $217,593, and the unappropriated surplus from previous operation is $1,856,888. The year proved to be by far the greatest in the history of the company and manufacturing operations were extended to such an extent that it was found to be advisable to increase the capitalization of the corporation. Hitherto the company has had a capitalization of $6,000,000, but during the past year this has been expanded to $15,000,000. The new stock consists of $4,000,000 of 7 per cent cumulative preferred and $5,000,000 common.

During the year dividends of $2,289,100 in common stock have been distributed and $139,604 has been paid to preferred shareholders.

The balance sheet shows assets of $13,818,214. The plant is listed at $3,855,569; actual cash on hand or deposit, $1,268,539; inventories, $4,398,384.

Meet and Talk Roads at Cincinnati

Delegates to Congress Stirred to Enthusiasm Over Outlook for Next Year—More Than $1,000,000 a Day Now Being Spent on American Highways—Comprehensive Display of Machinery Made at Convention

CINCINNATI, O., Dec. 11—The ninth annual convention of the American Road Builders' Association and the third American road congress came to a close here Friday afternoon.

There were no prominent motor car manufacturers to take part in the events, but much transpired that is of importance to the motor car maker and user as well. They undoubtedly will reap the best benefit. Many of the next legislatures will have before them bills to appropriate a world of money to improve the highways. James Marker, state highway commissioner of Ohio, will recommend a sweeping good roads program for next year, which will include a request that the legislature name $1,760,000, to be distributed $20,000 to each county in the state. The program provides that each county appropriate an equal amount, to be added to the state's gift. Assuming that his request will be carried out, he predicts an expenditure in road construction next year of not less than $3,500,000, and possibly $4,000,000, in the Buckeye boundaries.

The enormity of the good roads movement can be realized when it is considered that $1,000,000 is spent in this country every day for improvements. This fact was brought out by Secretary E. L. Powers, who believes that while we are at present far behind Europe in the matter of good roads, our country will soon forge to the front.

There were 150 exhibits on the main floor of Music hall. Each state had some sort of a display, while there were special attractions produced by contractors and others. The exhibit of the state of Ohio took in 400 square feet. The Ohio State University, the University of Cincinnati, the city of Cincinnati and the United States office of public roads had special displays, interesting to the 1,000 or more delegates.

The convention was formally opened Monday morning. Nelson P. Lewis, of New York, chief engineer of the board of estimate and apportionment of that city, made the opening address. Congressman-elect Stanley Bowdle made the address of welcome in behalf of the state of Ohio. Mayor Hunt spoke for Cincinnati. Thomas Pogue, prosecuting attorney, spoke for the county, while Walter Draper extended a welcome on behalf of the chamber of commerce.

In his address President Lewis briefly confined himself to a study of road building from the standpoint of the engineer, the contractor and the civil administrator of highways. He concluded with:

"We are convinced that there is no one thing which will more effectually promote the comfort, happiness and prosperity of the American people, provided the work is intelligently planned, well done and honestly financed. Our aim is to do what we can to improve the character of the work to be done, and to encourage a wise use of the funds provided for the purpose."

William H. Connell, chief of the bureau of highways and street cleaning of Philadelphia, followed Mr. Lewis' address with three papers on "The Organization of a Highway Department." Delegates Spaulding of Wyoming and C. Gordon Reel, chairman of the New York highway commission, talked on "Help from Uncle Sam." An ocean-to-ocean highway is the dream of the far westerners, declared Mr. Spaulding.

"Graft and corruption, politics and the work of a certain class of men in putting into legislation authorized construction provisions which designate patented pavements and specific brands of material, to the exclusion of other materials equally as good, some sometimes better—these are some of the things the road contractors of America have been contending with for many years," embodied the substance of the address made by Hugh Murphy, public works contractor of Omaha, Neb., who spoke on "The Contractors' Point of View."

Among the foreign delegates was M. de Gullegny, commissioner of roads of France, who has been deputized by his government to make a study of public highways in this country. Samuel Hill, of Seattle, Wash., a relative of James J. Hill, was one of the prominent delegates from the Northwest. General Jacob S. Coxey, who sprang into national prominence in 1894 as the commander of the hobo army of idle men which marched to Washington as a "human petition to congress," was an attendant, and was greatly interested in the congress.

ARIZONA READY TO WORK

Phoenix, Ariz., Dec. 7—Soon after January 1 the work of building Arizona's state highway system will again be in full sway. Work has been practically suspended since last February, when the state administration took the reins of government, for the treasury was empty then. Taxes will be coming in by the first of the year and work can proceed without interruption.

Two surveying parties are now in the field, one in Graham county and the other in Cochise. They are laying out sections of the state highway system. Portions of the system that were built while Arizona was still a territory are to be connected.

There is some dissatisfaction with the present road taxation law. This law levies an assessment of 25 cents on each $100 valuation of property, but provides that 75 per cent of each county's contribution must be expended within its own borders, under the direction of its board of supervisors. The remaining 25 per cent is expended wherever the state engineer and board of control think it will do the most good. It is argued that the money is thus spread over too wide an area, that it will take too long to build a complete, connected system.

A strong sentiment in favor of issuing bonds to build the projected highway system exists in the state. At a recent meeting the associated boards of supervisors of Arizona recommended a bond issue of $10,000,000. It is probable the legislature, at a special session early next year, will take action to submit the proposition to the people.

During 1912 some excellent road work has been done by the state's convicts. Governor George Hunt's honor system of setting convicts to work without guards is proving quite successful. The convicts are building a fine concrete bridge across Salt river, 8 miles east of Phoenix, which is almost completed. As soon as it is finished the gang will be taken down the Gila river to a point near Yuma, where another bridge is to be built. Convicts are also building a road through the Pinal mountains, from Ray to Globe, and another westward from Florence toward Phoenix. These roads are costing the state about one-fourth what they would cost if built by contract labor.

BOOSTING FOR MIDLAND TRAIL

Denver, Colo., Dec. 7—All motor interests in Denver and several other Colorado cities are now centering in a vigorous campaign just launched by the Denver Motor Club and the Denver chamber of commerce to secure the establishment of the proposed Midland trail as the first official motor highway from coast to coast. Good roads promoters of Colorado and Utah have organized the Colorado-Utah Midland Trail Association, with headquarters at Grand Junction, Colo., and branches of the new organization are being formed in all the interested cities in both states.

The movement was given an impetus in this city a few evenings ago at a mass meeting where addresses were given by

Governor-elect Ammons and good roads enthusiasts from many parts of the state. All the other commercial, good roads and civic organizations of the city have been asked to appoint committees to co-operate in the fight to bring the first official transcontinental highway through Denver, Grand Junction and Salt Lake City. Other towns joining the movement are Golden, Idaho Springs, Sulphur Springs, Kremmling, Wolcott, Glenwood Springs, Rifle and Mack, Colo., and Green River, Price and Provo, Utah.

The proposed new route extends from New York city to San Francisco, via Philadelphia, Pittsburgh, Columbus, Indianapolis, St. Louis, Kansas City, Topeka, Denver and Salt Lake City. It is reported to be some 200 miles shorter than any of the other three coast-to-coast routes marked out by Westgard during the last few years.

The Denver Motor Club and the Denver chamber of commerce are elated over a report just received from Carl G. Fisher of the Ocean-to-Ocean Highway Association, that the exploration and pleasure tour to be made from Indianapolis, Ind., to the Pacific coast next summer will be scheduled for a stop in Denver. The party will leave Indianapolis next July 4, and will include 100 or more cars and probably a number of army trucks.

This inspection tour, which will be conducted by the Indiana Automobile Manufacturers' Association, is looked forward to by local motorists and good roads promoters as destined to bring Colorado more and more before the public as a motor tourist state.

The Denver-Chicago sociability and advertising tour made last summer by ten Colorado cars was the first event to call the attention of the motoring public of other states very prominently to Colorado. The trip made through Colorado's mountains a short time ago by John P. Dods, of the Automobile Blue Book Publishing Co., created a great deal of additional interest, and another valuable contribution has been made by the recent laying out of the Midland trail through Denver by A. L. Westgard, of the American Automobile Association.

The series of articles now running in Motor Age, entitled "One Thousand Miles Through Colorado," written by J. P. Dods, is calling forth a great deal of interest and appreciation in this section.

All these enterprises are accomplishing a great deal toward arousing a widespread and intelligent appreciation of the value of good roads to every community, whether urban or rural.

TEACHES HOOSIERS ROAD LESSON

South Bend, Ind., Dec. 10—Edward Hines, of Detroit, road commissioner of Wayne county, addressed a meeting of business men, manufacturers, professional men and farmers interested in the making of good roads, Saturday night. The meeting, which was arranged by the chamber of commerce, was preceded by a dinner for Mr. Hines and Paul D. Sargent, an assistant director of good roads for the United States government, arranged by the directors of the chamber.

Mr. Hines' talk was illustrated by motion pictures, showing the construction of the concrete type of roads which he has developed. The pictures showed the roads radiating from Detroit a few years ago in almost impassable condition; mud hub deep was no exception. The concrete roads which have been constructed to the extent of 125 miles on the various roads were shown in construction and completion.

The farmers are enabled to make their trips to market in a fourth of the time formerly required, Mr. Hines declared, and in addition have the advantage of coal and ice delivery service and daily newspaper delivery by carriers on roller skates as in the city. The cost of road, according to Mr. Hines, is $15 per square yard. Considering the durability and the excellent surface, with scarcely any dust, he declared the concrete road is most economical in the long run.

The first road in Wayne county of this type was built 4 years ago and there is not a rut or hole in the entire surface today, said Mr. Hines, who also declared he had ascertained this by a careful inspection trip. The construction and maintenance of the Wayne county roads under the Michigan law, which is largely the work of Mr. Hines and his associates, is entirely in the hands of three road commissioners who conduct the work winter and summer, on a strictly business basis. About 1,200 men are employed during the building season and in the winter many are at work making the concrete tiles which are used for drainage.

ANOTHER GOOD ROADS BODY

Davenport, Iowa, Dec. 7—Permanent organization of the Tri-City Ocean-to-Ocean Official Highway Association was effected at a meeting of good roads boosters of Davenport, Rock Island and Moline at the Rock Island club last week. This association will work for the improvement of roads in Scott county, Iowa, and Rock Island county, Illinois, and in addition, will endeavor to put the tri-cities on the line of the official Ocean-to-Ocean highway, which will carry tourists to the Panama exposition at San Francisco in 1915. Among the officers elected were: President, George W. Ross, East Moline, and secretary-treasurer, A. E. Nissen, Davenport.

Canadians Blaze a Trail from the Atlantic to the Pacific

Motor Journey from Coast to Coast Takes Forty-Nine Days

VANCOUVER, B. C., Dec. 10—Out of the haze of dreams, out of the realm of visions, the Canadian highway emerges, proved feasible on the first attempt at a transcontinental journey.

The tour officially started at Halifax and ended at Victoria on October 18, on the return from the west coast of Vancouver island, when a banquet was given to the pioneers by the president of the Automobile Association, A. E. Todd. The actual tour from coast to coast occupied 49 days' elapsed time. The actual running time was 41 days and the mileage was 3,900 miles, which gives an average of 95.13 miles per day.

Road conditions were bad owing to the immense rainfall in every part of the country. Many parts of the country, especially Manitoba, were turned into swamps and quagmires; this reduced the daily averge considerably.

In addition to the 3,900 miles, 700 miles were covered under other than the car's own power, owing to the absence of trail or road. This applies particularly to New Ontario. As far as North Bay no shipping had to be undertaken, although this was the first car that ever had come through all the way from Halifax to that point.

At first it was not difficult to keep up an average of 120 miles a day, but from the prairie provinces on this was reduced to as low as 60 miles. The highest daily run was made in Alberta, 184 miles, between Maple Creek and Lethbridge, the lowest in Manitoba, 114 miles, from Winnipeg to Headingly, owing to the wretched state of the gumbo roads. The car was running on average of 10 miles to the gallon; sometimes as much as 15 miles were made to the gallon, but in some parts of British Columbia 5 miles to the gallon was good going. The number of broken links in the road through British Columbia necessitated running on the ties in some places and taking a steamer on Kootenay lake on another occasion. The cost of crossing from Halifax to Vancouver averaged about $2.50 a day per person. The expenses of the car were about $5 inclusive of repairs.

The gumbo roads of Manitoba were in such bad condition that the drivers went on strike in Winnipeg, causing a 3 days' delay. Owing to the absence of roads many detours had to be made, amounting to 600 miles altogether, of which 300 were in Ontario and 300 in British Columbia.

Scarcely any macadam roads were found on the journey. The majority were earth and the rest gravel. The best roads were in British Columbia and in Ontario, the worst in Manitoba. The earth roads of the maritime provinces and Alberta were of about equal merit.

United Motors Ready to Move to Detroit

NEW YORK, Dec. 11—Special telegram—Final preparations are being made for the removal of the United Motors headquarters from New York to Detroit. The date for the actual change is still unfixed, but it is generally believed that it will be accomplished very shortly after the judicial sale has been made and reorganization finished.

During the past week a series of meetings has been held at headquarters behind closed doors and the announcement has been made that the few remaining office employes of the company will resign within a short time. The removal of the company to Detroit places its administrative departments in close proximity to its manufacturing plants and foreshadows renewed manufacturing activity at the quiescent factories of the company in the Detroit zone.

The affairs of the United States Motor Co. await the judicial sale that has been decreed for January 8. In the meantime manufacturing activities are at a low ebb. Save for such industrial work as is necessary to maintain the supply of parts for the repair of existing cars, all the plants of the company are shut down except for the completion of the manufacturing schedules of 1912 and the continuance of the manufacturing schedules of the Maxwell-Briscoe Motor Co. for 1913 and its experimental work for 1914.

The Brush and Sampson plants are idle except for the production of spare parts; the Columbia is finishing the last of its regular schedule; Stoddard-Dayton has finished its schedule. The three Maxwell plants, chief of which is at Tarrytown, N. Y., have about completed schedule. The Newcastle plant is inactive for the time being and the Providence plant is quiescent. The Thomas plant is completely shut down except the repair department.

Under order of court the issuance of $1,500,000 of receivers' certificates was authorized to commence the Maxwell manufacturing schedule for 1913 and much work has been done toward this end. So far the money used for the Maxwell program has come from other sources than the sale of the certificates.

Attorneys for the creditors state that upwards of 95 per cent of the total claims against the company have been filed, indicating an almost unanimous opinion in the minds of the creditors as to the feasibility of the reorganization plan.

The second call for 10 per cent of the assessment levied against the stock has been made, but details as to the exact amount of stock deposited are lacking. It is said that it totals more than a majority. No apprehension is felt among the various interested elements in New York with reference to the court action in bankruptcy in New Jersey. It is pointed out that the

Transfer to be Made When Judicial Sale Is Consummated

New York court has possession of the assets and that the indicated program of sale of the big holding corporation will be carried out.

At the meeting of the sales and district managers of the company, those who represented districts in which the branch houses have been liquidated resigned automatically and the remainder considered the future in executive session.

ALFRED REEVES MAKES CHANGE

New York, Dec. 10—Alfred Reeves, vice-president and sales manager of the United States Motor Co., and A. R. Gormully, general purchasing agent of the same corporation, have severed their connections with that company to engage in other work. Mr. Reeves has been elected vice-president and general manager of the Hartford Suspension Co., manufacturer of shock absorbers, electric starters and lighters and specialties.

Mr. Gormully has been elected treasurer of the Steinbock Engineering Co., which has been in course of development for about a year. It is announced that he probably will assume some more intimate connection with the industry in the near future.

NEW SWINEHART GENERAL MANAGER

Akron, O., Dec. 10—Clifford B. Myers has been appointed general manager of the Swinehart Tire and Rubber Co. to take the place of W. W. Wuchter, president of the company, who has acted as general manager. Mr. Myers has been identified with the Diamond Rubber Co., serving in the capacity as manager, for Ohio. It was announced today that the Swinehart company has plans under way for a material enlargement of the Akron plant. The present factory is in a business district in the city, and as it is practically impossible to buy more land there, it is probable that a new factory will be built in the suburbs.

MORE CHICAGO EXHIBITORS

Chicago, Dec. 10—More motor truck and wagon makers have contracted for space at the Chicago show during the past week. This brings the list of complete vehicle exhibitors up to sixty-nine—one more than in the New York show.

As all of the ground floor space in the Coliseum, annex and First Regiment armory has been allotted, it has been found necessary to set aside a large section of the second floor of the annex for the display of the lighter types of motor wagons. This embraces all the space on the south half of the center aisle formerly devoted to motor cycles.

Among this year's exhibitors are sixteen companies that never have shown their product at Chicago. All but four of these are wholly new makers whose machines are just coming into the market for the first time. Eighteen of the Chicago exhibitors have made no arrangements to display in New York this winter. Most of these are mid-western makers, located principally in Chicago, and in other Illinois, Wisconsin, Michigan, Indiana and Ohio cities.

The week's additions to the list are as follows: Harder Fireproof Storage Warehouse Co., Chicago; Kentucky Wagon Mfg Co., Louisville, Ky.; H. J. Koehler Sporting Goods Co., New York; Lansden Co. Newark, N. J.; Mais Motor Truck Co. Indianapolis, Ind.; Mercury Mfg. Co., Chicago; Mogul Motor Truck Co., Chicago. Stewart Motor Corporation, Buffalo, N. Y.; Ware Motor Vehicle Co., St. Paul, Minn.

The M. & P. Electric Car Co. and Transit Motor Truck Co. have dropped out and given up their spaces.

TARIFF REVISION HEARINGS SET

Washington, D. C., Dec. 10—Hearings on the revision of the tariff law will begin January 6 and continue thereafter every Monday, Wednesday and Friday until the various schedules are completed, according to a decision made by the Democratic members of the ways and means committee. One day will be devoted to each schedule, though if necessary in any case not exceeding 2 days will be allowed by the committee.

There are fourteen schedules to be considered. The schedules will be considered in their regular sequence in the present tariff law. The first hearing, on January 6, will be on schedule A, fixing the duties on chemicals, oils, etc. The metal schedule is expected to be reached about January 13, at which time it is expected the motor car and allied industries will be on hand to air their views.

OHIO'S PLANS FOR 1913

Findlay, O., Dec. 9—State Highway Commissioner James M. Marker has made his plans known in reference to road building in Ohio for 1913. He will request that the legislature appropriate $1,700,000, which would give every one of the eighty eight counties in the state $20,000 each. This program will be with the understanding that each county votes a like amount for good roads. Mr. Marker says he will ask the legislature to provide for a ½ mill levy on good roads construction during 1914. Under the present system of state aid each county receives $5,000 each year.

S. A. E. Announces Its Winter Program

NEW YORK, Dec. 10—Details of the program to be followed at the annual meeting of the Society of Automobile Engineers are contained in the current issue of the bulletin published by that organization.

The sessions will be held at the new Hotel McAlpin and will commence January 16 at 9:30 o'clock in the morning with a business and professional meeting. There will be a professional session at 2 in the afternoon and the commercial vehicle will be the subject of discussion and consideration at the evening meeting.

Friday, January 15, will have professional sessions at 9:30 a. m. and 2 p. m. and in the evening the annual banquet will be held at the McAlpin. Saturday morning's professional session will close the convention.

Prior to the opening meeting the standards committee will assemble on Wednesday at the headquarters of the organization to receive the presentation of the reports of subdivisions that have met with the approval of the council. Among the papers and reports scheduled are the following:

Reports: Broaches, S. W. Spicer; ball and roller bearings, David Fergusson; frames, J. G. Perrin; miscellaneous, A. L. Riker; sheet metals, T. V. Buckwalter; motor testing, John O. Heinze. Nomenclature: springs, Harold L. Pope; truck standards, William P. Kennedy; wheel dimensions and fastenings for tires, William P. Kennedy, and aluminum and copper alloys, William H. Barr. All of the above are formal reports of divisions of the standards committee and will be presented by the various chairmen as noted.

Among the formal addresses scheduled are the following: "Effect of Relation of Bore to Stroke in Automobile Engines," John Wilkinson; "Stability of Automobile Propeller-Shafts," J. M. Thomas; "Methods of Brake Capacity Determination," S. I. Fekete; "Leaf Springs," L. J. Lane, and "Standardization of Drawings," George W. Dunham. Numerous other optional papers have been listed.

Many Reports to Be Received and Interesting Papers Discussed

"The work of the office of public roads of this department," says Secretary Wilson, "fortunately has kept pace with the widespread demand for information and assistance in road matters. There have been built during the present fiscal year thirty-two object-lesson roads under the direction of the engineers from this office. Eight sections of experimental roadway were constructed at Chevy Chase, Md. These sections were built for the purpose of determining the relative merits of different forms of bituminous material used as binders and dust preventives on macadam roads. A careful traffic census has been taken each thirteenth day since the completion of the work. It is planned to keep accurate records of the cost of maintenance of the various sections and properly to relate such costs to the traffic sustained by the road."

UNCLE SAM NOTES PROGRESS

Washington, D. C., Dec. 7—In his annual report to President Taft the secretary of agriculture calls attention to the fact that there probably never was a time in the history of the United States when the question of improved roads was under more serious consideration. The process of centralizing the control of highways has gone steadily on and each year sees an added number of states that have established state highway departments. There remain many perplexing questions in highway technique and in the plan of administration and finance for public highways.

MEETINGS DURING NEW YORK SHOW

New York, Dec. 9—Detailed schedule of the various meetings to be held during the coming show season by the Motor and Accessory Manufacturers has been announced as follows:

Tuesday, January 14, at 10 o'clock a. m.—Meeting of the executive committee at headquarters.
Tuesday, January 14, at 3 o'clock p. m.—Meeting of the board of directors at headquarters.
Wednesday, January 15, 5:30 o'clock p. m.—Tenth annual meeting at Waldorf-Astoria.
Wednesday, January 15, 8 o'clock p. m.—Fifth annual banquet at Waldorf-Astoria.
Thursday, January 16, 2:30 o'clock p. m.—Board of directors at headquarters.

TETZLAFF PROMOTING ROAD RACE

Santa Barbara, Cal., Dec. 7—Teddy Tetzlaff, the racing driver, and Bert Smith, motor editor of a Los Angeles paper, are at present promoting a road race to be run July 4, from Los Angeles to San Francisco. The two are trying to get the coast and valley routes to bid against each other.

Santa Barbara undoubtedly will help the valley. In other words, Santa Barbara does not want the road race to come this way. The matter was informally discussed at the meeting of the chamber of commerce and no voice was raised in the interest of the race because of the damage to the roads.

The plan of the promoters is to have the two sections of the state bid against each other. While here Tetzlaff said Bakersfield would offer $5,000 to have the race come that way. Santa Barbara folk hope Bakersfield wins out. Rather than bid for the race they would give to insure the race going somewhere else.

The coast route would be the most advantageous. The Rincon sea-level road has shortened the distance 9 miles and provided an easier grade. But it is feared that half a hundred speeding cars would do much damage to the causeways and new paving, and at the same time set an example for others who might later wish to reduce the record. Santa Barbara has had some experience with record-breakers and is heartily tired of them.

RECEIVER FOR FLANDERS MFG. CO.

Detroit, Mich., Dec. 7—Following a meeting of the board of directors of the Flanders Mfg. Co. on December 4, at which plans for the continuing of the business were submitted by the creditors' committee, application was made on behalf of the Wagner Electric Mfg. Co., St. Louis, Mo., by S. T. Douglass, an attorney, of Detroit, before Judge Tuttle in the federal court in Bay City, Mich., on December 5, to have a receiver appointed for the Flanders concern. The Detroit Trust Co. was appointed, the bond being fixed at $50,000.

According to a statement of the Flanders company's affairs which appeared in these columns, the concern's assets are greatly in excess of its liabilities, and its present financial distress is merely from the lack of ready capital. It is generally understood that the Pontiac plant is a money-making one, and that the straitened monetary condition is due to several other holdings. It is proposed to continue business in the event that the contemplated refinancing and production plans are agreeable to the receiver.

QUAKERS HOLD AN ELECTION

Philadelphia, Pa., Dec. 5—At the annual meeting and election of officers of the Quaker City Motor Club in the Hotel Walton on Tuesday night, the following were chosen to serve the ensuing year: President, Paul B. Huyette; first vice-president, C. Douglass Bartlett; second vice-president, I. T. Shoemaker; treasurer, Ralph L. Murray; secretary, A. E. Adams; board of governors, L. D. Berger, P. D. Folwell, Dr. L. L. Gaus, G. Hilton Gantert, George M. Graham, Frank Hardart, E. T. James and B. H. Kirkbride. With the exception of Dr. L. L. Gaus and B. H. Kirkbride, directors, and A. E. Adams, secretary, the personnel of the board is the same as last year.

TO MAKE TAIL-LAMP LIGHTER

Indianapolis, Ind., Dec. 10—The Auto Lamp and Number Co. has been organized and incorporated here with an authorized capitalization of $3,000 to manufacture a combination illuminated registration number and tail light. Those interested in the company are Ransom Griffin, A. P. Conklin, R. H. Bruce, William F. Johnson and George L. Maas, all of whom are engaged in the lumber business.

1000 Miles through Colorado

Through the Arkansas Valley

THE ARKANSAS VALLEY

TO THOSE unfamiliar with the Arkansas valley it is almost impossible to describe the wonderful charm of this beautiful valley with its almost ideal climate, particularly below Buena Vista. The upper Arkansas has its head waters above Leadville just below Tennessee pass at an altitude of nearly 10,000 feet. It flows almost directly southward between the Continental divide on the west and the Park range on the east through Buena Vista to Salida, where it turns sharply eastward through the Royal gorge to Canon City across the plains of southeastern Colorado. Between Leadville and Buena Vista the valley has many narrow places where the highway is literally cut out of the cliff. Between Buena Vista, Salida and Cotopaxi the valley is quite broad and flat with some of the most fertile and productive farms in the state. When the new highway between Cotopaxi and Canon City is completed the tourist will be able to follow very closely the course of the river practically all the way from its source to Canon City and probably nowhere will one be able to find such a variety of scenery

ON THE WAY TO BLACK MOUNTAIN ON CENTRAL HIGHWAY

Lenoir to Blowing Rock and from there to Boone. Good hotels are at Boone. Garage service and gasoline may be procured here also. The Vonalo pike extends from Blowing Rock to Linville. Good hotels, gas and garage service may be had at Linville. These are parts and tributaries of the crest of the Blue Ridge highway which have been completed.

As to a few points of general information for the motorist in North Carolina: The fall and summer should be chosen for motoring in the Piedmont and western section of the state; the late fall and winter should be chosen as the season for motoring in the eastern section. It will be borne in mind the state has no large cities, but is full of smaller growing cities and towns. At practically all of these gasoline may be had. Garage service can be had at most of them. Garage charges are reasonable, generally 50 cents a night. Hotels charge an average of $2.50 per day, American plan, or $1 to $3, European.

Especially pleasant for the late fall and winter season now approaching is the motoring in and about Pinehurst. There the roads are splendid, the days full of sunshine. Japonicas bloom in the open air in February in that country. The great strawberry fields and lettuce fields are green all the year round. Boatloads of fish come in, as many as 100,000 pounds in one haul. These are shipped inland.

Eastern Section's Drawing Cards

The colonies of emigrants in the eastern section near Wilmington may be seen with interest. Here successful colonization has been achieved on small farms of 10 to 20 acres. The golf links at Pinehurst furnish an attraction to passing winter motorists. It is a favorite liking of John D. Rockefeller to frequent these links each winter.

North Carolina has caught the good roads fever and it has caught for a purpose. That purpose is to turn the tide of some of the motorists who frequent European capitals and traverse European roads and teach them by ocular proofs and undeniable facts that it is best to "See America first, a cry all should take up.

MORAVIAN CEMETERY IN OLD SALEM ON NATIONAL HIGHWAY

ARIZONIANS GOING TOURING

E. R. Pirtle, of Douglas, Ariz., state agent for the Cadillac, is arranging a tour over a route that is not surpassed in the United States for scenic magnificence. The route is from El Paso to the Grand canyon and return, and the tour will occupy 17 days.

All Cadillac owners and drivers will be invited to participate in the tour, which is to be held during February. Mr. Pirtle has just made a trip over the route and he declares that the roads are excellent most of the way. His car did less than 300 yards of low gear work. Moreover, he found ample accommodations along the way for a large party. Arrangements are now being made for special rates at hotels and garages. A trouble car will be taken along with plenty of spare parts, tires, oil and gasoline. A physician also will go to Globe by way of the famous Roosevelt dam. The Roosevelt road is claimed to be the most beautiful and scenic in the United States.

The following day the Cadillac people will travel 60 miles through the heart of the Gila Indian reservation, where they will see the redskins living in wikiups the same as they lived 100 years ago. A stop will be allowed at San Carlos for the purpose of buying Indian baskets and trinkets. At Fort Thomas a drive through the beautiful Gila Valley, one of the garden spots of the southwest, will commence. The night will be spent at Safford.

From there the route continued through Solomonsville down through Ash Spring canyon. At Sheldon the Gila river will be crossed and a few hours more will take the party to Lordsburg, N. M.

On the return to Phoenix the petrified forest and ice caves will be visited. At Phoenix the party will leave the route by be in the party.

While the itinerary has not been arranged entirely, no day's journey will be over 125 miles, and this only where the roads are very good. No more than 7 or 8 hours a day will be spent on the road.

In all probability the first night out of El Paso will be spent at Deming, N. M. The second day's run will be made through Lordsburg and Granite Gap to Douglas, Ariz.; the third day through Bisbee and Port Huachuca to Tucson. From Tucson to Phoenix will be 1 day's run, with a stop of several hours to inspect the state prison at Florence. One day's rest will be had in Phoenix and the next day the party will go to Prescott; the next to Flagstaff; the next to the Grand canyon.

worm wheel. The axle housing is a standard type of Timken stamping with the differential expansion placed horizontally instead of vertically, as in the bevel-driven axle. The worm shaft is carried fore and aft on special non-adjustable Timken rollers, their end-thrust merits eliminating special end-thrust bearings. The unit made up of the worm and worm-wheel with differential is mounted in a steel casting which is hung in the under side of the axle stamping. There is a 4 to 1 reduction between worm and wheel. The axle is a floating type, and carries standard internal and external brakes.

Lancaster Rear Springs

The Lancaster rear springs, Fig. 7, are inverted semi-elliptics supported in their center to the frame through a trunnion; shackled to the frame at their fronts, and carried underneath the axle at their rear where they are not shackled, but bear upon a roller, thus allowing for free back and forward motion. The merits of this spring are several: First, the entire weight of the spring is supported on the frame, thus taking that amount of unsprung weight off the axle, which is desirable in that the more unsprung axle weight there is the more tire wear. Second, with this spring there is twice the up and down movement for the same opening of the spring as compared with a semi-elliptic. This cuts the periodic time of spring vibration in half, giving a slow period of vibration and easy riding. The spring is 54 inches long and is a simple suspension member, being freed from driving strains by the radius rods.

In the running gear the double-dropped frame gives a low body, the drop being 3 inches at the dash and 7 inches in advance of the axle. Tires are 36 by 4.5 inches all around.

BAY STATE MOTORISTS ALARMED

Boston, Mass., Dec. 7—Further evidence that there is a possibility that the speed law of Massachusetts may be amended, or an attempt made to do so, when the next legislature convenes is found in the communication sent by the Massachusetts highway commission to Francis Huturbis, Jr., counsel for the National Automobile Association on the speed laws, in answer to a query by him. In this letter the latter part of it refers to a fixed speed limit, and the highway commission recently having approved a limit of 25 miles an hour for the Nahant boulevard, the indications point to a change. It took 4 years of fighting, from 1902 to 1906, to get the present law allowing a reasonable and proper rate of speed to get on the statue books and a change now would not be advisable. Here is the letter:

Your letter of November 21, calling attention to the numerous complaints made to the National Automobile Association as to the over-speeding of motor vehicles on the public highways, has been received and presented to the commissioners, and they have directed me to state that, in their opinion, there is just cause for complaint, as the number of cases of over-speeding, improper and reckless driving this year is greatly in excess of that of former years, and that they believe that your association can do a great deal of good by taking the matter up seriously and attempting to see that motor cars are not operated improperly or at excessive rates of speed.

The commission is inclined to think that it might be wise for the legislature to enact a law fixing a maximum speed limit of 25 miles an hour, as this season, especially after the entry of cars from other states which allow high rates of speed, there was a marked increase in the number of cars running at excessive and dangerous rates of speed.

Judging from this it would not be surprising if the highway commission in its annual report to the governor, which is made each year about January 1, suggested that a change be made. This will mean a fight, of course, on the part of the motorists, for other New England states patterning after Massachusetts, would do the same, and 25 miles an hour would be the limit in all New England.

This would lead to the old trap system again in many places and the motorists would be the victims. What the commission may have in mind, judging by its past performances in securing legislation, is to suggest 25 miles an hour, and then after a fight, agree to a law for 30 as a compromise. So this will probably be one of the real fights on the next session, and it will be of much interest to motorists everywhere now that New England is so well traveled each summer.

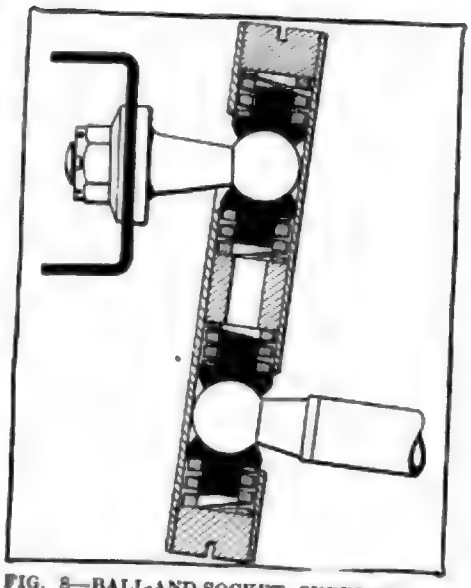


FIG. 8—BALL-AND-SOCKET SUPPORTS OF RADIUS RODS

WANT STATE TO TAKE THE ROAD

The Massachusetts highway commission has been asked to submit an estimate of the cost to put what is known as the North Pike road that runs through the towns of Clinton, West Boylston and Sterling into first class condition. The selectmen of all three towns had a conference recently on the matter following an inspection of the highway which was once in fine condition but which is now dangerous for travel and as the towns would be liable for damages the officials want to prevent suits in future. If the road can be put in shape for a reasonable sum the towns will pay the bill and then request the state highway commission to take it over as a part of the highways under its jurisdiction.

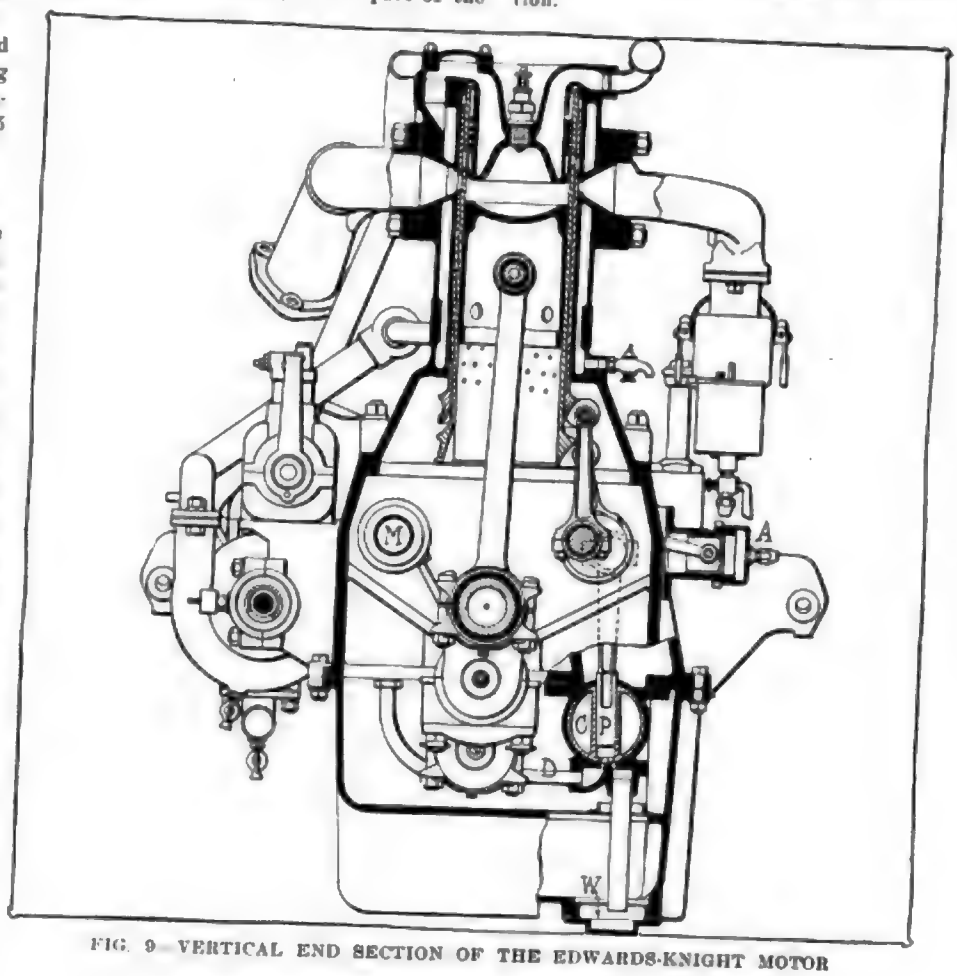


FIG. 9—VERTICAL END SECTION OF THE EDWARDS-KNIGHT MOTOR

The Readers

The Long-Stroke Motor

Correspondent Reviews Discussion by Duryea and Others and Draws Conclusions

BRIDGEPORT, CONN.—Editor Motor Age—The interesting discussion which has been going on in the columns of Motor Age, upon the relative merits of the long and short stroke motor has aroused me to the point where I wish to avail myself of the privilege of its columns to express a few views in the hope that the resultant discussion will clear the matter up.

In the first place, in comparing the long and short-stroke motors, in actual operation as well as from a theoretical standpoint, should not one specify that the motors under comparison besides having the same piston displacement also should have the same percent of compression volume?

It is obviously unfair to compare a short-stroke motor of 24 or 25 percent compression volume with a long-stroke motor of 30 percent compression volume, or vice versa. It is well known that from both theoretical and practical considerations the motor having the higher compression of the two is more powerful and more efficient. The instant of maximum temperature occurs when the gas is at a smaller volume and the surface available for conducting heat to the jacket water is less, consequently the motor converts more heat into mechanical work than the low-compression engine. The volumetric efficiency of the high-compression motor is higher than that of the low-compression motor as the percent clearance is smaller and scavenging more perfect. The propagation of the flame through the charge is more rapid and this results in a higher explosion pressure and temperature. Experimental results show great gains in power and efficiency due to employing high compressions. From the foregoing I think that the two types of motor should have the same percent of compression space to displacement.

Mr. Duryea points out in his letter of November 14 in Motor Age that the ratio of expansion is dependent on the valve timing employed measured in degrees or percent of piston travel and that the earlier the exhaust valve opens the lower is the ratio of expansion of the gas compared to the volume drawn in.

Finally, the comparison between the two motors should be made at the same number of revolutions per minute and not at the same piston speed as is often done. This will no doubt be vigorously opposed but my reason for this suggestion follows.

The motors having the same piston displacement and percent compression, and being similarly timed, will at the same number of revolutions per minute draw in the same volume of air and fuel so that the heat available per stroke is the same in each motor, and any difference in performance will be due to inherent characteristics of the motors.

With the same volume of gas and the same compression the pressure of the explosion and M. E. P. should be the same, neglecting any difference in radiating surface in the two combustion spaces. Then in the case of the short-stroke engine we have a large net pressure on the piston working through a short distance. In the case of the long-stroke engine we have a smaller net pressure working through a longer distance. From a purely thermodynamic standpoint the motors are exactly equivalent, but from a mechanical and structural standpoint there appears to be a difference.

To illustrate, assume two motors of the same type, same piston displacement, compression, valve timing, etc., one 4.5 inches by 4.5 inches and the other 4 inches by 4.5 inches. Assume an explosion pressure in each case of 300 pounds per square inch. The area of the square motor piston is 15.904 square inches and the net pressure on the piston at the moment of explosion is approximately 4,780 pounds; while for the long-stroke motor with a piston area of 12.566 square inches the net pressure on the piston will be 3,770 pounds, a difference of 1,010 pounds.

This permits the use of lighter pistons and connecting rods, shorter bearings, or lower bearing pressure for the same length of bearing. In the latter case the loss due to friction in the main bearings and connecting rod bearings is less for the pressure per unit of area is reduced and the rubbing velocity remains the same as the engines are being compared at the same revolutions per minute. The bearings are the same diameter, as the torque is the same under the assumptions made. The bearing friction losses and connecting rod bearing losses which are dependent on the velocity of the rubbing surfaces and the pressure between them will be less in the long-stroke motor for the above cited reasons.

If the angularity of the connecting rods is made the same by lengthening the rods of the long-stroke motor in proper proportion, the pressure of the piston against the walls of the cylinder is reduced in total—the load on the piston being less and the angularity of the rods being the same—but the rubbing velocity is greater and hence these two factors tend to balance one another, the piston friction losses being the same in the long and short stroke motor. I believe when designers go to either extreme in design the product of these two factors tends to increase and wipe out what is gained elsewhere. For

EDITOR'S NOTE—In this department Motor Age answers free of charge questions regarding motor problems and invites the discussion of pertinent subjects. Correspondence is solicited from subscribers and others. All communications must be properly signed, and should the writer not wish his name to appear he may adopt a nom de plume.

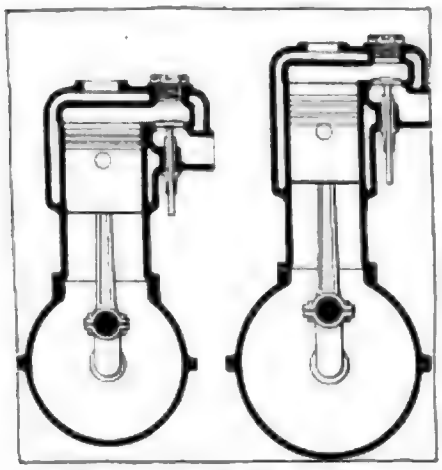


FIG. 2—DIFFERENCES IN LONG-STROKE AND SHORT-STROKE MOTORS OF SAME DISPLACEMENT

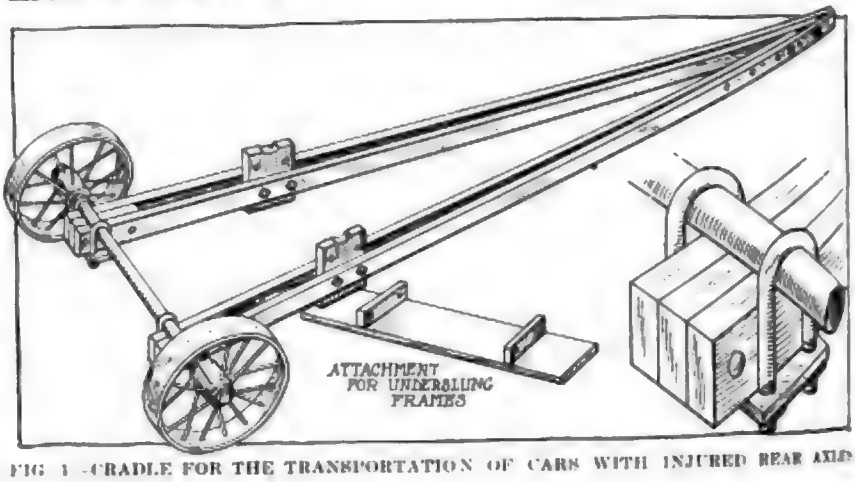


FIG. 1—CRADLE FOR THE TRANSPORTATION OF CARS WITH INJURED REAR AXLES

Clearing House

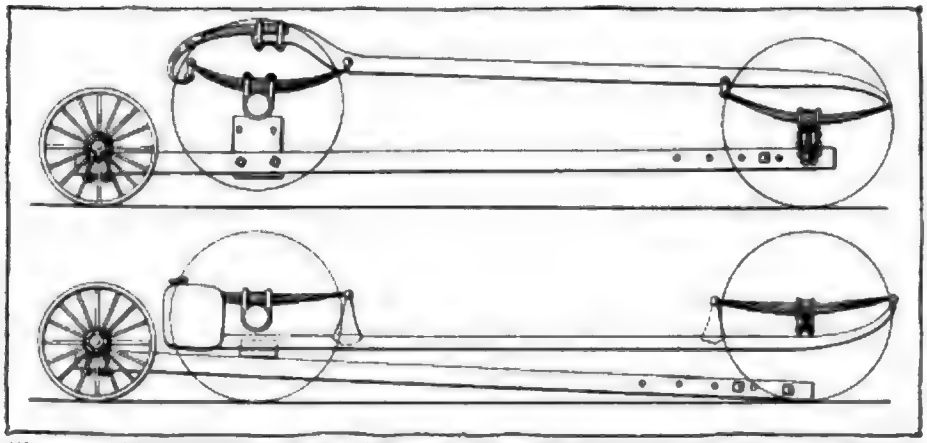


FIG. 3—APPLICATION OF APPLIANCE FOR CARS WHICH HAVE MET WITH ACCIDENTS

periments appear to bear this out as there is a slight improvement in the motors as the ratio of bore to stroke is increased to 1:1.2 or 1:1.3 and beyond that no advantage is realized.

On the other side of the Atlantic engineers have demonstrated the advantages of the long-stroke motor more thoroughly than has been done here. They have been able to concentrate enormous power in comparatively light motors by running at very high piston speeds, without sacrificing consistency of running smoothness or flexibility; in fact they have gained considerably in all these features. With very large square motors it is a problem to keep the face of the piston cool and the record of seized pistons in races is against the square motor. The problem confronting the designer is: given a motor of certain required power and piston displacement, compression, etc., shall it be a square motor or a medium long stroke.
—Delmar G. Roos.

Figs. 2 and 7 illustrate the points referred to in Mr. Roos' discussion.

AIR STARTER FOR STEVENS-DURYEA

Madison, Wis.—Editor Motor Age—I drive a 1912 model A A Stevens-Duryea and am anxious to know the possibilities of installing a compressed air starting system. I see no reason why the air distributor could not be mounted where the present Kellogg pump stands, but am at a loss to know where to install the pressure pump. Would the present pump, which is of four-cylinder design, do? The car is equipped with a gas starter. Could not the leads from the air distributor enter the cylinders through the openings of the petcocks now employed.

dresses of manufacturers marketing start-

2—Please give me the names and ading systems of this type that you could recommend.

3—I would also like to know just how near to stock was the Stutz machine used in the Milwaukee races. It seems to me its performance was wonderful, considering its horsepower, with that of the winner. Was it geared higher than stock, any special transmission, motor, etc.?—Byron S. Potter.

1—The Kellogg pump will serve very well for this purpose. The distributor may be mounted on the same shaft that drives the pump. The acetyline piping would not serve as air leads. In starting on acetyline, the pressure is low and the volume of gas to be transmitted is small. On the other hand in the compressed air system the volume of air is considerable and a pressure of from 30 to 90 pounds is usually employed. The same applies to the engine valves used by the gas system.

2—The following manufacturers manufacture pneumatic engine starters:

Kellogg Manufacturing Co., 1 Circle St., Rochester, N. Y.

Crescent Air System Co., Ford Bldg., Detroit.

Lipman Mfg. Co., 211 Pleasant St., Beloit, Wis.

Janny-Steinmetz Co., Philadelphia, Pa.

Lombard Mfg. Co., 30 S. Water St., Rochester, N. Y.

Roth-Murphy Co., Lemke Bldg., Indianapolis.

Start-Lite Co., 1502 Michigan Ave., Chicago.

Wilson Motor Starter Co., Franklin, Pa.

3—The wheelbase, wheels, pressure system and the pistons and connecting rods are claimed to be the only non-stock portions of the chassis of the Stutzes that competed at Milwaukee. Of course the gear ratio was higher than stock, but inasmuch as the rear axle was stock and permitted of these changes, according to the A. A. A. rules this would not prevent it from being considered a stock chassis in this respect. Of course the wheelbase and wheel changes ruled it out of the strictly stock chassis category. The gear-set and motor other than the changes cited above, are claimed to be stock.

Delco System Explained

Splitdorf Synchronous Ignition and Unit Electric Starting, Lighting and Ignition Outfit

ALBANY, N. Y.—Editor Motor Age—I would like an explanation with diagram showing the internal connections of the Delco system, in which both the battery and magneto currents may be traced.

2—I would like the same information in regard to the Splitdorf two-point ignition system.

3—I would like to know the formulae for body polish as used by the manufacturers of the Thomas, Pierce-Arrow, and Peerless cars.—John Bastian.

1—The Delco system consists of a motor-generator, a controller and a storage battery, which furnish current for the ignition, illumination, and starting of the engine of a motor car. The first function is accomplished by taking the current from the controller as a primary current, and inducing a high-tension current with it in a single-unit induction coil, which high-tension current is distributed to the spark plugs of the engine by a gear-driven distributer, included in the generator group. The second function is accomplished by taking current from the controller at 6 volts, and conducting it through a lighting switch to the individual sets of lamps, in parallel.

The third is accomplished by switching the current from the battery back through the generator, in a series winding, distinct from the multiple winding employed in charging. The generator is carried as an accessory to the engine, being gear-driven

EDITOR'S NOTE—To the readers of the Clearing House columns: Motor Age insists on having bona fide signatures to all communications published in this department, not necessarily for publication but as an evidence of good faith. Motor Age will not publish communications where this rule is not lived up to.

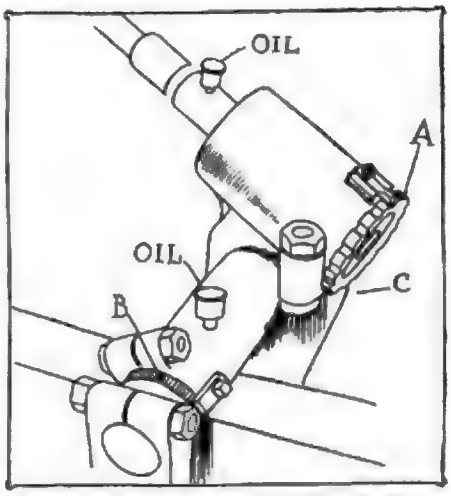


FIG. 4—POINTS OF ADJUSTMENT ON MAXWELL STEERING-GEAR, SHOWING OILING POINTS

positively by it. The battery is carried, with the controller and an ampere-hour meter, in a box on the running-board of the car. The controller is operated by the clutch pedal, while the lighting switch and the switch end of the ignition coil are carried on the dash.

The generator is a compound-wound dynamotor, whose fields are in two sets, multiple wound for charging the battery, and series wound for use as a motor in cranking. The same armature is used for both purposes. There are two sets of gearing to the motor, one of which is direct from the timing gears as a generator drive, and the other, a reduction gear to the toothed flywheel of the engine, for use as a motor in starting. The controller consists of a number of switches, so arranged that at one position, the battery is wired to the series winding of the generator, converting it into a motor, and in the other, in multiple to the four sets of cells, of which the battery is composed, to the multiple winding of the generator, for charging. A differentially-wound automatic cutout breaks the charging circuit upon the speed of the motor falling so low that the current flows back from the battery to the generator armature, thus preventing exhaustion of the battery.

The battery consists of twelve cells, arranged in groups of three, of 6 volts each. These sets are normally wired in multiple to the generator, which charges them at 6 volts, and to the ignition and lighting system, to which the battery discharges at the same pressure. In starting, however, the battery current is taken in series, at 24 volts. The capacity of the battery at 6 volts is 80 ampere-hours, while at 24 volts it is 20.

In starting, the clutch-pedal is pushed out, with the spark retarded. This operation meshes the reduction gears of the generator-motor with the toothed flywheel, and moves the controller to the position wherein all cells of the battery are wired in series to the series winding of the dynamo, at the same time operating the starting clutch, which locks the starting mechanism fast to the clutch pedal. When the engine responds, the spark is advanced, and the pedal released, whereupon the controller is shifted to its normal position again, so that the battery is wired to the generator and outlet wires in quadruple series-multiple, the output being in the form of a 6-volt 80 ampere current. The 1913 Delco has embodied several changes in this arrangement, which will be described in Motor Age in the near future. The present Delco system is shown complete in Fig. 6.

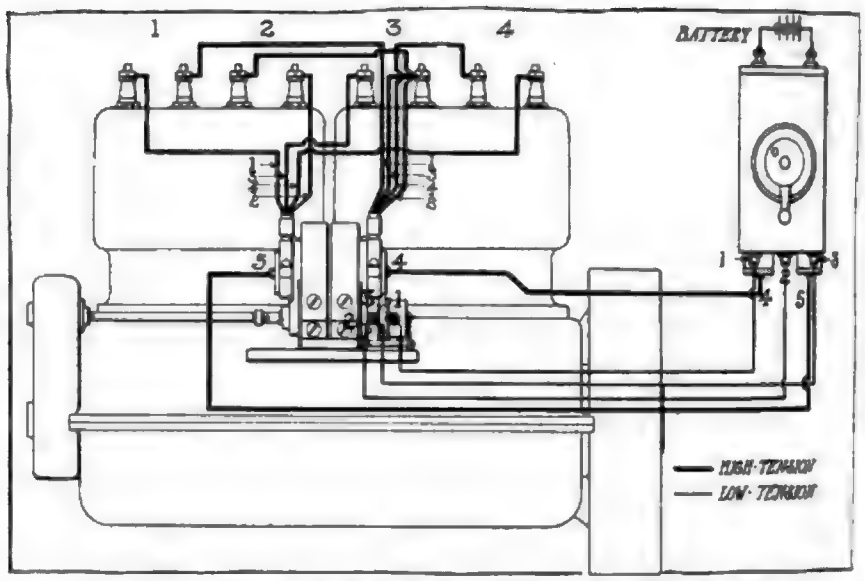


FIG. 5—SPLITDORF DOUBLE SPARK MAGNETO WIRING DIAGRAM

2—The Splitdorf synchronous two-spark system is shown in Fig. 5. This consists of the usual dual magneto and battery ignition system, with the addition of a second high-tension distributor on the magneto. The wiring to the dash coil, is by two low-tension wires, a primary ground and primary wire to conduct the battery primary to the magneto-breaker; a wire to the battery; another to the engine ground; and two high tension wires, from the magneto-breaker to the distributors. In addition to these another low-tension wire leads from the primary on the magneto through the dash switch to the ground wire, for the purpose of grounding the primary circuit in stopping to prevent burning out the magneto armature.

3—For many years the Peerless company has used no body polish, either at the factory or its branches. The cars are washed and cleaned in a full stream of slow-running water, without the use of any soap, chemical, or cloth. When the dirt is removed, and the varnish is exposed, it is dried and polished with chamois. If the surface is scratched it is rubbed down and refinished with finishing varnish.

The Pierce-Arrow company uses three formulae. The first, for warm weather, consists of equal parts of raw oil and water. The second, for the removal of oil and tar, such as is thrown up from freshly treated roads, consists of two parts of raw oil, one part of coal oil, and one part of water. The third, for well seasoned varnish, and winter use, consists of two parts of white vinegar, and four parts of cottonseed or sweet oil. After polishing, a clean cloth, dampened with alcohol is used to remove any grease that may remain. The Thomas is no longer in business.

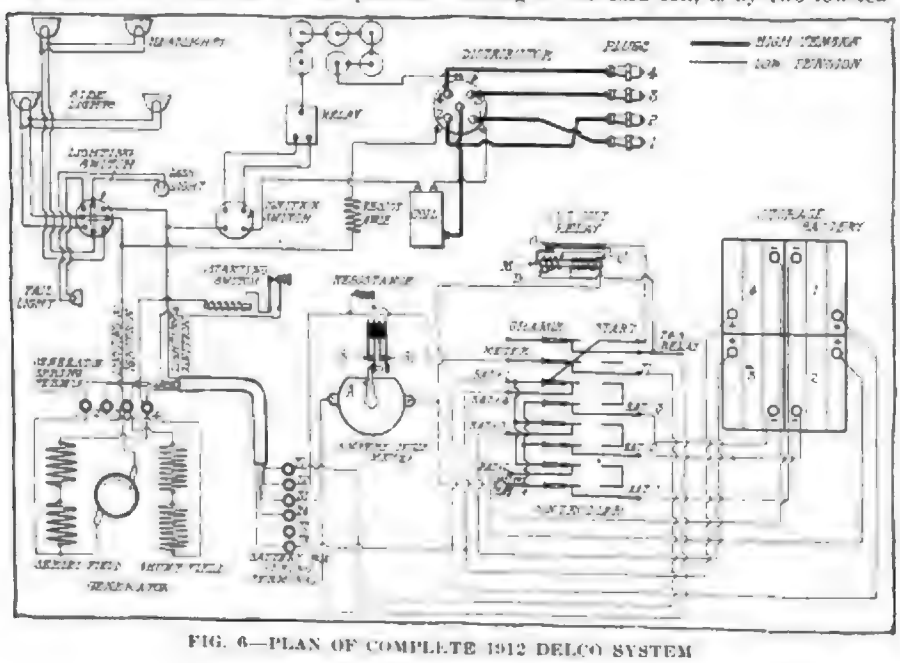


FIG. 6—PLAN OF COMPLETE 1912 DELCO SYSTEM

ADJUSTMENTS ON MAXWELL

Stromsburg, Nebr.—Editor Motor Age: I would like directions for adjusting the steering gear on a 1912 Maxwell Massey.

2. How can I stop the noise of the driving gears in the rear axle. It makes a very disagreeable noise when running about 10 miles an hour, yet I believe the bearings are all right.—Reader.

1. There are three adjustments on the steering gear. The first, A, in Fig. 4, is a large nut which when turned to the

right takes up on the thrust bearing of the main steering pillar. This nut is castellated and locked by means of the small finger shown. This finger is loosened or tightened, to be slid forward or back, by means of the set screw on top. The second adjustment is on the sector shaft. This consists of an eccentric bushing which is turned by means of nut B, in the figure, for the purpose of bringing the sector closer to the worm. This is likewise secured by a locking finger, engaging knurls on the nut. The nut is turned by the aid of a punch, in the hole which appears at the top. The third adjustment is for end-play on the sector shaft and is located on the inner end of the shaft, as indicated by the arrow, C.

3. I would also like to know just how by means of adjustment, the usual recourse being the substitution of a new driving pinion. The adjustment is in the form of the usual nut at the front of the housing, which takes up the thrust on the drive-shaft. To replace the driving pinion requires the removal of the shaft from the housing, although the rear axle proper need not be disturbed. This is a 3-hour job, and the new pinion will cost you $7.

HORSEPOWER FORMULAE

Hoosac, N. Y.—Editor Motor Age—Kindly publish some horsepower formulas, both American and foreign.—L. S. A.

The standard horsepower formula of the world is the S. A. E. formula, which originated with the Association of Licensed Automobile Manufacturers, of which the Society of Automobile Engineers is the outgrowth. This formula is based on that of the Royal Automobile Club of Great Britain. The S. A. E. formula is:

$$H.\ P. = \frac{D^2N}{2.5}$$

In which D=Diameter of cylinder in inches,

and N=Number of cylinders, at an assumed piston speed of 1,000 feet per minute.

The British form has been modified to 4 D^2 x N, and was recently supplanted by 0.464 n(D plus L) (D—1.18) after laboratory tests.

A great deal of dissatisfaction with this formula has been found in both America and Europe. Since the popularity of the long stroke has become so great, it has been found that while, to a limited extent the S. A. E. formula takes stroke into account, the results are not accurate as applied to this form of motor. The following formula has frequently been suggested as a substitute that would give the same results as the S. A. E. in motors of short stroke, but which would give due allowance for the increased power for a given bore to be found in the long-stroke motor.

$$H.\ P. = \frac{D^2 S N R}{12000}$$

In which D=Diameter of the cylinder in inches,

S=Stroke in inches

N=Number of cylinders,

and R=Revolutions per minute.

The Institute of Automobile Engineers of England recently recommended the following rating as a basis for taxation, to supercede the R. A. C. formula:

$$H.\ P. = K\ D(AD\ S)\ N$$

In which D is the diameter of the cylinder in inches,

S is the stroke,

and N is the number of cylinders.

K and A have not been ascribed values.

F. H. Royce, of Rolls-Royce, Ltd., of England, has suggested the following:

$$H.\ P. = \frac{S \times N \times .2}{(D(D-1) \times (D+2)}$$

In which D=Diameter of the cylinder in inches,

S=Stroke in inches,

and N=Number of cylinders.

The Automobile Club of France adopted the formula below in 1906:

$$H.\ P. = 0.0028\ D_2 \times N$$

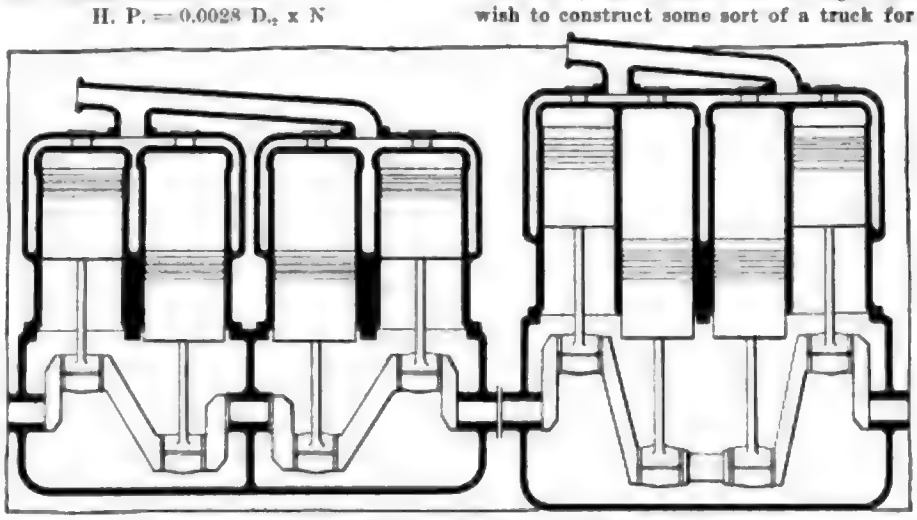


FIG. 7—STRUCTURAL ECONOMY OF LONG STROKE MOTOR

In which D=Diameter of cylinder in inches,

and N=Number of cylinders.

The present French rating, as adopted by the Automobile Club of France, is the same as the former English rating, except that it is taken in millimeters instead of inches.

and n is the number of cylinders.

Motor Age, taking the calculations from square motors which formed the basis of the S. A. E. formula as accurate, has computed the following amplified rating, based on the standard formula, and which has been termed the modified S. A. E. rating:

$$H.\ P. = \frac{D^2\ N\ S\ R}{15000}$$

In which D is the diameter of the cylinder in inches,

N is the number of cylinders,

S is the stroke in inches,

and R is the revolutions per minute.

This has been found quite satisfactory, as based on the standard formula, recognized on two continents, and differs only in that it has been amplified so that piston speed instead of being a constant is separated into its variable factors, stroke and crankshaft speed.

For two-cycle cars, the above formulas will, of course, be too conservative, as it is generally conceded that a well-designed two-cycle motor will give greater power for a given piston displacement than a four-cycle motor. The following two-cycle horsepower formula has been suggested:

$$H.\ P. = \frac{D^2LRN}{13,500}$$

In which:

D is the diameter of the cylinder in inches,

L is the length of the stroke in inches,

R is the revolutions per minute,

And N is the number of cylinders.

CRADLE FOR CRIPPLED CARS

Streator, Ill.—Editor Motor Age—We wish to construct some sort of a truck for use in bringing in cars with broken rear axles, something which we could slip under the rear end so that they can be towed in. We would thank Motor Age or its readers for any suggestions that would help us out in designing such an article.—C. Stauber.

The design in Figs. 1 and 3 is of a cradle truck to be slipped under the rear of the car, constituting a truck for transportation, and a jack in one. The long tongue is slipped under the body and the adjustable chairs are raised as high as possible, and the front end of the tongue raised to the height of the front axle and tied or chained in place. The rope or chain that is used for this purpose should be secured to the tongue a little behind the front axle, so as to prevent the cradle slipping back. The car should be towed from the front springhorns as usual. The wheels and axle of the truck may be taken from an old cultivator, or purchased from the repair stock of an implement manufacturer. The frame is secured beneath the axle to enable it to clear the low tanks found on many cars.

The Motor Car Repair Shop

Old Files as Scrapers

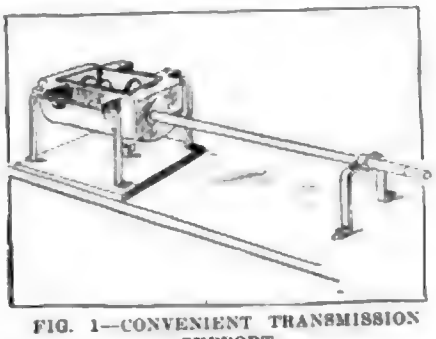


FIG. 1—CONVENIENT TRANSMISSION SUPPORT

Old Files Make Good Scrapers

AMONG the many homemade tools to be seen in many motor car repairshops there are perhaps but few that can be as easily made as a scraper for fitting crankshaft bearings, etc. Old files make good scrapers, particularly old half round files such as shown at the top of Fig. 2, and to convert it into a scraper one has but to apply it to an emery wheel and grind off the teeth; then grind it into the form shown below in Fig. 2, or into any form desired or most useful in the work for which it is intended. If one wishes to hasten the operation of grinding and has the facilities for annealing and hardening the file, it can be annealed, then filed or ground or forged into shape, and the scraping part rehardened and tempered and ground sharp.

To anneal a file one has but to heat it to a uniform cherry red color, then allow it to cool slowly in the ashes beside the fire, in the air, or preferably in powdered lime. It must not be quenched in water. This process softens the metal so that it can be readily cut with another file or cutting tool, and more easily with an emery grinder; and it also may be bent cold to a certain limited extent, though it generally is advisable to make all bends while the file is red hot. After the file has been formed into a scraper in the annealed state it can be hardened and tempered by again heating it to a cherry red color, then holding it in a vertical position with the scraper part downward, immerse the whole of the scraper part into cool water and move about until it has lost its red color; at this point it should be withdrawn from the water and some smooth portion of it quickly cleaned off with sand paper or emery cloth so that the change of color as it cools may be seen. When it has taken on a light yellowish straw color, drop the whole file into the water and leave it there until it is entirely cool, when it will be found that the scraping portion is quite hard and ready to have a keen and durable cutting edge ground on it. A piece of metal cools most quickly if moved around in the water and in tempering it generally is necessary to cool the parts quickly.

Convenient Transmission Support

In order that the labor of one workman of a large repairshop might be facilitated, supports were provided for the transmission gearbox and the propeller shaft attached thereto as illustrated in Fig. 1. These supports render the handling of the gearcase so convenient that much difficulty and time would now be required to do the same work without them, and it is also claimed that much better workmanship is obtained through the use of such equipment. The gearbox is mounted on and secured to two band iron supports, which are in turn secured by studs to a heavy cast iron plate, and the plate is itself secured to the workbench by means of a bolt and thumbnut. The other little support, which is provided to form a bearing for the end of the propeller shaft, also is made of band iron and readily removable from the bench. By having this equipment quickly detachable it is possible to clear the bench for other operations. Such equipment costs but little. Often it can be made by the workmen at times when work in the shop is slack, while the material usually can be obtained from the scrap heap of one's own shop, or that of another. Anything in the way of equipment that will facilitate operations and make for better workmanship is to be recommended, especially when it can be obtained at a reasonable cost.

Rack for Rear-Axle Shafts

In Fig. 3 is shown a rack made from band iron about 1-inch wide and about ¼-inch thick. It comprises a very easily made framework which is divided off into sections suitable for holding rear-axle shafts and the like in a convenient and orderly fashion. It has been said that the acme of good order is to have a suitable place for everything and then keep every thing in its place. Two of the advantages of this rack therefore are that it provides a place for these shafts while motor cars are dis-assembled for repairs, and in so doing makes it possible for the workmen to keep these features of the car in the place provided. In a word, it promotes order in the repairshop. There is another advantage in a structure of this kind, however, that is worth mentioning. It is a well known fact that shafts such as these and camshafts and crankshafts, etc., are very easily bent out of true by a slight jar such as might be received when one of these shafts happens to topple over, or be dropped, whilst a heavy crankshaft has been known to be sprung by simply securing one end of it in a vise without a support at the outer end. This makes it necessary to handle shafts of this character with great care when removed from their respective places on the car; and the use of suitable racks and supports for such shafts in the motor car repairshop is to be encouraged by every motorist and repairman.

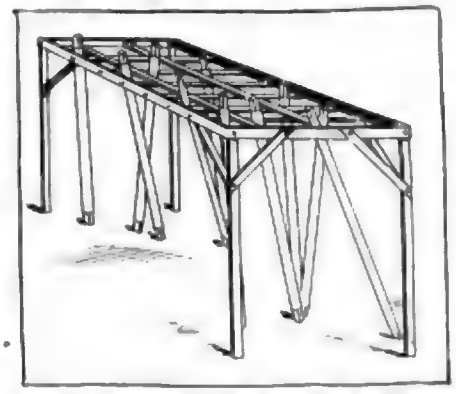


FIG. 3—HANDY RACK FOR REAR AXLE SHAFTS

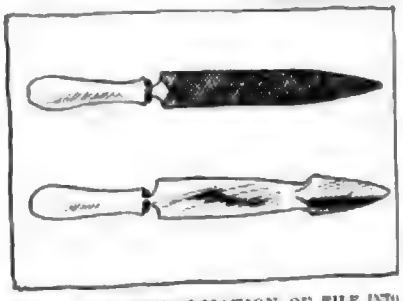


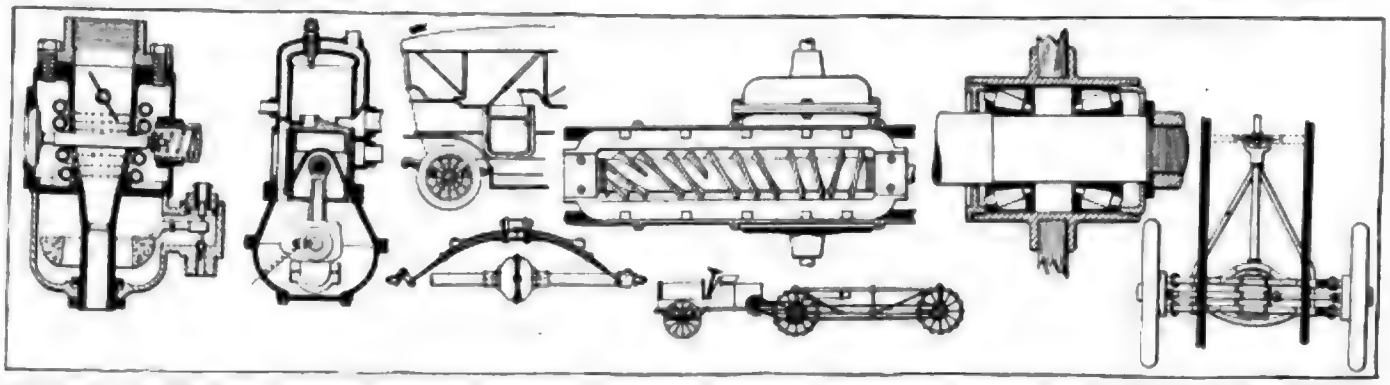
FIG. 2—TRANSFORMATION OF FILE INTO SCRAPER ILLUSTRATED

Grinding Clutch Disks

Disk clutches if wrongly adjusted in the first place will start slipping, which movement very soon rubs away the lubricant between the rings, and the result is a continual grating until the clutch locks and takes up the drive solidly. When plates get to this stage there is only one remedy and that is to replace them with new members or have the old ones ground.

In connection with this operation a new method of smoothing the plates has been brought out by an English concern, which uses a magnetic chuck on the grinding machine. These tools are admirably adapted for this work. Each of the thin rings is simply laid against the chuck and the electricity turned on, whereupon it is held firmly against the face of the plate and there is not the least fear of its being in any way distorted. By this method the metal may be ground smooth on one side and then reversed.

Current Motor Car Patents



STEWART CARBURETER WINTON ENGINE—PACKARD CURTAIN CARRIER—DRIESBOCH CHANGE-GEAR—CHRISTOPHERSON BEARING HUPMOBILE SPRING LINN TRACTOR HILL-DRIVE SYSTEM

ROLLER Bearing—No. 1,045,814—To Herbert Christopherson, East Orange, N. J., assignor to New York Oilless Bearing Co., New York. Filed August 7, 1911, dated December 3, 1912. This bearing, while of the roller type, operates on a principle new to this type of bearing. The large diameter portion of the rollers bear upon opposing cones, while smaller-shouldered ends of the rollers bear on smallface ledges. Additional retaining ledges are provided to provide adjustment of the bearing, and to retain the rollers in proper position.

Packard Door Curtain Carrier—No. 1,045,861—To Allen Loomis, assignor, by mesne assignments to Packard Motor Car Co., Detroit, Mich. Filed November 6, 1908, dated December 3, 1912. To enable the side curtain of a motor car door to be carried by the door, independent of the top or its supports, so that it may be swung open or closed without having to disconnect the side curtain. This device consists of a frame provided with fasteners to be secured to the door.

Hupmobile Rear Spring—No. 1,046,273—To Kenneth Crittenden, Detroit, Mich. Filed July 12, 1910, dated December 3, 1912. This spring is of the transverse semi-elliptic type, secured at its middle to a cross member of a motor car frame, and at its extremities, by means of shackles to an extension lug on the brake drum flanges. The feature of this spring is that, owing to the fact that it is not situated directly above the axle, but a slight distance behind it, the distance between points of support on the chassis frame is lengthened, thereby increasing its ease of riding. This necessitates an allowance for the motion of the axle on the frame, which is provided for by mounting the middle of the rear frame on a swivel-bracket.

Stewart Pre-Heating Carbureter—No. 1,046,344—To John K. Stewart, Chicago. Filed July 27, 1911, dated December 5, 1912. To adapt it to the use of low-grade fuels, this carburetor, while of the usual venturi-tube type, float fed, differs from others in that means is provided for the pre-heating of the auxiliary air. This is accomplished by air-jacketing the mixing tube and providing communication from the tube to the jacket by means of perforations in the walls of the tube. The auxiliary air valve is located in the walls of the jacket, and the air on being drawn in must pass through a coil of hot tubing. This tubing, preferably of copper, because of its thermal conductivity, is connected to a source of heated fluid, which may be the water in the cooling jackets of the motor, or the exhaust; supposedly the latter for use with low-grade fuels.

Tractor for Trucks—No. 1,045,992—To James W. Linn, Oregon City, Ore. Filed December 29, 1910, dated December 3, 1912. This patent relates to a power tractor with front steering wheels, a motor and rear driving wheels, the latter constituting the front axle and wheels of a load-carrying trailer. The trailer is provided with a rear axle and wheels, and is pivoted to the live front axle by means of a ball joint. This ball carries a swivel gear, to correspond to a gear on the rear axle, a chain carried by the two gears being provided to revolve the rear axle with the middle one, the swivelled ball and gear permitting the truck to swing on the forward driving axle.

Winton Two-Cycle Engine—No. 1,046,359—To Alexander Winton and Harold B. Anderson, Cleveland, Ohio, assignors to Winton Motor Carriage Co., Cleveland, Ohio. Filed April 2, 1908, dated December 3, 1912. Peculiar interest attaches to this motor because of the assignment to the manufacturer of a four-cycle car, but features are included that impart to it individual merit for consideration. The engine is of the two-cycle, three-port type with the intake port below the bottom of the piston stroke, and opened on the upstroke of the piston. Crankcase compression is used, the inlet being through a second port and exhaust through a third, the latter two being at the bottom of the piston stroke, and uncovered on the downstroke of the piston. The feature of the construction of this motor is the form of inlet employed. Instead of the gas being admitted above the piston, and being deflected up one side of the cylinder by a deflector on the piston; the piston is provided with a passage, registering with the inlet port at the proper time. This passage opens into the cylinder through a vertical nozzle, being projected to the top of the cylinder, and on reaching the top of the compression or instroke, inclosing the spark plug in a body of prime gas. Ignition therefore takes place in a body of gas totally free from burned gases, promoting the rapid propagation of the flame, and efficiency of the motor.

Variable-Speed Transmission—No. 1,046,157—To Charles A. Dreisbach, New Haven, Conn. Filed October 11, 1911, dated December 3, 1912. To provide a gear-change for motor vehicles and the like, this device consists of a multiple worm drive mechanism, consisting of a worm-shaft carrying worms of different pitch, and at least one of reverse pitch, and a roller-sprocket, to engage the threads of the worm, thereby to be revolved. The worm-shaft is adapted to be slid to bring worm portions of different pitch selectively into mesh with the roller sprocket, and means to lock the worm in a given position.

Transverse Cardan Drive System—No. 1,046,388—To Louis A. Hill, Washington, D. C., assignor to Pneucar Co., Washington, D. C. Filed November 4, 1911, dated December 3, 1912. A live rear axle combination, this invention comprises a pair of wheels mounted on a dead axle frame, upon which is resiliently supported a differential and case, connecting with the engine by a cardan shaft, and with the road wheels by means of flexible drive axles. The body frame is in turn supported on the differential housing by means of an additional resilient element. This invention is more fully described on another page of this issue.

Brief Business

PEMBROKE, Ont.—Thomas Pink & Co. are going to build a garage in this city.

Enderby, B. C.—E. J. Mack and H. G. Mann are opening a garage here.

Toronto, Ont.—The Standard Motors, Ltd., 107 to 203 Victoria street, will handle the Mitchell car for Toronto and vicinity.

Minneapolis, Minn.—The Republic Rubber Co. will have a home in the new Murphy building at Thirteenth street and Hennepin avenue.

Philadelphia, Pa.—A new sales, service and garage building for the Universal Motor Truck Co. is in course of construction at 1717-1721 North Twenty-second street.

Indianapolis, Ind.—A new garage has been opened at 23 McLean place, Indianapolis, by A. L. Duggan, who for the last 3 years has been identified with the Twenty-second street garage in this city. Duggan expects to take steps to obtain some agencies.

Atlanta, Ga.—H. C. Whitney has been appointed manager of the Atlanta branch of the Locomobile Co. of America, the post formerly held by the late Frank P. Day, of Hartford, Conn. Mr. Whitney was for a long time connected with the American Locomotive Co., having general supervision of sales for the southern states.

Newcastle, Ind.—A motor car sales agency and garage will be conducted at Newcastle by the newly organized Rose City Auto Co., which has been incorporated with an authorized capitalization of $10,000. The directors and principal stockholders are Frank E. Smith, general manager of the Newcastle Maxwell-Briscoe motor plant; Charles W. Mouch, William F. Byrket, Howard M. Van Matre, Gordon Cameron, Lawrence Bailey and Albert D. Ogborn, all of Newcastle.

Detroit, Mich.—J. J. Martin has become a traveling representative of the Commerce Motor Truck Co., which concern is working out a new line of machines which will be brought out around the first of the year.

Minneapolis, Minn.—C. J. Pettit, manager of the Prest-O-Lite Co.'s New York branch, has been transferred to Minneapolis, where he now has charge of three

Recent Incorporations in the Motor Industry

Akron, O.—Motor Starting Co., capital stock, $25,000; to manufacture motors and deal in supplies; incorporators, R. A. Woods, M. Paul, A. M. Tschantz, E. W. Paul, C. L. Dinsmore.

Appleton, Wis.—Appleton Motor Car Co., capital stock, $15,000; to deal in new and second-hand cars; incorporators, J. A. Schmit, J. A. Kronser, J. McCann.

Augusta, Me.—McTernan Rubber Mfg. Co., capital stock, $1,000,000; incorporators, E. M. Leavitt, E. L. McLean.

Baton Rouge, La.—White Motor Car Co., capital stock, $10,000; incorporators, S. A. Craig, G. A. Puryear, W. H. Hyde, E. S. Craig, E. E. Wood.

Bedford, O.—Bedford Supply Co., capital stock, $10,000; to deal in motor cars and supplies; incorporators, F. B. Senter, F. H. Calvert, G. W. Show, N. C. Boyd, A. B. Condon.

Boston, Mass.—Motor Supply Shop, capital stock, $25,000; incorporators, M. V. O'Neil, W. R. McDaniel.

Buffalo, N. Y.—Velie Motor Sales Co., capital stock, $20,000; incorporators, E. F. Snyder, J. J. Finerty, G. Frank Sherwin.

Camden, N. J.—Geiger-Piersz Construction Co., capital stock, $100,000; to sell improved wheels for motor cars; incorporators, J. C. Geiger, W. T. Piersz, A. M. Garrison.

Chicago—Parmelee Motor Livery and Garage Co., capital stock, $10,000; incorporators, G. B. Van Norman, C. O. Parmelee, L. G. Doyle.

Chicago—A. W. Greiner Auto Sales Co., capital stock, $25,000; trade in motor cars; incorporators, A. W. Greiner, M. Feinberg, C. E. Becker.

Chicago—Electric Vehicle Maintenance Co., capital stock, $2,500; to repair electrics; incorporators, W. Knobloch, W. C. Russel, H. A. Tarantores.

Chicago—Illinois Tire Filler Co., capital stock, $10,000; to manufacture and deal in motor car tires; incorporators, A. Jacobs, A. Perval, C. B. Stafford.

Chicago—Alton Automobile Co., capital stock, $10,000; incorporators, H. F. Horstman, W. Winter, L. F. Winter.

Chicago—Storm Shield Mfg. Co., capital stock, $100,000; to manufacture accessories; incorporators, R. B. Wighton, L. E. Street, N. P. Street.

Chicago—Grove Auto Truck Garage Co., capital stock, $50,000; incorporators, T. E. McNeill, H. L. McCurdy, W. H. Neterer.

Cincinnati, O.—Citizens Auto Service Co., capital stock, $7,000; to operate motor vehicles for service purposes; incorporators, W. H. Davis, F. W. Kelly, L. J. Hoppo, A. Putman, J. Louis Kohl.

Cleveland, O.—Dayton Airless Tire Sales Co., capital stock, $10,000; to deal in tires, incorporators, W. A. Carey, H. Krejci, F. W. Chandler, R. M. Edwards, M. Otter.

Columbus, O.—Bracken-Stauton Tire Co., capital stock, $5,000; to deal in motor car and truck tires; incorporators, W. F. Bracken, M. B. Stauton, L. A. Stauton, L. A. Stauton, M. Bracken, T. E. Curtin.

Dayton, O.—Dayton Equipment Co., capital stock, $10,000; to manufacture and deal in accessories; incorporators, H. Stoddard, G. L. Baker, G. J. Loomis, W. C. Smith, C. D. Heald.

Detroit, Mich.—Detroit Auto Heater Co., capital stock, $2,000; to manufacture motor car heaters; incorporators, O. F. Zahn, E. L. Zahn, H. S. Durand.

Dover, Del.—Light Commercial Car Co., capital stock, $100,000; incorporators, H. E. Latter, W. J. Maloney, N. P. Cifin.

Galesburg, Ill.—Martin Matteson Auto Co., capital stock, $10,000; incorporators, W. P. Martin, Mrs. W. P. Martin, S. D. Matteson.

Glen Cove, N. Y.—Glen Cove Garage, capital stock, $1,000; incorporators, T. F. Meade, E. Lewis, L. Lewis.

Gloucester, Mass.—Twin Light Garage Co., capital stock, $10,000; directors, J. F. Perkins, F. A. Corliss, A. A. Anderson.

Agencies Appointed by Motor Car and Truck Manufacturers

PLEASURE CARS

Town—	Agent	Car
Tacoma, Wash.	E. M. Streeter	Cole
Wellsburg, W. Va.	W. J. Hervey	Cole
York, Neb	Corcoran & Foley	Cole
Harrisburg, Pa.	Royal Auto Garage	Pullman
Easton, Pa.	Lafayette Motor Car Co.	Pullman
Portland, Ore.	Braly-Dubois Auto Co.	Apperson
Los Angeles, Cal.	Benrich Motor Co.	Moline
Providence, R. I.	Providence Auto Co.	Velie
Lynn, Mass.	W. W. Whitney & Co.	Cole
Lawrence, Mass.	Jackson Street Garage	Cole
Fall River, Mass.	F. W. Davis & Co.	Cole
Blairsville, Pa.	Blairsville Auto Co.	Lozier
Columbia, S. C.	Phil D. Kohn	Lozier
Newark, N. J.	Lozier-Stutz Sales Co	Lozier
Roanoke, Va.	Hunter Motor Co.	Lozier
Uniontown, Pa.	Keystone Automobile Co.	Lozier
Tifton, Ga.	H. H. Tift, Jr.	Lozier
Little Rock, Ark.	H Tysinger	Lozier
Wichita, Kans.	Peru-Van Zandt Implement Co.	Westcott
Augusta, Ga.	R. J. Edenfield	Westcott
Campbellstown, O.	John C. Markey	Westcott
Piqua, O.	Gilbert F. Fryling	Westcott
Brockton, Mass.	William H. Marble Auto Co.	Westcott
Galesburg, Ill.	Galesburg Motor Car Co.	Westcott
Champaign, Ill.	William H. Miller	Westcott
Erie, Pa.	H. Mankel	Westcott
Bedford, Ind.	Patterson & Glover	Westcott
Peoria, Ill.	George J. Smith	Westcott
Little Rock, Ark.	Westcott Motor Car Co.	Westcott
Washington C. H., O.	Moore & Jamison	Westcott
Dayton, O.	Westcott Motor Car Agency	Westcott
Union Springs, Ala.	Charles W. Tway	Westcott
Canton, S. D.	A. N. Bragstad	Westcott
New York	Richardson-Orr & Co.	Westcott
Columbus, Neb.	Columbus Automobile Co.	Empire
Pompton Plns., N. J.	W. H. May	Empire
Mokane, Mo.	R. W. Taylor	Empire
Pender, Neb.	Silas Lieb	Empire
Mascoutah, Ill.	Schoepp & March	Empire
Brighton, Ill.	W. G. Hunt	Empire
Baltimore, Md.	Walter Scott	Premier
Baltimore, Md.	Shaffer Mfg. Co.	R. C. H
Phoenix, Ariz.	George Hageman	Oakland
Phoenix, Ariz.	Belt Wilson and Robert T. Jones	Michigan
Toronto, Can.	Langton Motor Sales Co.	Locomobile
Calgary, Can.	Central Garage & Machine Shop	Cole
Cheyenne, Wyo.	Boyle & Joffee	Cole
Columbia, Mo.	Columbia Automobile Co.	Cole
Dayton, O	Cole Sales Co.	Cole
Durham, N. C.	John H. Harris	Cole
Edmonton, Can.	International Motor Co.	Cole
Emerald, Wis.	W. S. Fleming	Cole
Hempstead, L. I.	W. T. Hutcheson	Cole
Hillsdale, Mich.	Dr. H. C. Miller	Cole
Knightstown, Ind.	M. E. Reagan	Cole
Lincoln, Neb.	Joe Simon	Cole
Lynfield, Mass.	E. M. Elder	Cole
Maitland, Mo.	Rowlette Auto Co.	Cole
Marks, Miss.	J. H. Edwards	Cole
Martin, Tenn.	G. E. Bowden	Cole
McMinnville, Ore.	Younger & Prigmore	Cole
Morgantown, W. Va.	Colonial Motor Car Co.	Cole
Mt. Auburn, Ill.	H. S. Armstrong	Cole
New Bern, N. C.	H. Evans Sledge	Cole

Announcements

New Concerns Launched in Business World

Houston, Tex.—Cartercar Co., capital stock, $20,000; incorporators, R. H. Bushway, E. Emmert, C. D. Ferguson.

Huntington, Ind.—Huntington Auto Transit Co., capital stock, $25,000; to conduct bus line; incorporators, O. E. Bradley, J. M. Hicks, J. W. Caswell, S. A. Stemen, W. W. Hawley.

Indianapolis, Ind.—Auto Lamp & Number Co., capital stock, $3,000; directors, R. Griffin, A. P. Conklin, R. H. Bruce, W. F. Johnson, G. L. Maas.

Kansas City, Mo.—England Brothers Motor Car Co., capital stock, $2,000; incorporators, E. England, E. W. England.

Lynn, Mass.—Suffolk Street Garage, capital stock, $5,000; directors, J. Buckley, D. Lynch, H. Thomas.

Muskogee, Okla.—Pioneer Motor Co., capital stock, $5,000; incorporators, G. S. Waddell.

New York—Gumprice Motor Truck Co., capital stock, $1,000,000; to manufacture motor cars and supplies.

New York—American National Motor Bus Co., capital stock, $1,000,000; to deal in motor buses; incorporators, C. A. Clarke, S. L. Conklin.

New York—Blair Motor Truck Co., capital stock, $5,000; incorporators, H. O. Lente, F. W. Dix, H. O. Lente.

New York—Hollister Standard Motor Co., capital stock, $675,000; to conduct motor car business; incorporators, W. H. Langford, L. White, H. H. Sevier.

New York—Queensboro Garage, capital stock, $10,000; incorporators, F. L. Jockers, A. Jockers, D. J. Stack, A. M. Stack.

New York—Schacht Motor Car Co., capital stock, $60,000; incorporators, B. Cukor, H. V. Radonitz, C. J. Terrill.

New York—Motor Dealers' Contest Association of New York, capital stock, $30,000; incorporators, I. M. Uppercu, E. Lascaris, J. C. Nichols.

New York—Motor Trading Co., capital stock, $10,000; to conduct motor car business; incorporators, W. A. Shepard, R. W. Tindall, A. Donces.

New York—Rolaff Oil Carburetor Co., capital stock, $25,000; to manufacture and sell carbureters; incorporators, R. Wolfsky, J. W. Stone, W. G. Van Vleck.

New York—F. W. Offeldt & Sons, capital stock, $20,000; to deal in motor trucks; incorporators, E. Y. Eltonhead, E. G. Ofeldt, F. A. Ofeldt.

New York—United Rubberine Supply Co., capital stock, $200,000; to deal in tire fillings; incorporators, H. Mayer, T. H. Royce, C. L. Bookheim.

Ottawa, N. Y.—Phoenix Automobile & Truck Co., capital stock, $50,000; incorporators, J. G. Charrier, S. Borderleau, A. Bordeleau, N. DeGrandmont, E. A. Brodcur.

Philadelphia, Pa.—Hindley Gear Co., capital stock, $10,000.

Philadelphia, Pa.—Auto Safety Signal Lamp Co., capital stock, $100,000; incorporators, L. Abeles, J. J. Drew, J. G. Gray.

Pontiac, Mich.—Pontiac Motor Castings Co., capital stock, $8,000; incorporators, W. J. Brown, P. J. Donnelly, T. E. Lyons.

Rochester, N. Y.—Rochester Macandaruba Tire Filler Co., capital stock, $10,000; incorporators, J. S. Crosier, A. C. Olp.

St. Louis, Mo.—Locomobile Co. of Missouri, capital stock, $10,000.

St. Louis, Mo.—Black Hawk Motor Co., capital stock, $150,000.

Waco, Tex.—Waco Auto Supply Co., capital stock, $5,000; incorporators, W. H. Montz, H. B. Lyne, J. Harrison.

Youngstown, O.—Cartercar Sales Co., capital stock, $10,000; to deal in motor cars and trucks; incorporators, W. Beight, F. M. Mayberry, C. H. Geiger, F. E. Callor, J. F. Beight.

branches—Minneapolis, St. Paul and Winnipeg.

Chicago.—The Centaur Motor Co., Chicago distributor of the Abbott-Detroit, has secured larger quarters and will shortly take possession of the new premises, located at 2246 and 2248 Michigan avenue.

Minneapolis, Minn.—The Dispatch Motor Car Co. has leased new quarters at 511 Fourth avenue S. The company is preparing to begin manufacture in the spring of a light delivery, as well as a pleasure car line.

Lansing, Mich.—The B. F. Goodrich Co., of Detroit, has increased its capital from $10,000 to $500,000.

Des Moines, Ia.—The Riddell Auto Co., of Des Moines, has opened a branch house at Oskaloosa to handle Overlands in that section of the state.

San Francisco, Cal.—A. Armuth has been elected secretary of the Inter-State Co., which is the Pacific factory branch of the Piggins truck.

Pittsfield, Mass.—Edward S. Jacobson, Floyd A. Knight and John J. Whittlesey have formed the J. and B. Co., at Pittsfield, to make ignition and other motor accessory appliances.

London, Ontario.—The Ford Motor Co. has opened a new branch at London. W. H. Smith, who has been with the Ford at Toronto for the last 4 years, has been appointed manager.

Milwaukee, Wis.—The Jonas Automobile Co., representing the Cadillac, has moved into its new home, the Cadillac building, at Eighth and Wells streets, Milwaukee. The former quarters at 417-421 Wells street are now occupied by the Wolleager Auto Sales Co., successor to the Milwaukee branch of the Studebaker Corporation.

Rochester, N. Y.—The United States Tire Co. has opened at 195 East avenue, a subbranch where it will conduct a wholesale business in auto tires and sundries. O. S. Johnson, Buffalo manager for this concern, has been appointed manager of the new branch here with S. N. Keller, to act as local manager. The Rochester branch will include the counties of Monroe, Ontario, Livingston, Schuyler, Chemung, Yates, Steuben and the western half of

Changes Among Dealers Stocking Up for the Season of 1913

PLEASURE CARS

Town—	Agent	Car
Newton, Ill.	Newton Motor Car Co.	Cole
Pine Bluff, Ark.	Hearn Auto Co.	Cole
Prince Albert, Can.	L. Broadfoot & A. J. Manville	Cole
Punxsutawney, Pa.	W. L. Simpson	Cole
Regina, Can.	H. A. Gordon	Cole
Somerville, N. J.	Augustus Duryea	Cole
Springfield, O.	Valentine King Garage	Cole
St. Paul, Minn.	Motor Truck Co.	Cole
Columbus, O.	Murnan Taxicab Co.	Moon
Decatur, Ill.	N. Main Street Garage	Moon
Houston, Tex.	Northrup & Clark Co.	Moon
Los Angeles, Cal.	L. C. Buxton	Moon
Memphis, Tenn.	Chickasaw Motor Car Co.	Moon
Mitchell, S. D.	Central Auto Supply Co.	Moon
Toledo, O.	Moon Sales Co.	Moon
Washington, Mo.	C. A. Krumsick	Moon
Wilkes-Barre, Pa.	Thomas W. Haines, Jr.	Moon
Youngstown, O.	Regal Sales Co.	Moon
Phoenix, Ariz.	H. G. Murphy	Little
Phoenix, Ariz.	J. C. Morrison	Hupmobile
Phoenix, Ariz.	McCondra & Hoeye	Marathon
Syracuse, N. Y.	Tweed Brothers	Pope-Hartford
Portland, Me.	Speare Auto Co.	Flanders
Worcester, Mass.	Cashman Auto Co.	Flanders
Washington, D. C.	Potomac Motor Car Co.	Woods
Wilmington, Del.	Gomery-Schwartz Automobile Co.	Ford
Carmi, Ill.	John F. Orr	Empire
Cincinnati, O.	Commercial Motor Sales Co.	Empire
Des Moines, Ia.	Cartercar Iowa Co.	Empire
Greenville, S. C.	Ellis Car Co.	Empire
Greentown, Ind.	H. F. Wagner	Empire
Kansas City, Mo.	England Brothers Motor Co.	Empire
Los Angeles, Cal.	Greer Robbins Co.	Empire
Memphis, Tenn.	McDonald Automobile Co.	Empire
St. Louis, Mo.	Johnson Automobile Co.	Empire
Shreveport, La.	C. F. Brown Auto Co.	Empire
Toledo, O.	Crist Motor Sales Co.	Empire
Wichita, Kans.	Peru Van Zandt Implement Co.	Empire
Cleveland, O.	C. J. Reeve	Empire
Corning, Ia.	Sherman Bradley	Empire
Somerset, Pa.	Somerset Automobile Co.	Empire
Carlisle, Pa.	Cumberland Valley Garage	Empire
Galion, O.	Galion Motor Car Co.	Empire
Quincy, O.	Haines Brothers	Empire
LaCarne, O.	W. S. Woodring	Empire

TRUCKS

Town—	Agent	Car
Indianapolis, Ind.	Archey-Atkins Co.	Mais
Columbus, O.	Coates Motor Co.	Federal
Nashville, Tenn.	Cumberland Motor Co.	Federal
Toronto, Ont.	McKinnon Motor Vehicle Co.	Federal
Lexington, Ky.	Blue Grass Auto Co.	Federal
Portland, Ore.	Gerlinger Motor Car Co.	Federal
Youngstown, O.	Youngstown Carriage Co.	Federal
Portsmouth, N. H.	Rockingham Garage & Machine Shop	Federal
Cambridge, Mass.	Blake Auto Co.	Atterbury
Boston, Mass.	C. B. Johnson Co.	Stewart
Boston, Mass.	C. A. Malley	Flanders
Detroit, Mich.	Thompson Auto Co.	Standard

Wayne county, including towns on the Northern Central road.

Windsor, Ont.—Russell North has opened a garage and repair shop at 295 Oulette avenue, Windsor.

Detroit, Mich.—It is announced that the Kelsey Wheel Co. will open a branch factory at Memphis, Tenn., for the manufacture of spokes and rims.

Galion, O.—The Cleveland-Galion Motor Truck Co., of Galion, has filed papers with the secretary of state increasing its capital stock from $300,000 to $1,000,000.

Winnipeg, Man.—The Breen Motor Co. has closed a contract with the Studebaker Corporation of Canada. It will have exclusive selling rights for Studebaker cars in Manitoba.

San Francisco, Cal.—The W. D. Newerf Rubber Co. has opened a San Francisco service depot at Van Ness and Golden Gate avenues. A supply of Miller tires will be kept on hand.

Dallas, Texas—Replacing Britt Webb, who is now in charge of the Buick at San Antonio, R. C. Langley is acting sales manager for the Buick company at its Dallas branch.

Vancouver, B. C.—The Tudhope Motor Car Co. is putting up a $50,000 building in Vancouver. It will cover an area of 75 by 125 feet at the corner of Fifteenth avenue and Granville street.

Boston, Mass.—Moses H. Libby, an attorney in Boston, with Roscoe G. Houston and William D. Wallace, have formed the Eliot Motor Car Co., which is capitalized under Massachusetts laws at $250,000.

Detroit, Mich.—The Detroit Seamless Steel Tubes Co. announces it is again in position to accept orders for its products for shipment after January 1, it having been practically out of business since July 1, owing to a disastrous fire.

Columbus, O.—The announcement is made that the Auto Exchange, at Park and Goodale streets, and the Columbus Auto Inn at Sixth avenue and High street, Columbus, O., have united and located at the latter place. R. C. Shisler and M. E. Bedlack are the managers of the merged concern.

Los Angeles, Cal.—The Los Angeles Alco Motor Sales Co. southern California agent for Alco cars and trucks, has established a branch in San Diego. The new branch will be known as the Alco Motor Sales Co., of San Diego, and is located at 342 Sixth street. W. H. Carlson, Jr., is manager of the branch.

Phoenix, Ariz.—Charles McArthur and George E. Morse have bought the machine shop of the Phoenix Auto Co., which they will conduct under the firm name of McArthur & Morse. They will handle the Case car, for which McArthur holds the local agency. Arthur Ainsworth, former proprietor of the Phoenix Auto Co., retains the Chalmers agency and about January 1 will open a salesroom at 310 North Central avenue, under the name of the Ainsworth Auto Co.

Dallas, Texas—H. B. Sammons is now assistant manager for the John Deere Plow Co. at the Dallas office.

Seattle, Wash.—The Motor Equipment Co., of Seattle, owned and managed by Edward J. Strelau, has been sold to Ballou & Wright, of Portland.

Victoria, British Columbia.—A new building for the Western Motor and Supply Co. is nearing completion at the corner of Vancouver and View streets, Victoria.

Corning, N. Y.—G. R. Dillon and Max Wolcott have formed a partnership and will conduct a general agency supply and repair business at Tioga avenue garage.

Dallas, Texas—M. C. Wolfe, for several years representing the Columbia, has resigned to become manager for the southwest of the Kisselkar Co. He is now located at Dallas headquarters.

Syracuse, N. Y.—Stewart F. Munroe is now affiliated with the sales department of H. A. Moyer. He was president of the James Auto Co. before that concern was taken by C. Arthur Benjamin, Inc.

New Haven, Conn.—E. J. Bartlett, formerly sales manager of the Stutz Motor Car Co., of Boston, has gone into business for himself and he has opened agencies for the Stutz cars at both New London and New Haven in Connecticut.

Cincinnati, O.—The Commercial Motor Sales Co. has been formed in Cincinnati to handle the Smith truck. G. Schorr is president; W. G. Hoelscher, vice-president and general manager; E. H. Hoescher, secretary, and W. G. Vosler, treasurer. The company has leased a building on Eighth avenue.

Buffalo, N. Y.—Claude M. Nankivel, 17 State street, New York city, has been appointed foreign distributor for Stewart delivery trucks, manufactured by the Stewart Motor Corporation, of Buffalo, N. Y. Mr. Nankivel will handle the sale of these trucks in Europe, Australia, New Zealand, South Africa and South America.

Syracuse, N. Y.—The Jefferson Garage Co., central New York distributor for National and Hupmobile pleasure cars and the International Harvester truck, has opened a new fireproof garage at 428 East Jefferson street, the Freeman block. The garage has the space for the storage of 500 cars. There are four floors and basement, with 40,000 square feet of floor space. Charles J. Roehm is in charge.

Milwaukee, Wis.—It is reported that the United States Tire Co. contemplates the establishment of a direct factory branch in Milwaukee, to serve the state of Wisconsin and possibly some additional territory. The line now is handled by the Goodyear Rubber Co., 382-384 East Water street, Milwaukee, which holds the state territory. Victor M. Stamm is sales manager of the tire department and Edward C. Dusold is traveling state agent. The report says Mr. Dusold will be made manager of the proposed factory branch here.

Lansing, Mich.—The Everitt-Metzger-Flanders Co. has decreased its capitalization from $1,000,000 to $500,000.

Detroit, Mich.—I. M. Jacobson & Sons, 408 Ford building, are operating as a company for the sale of virgin metals, and are manufacturing metal alloys for motor car manufacturers, particularly babbitt metals and all grades of solder.

Sioux City, Ia.—The Motor Mart, the new home of the Bennett Auto Supply Co., agent for Moon cars in Sioux City, was just recently completed. It includes both a service department and a salesroom.

Seattle, Wash.—W. E. Bayless, formerly Seattle manager for the Fisk Rubber Co., has been appointed to succeed the late Tom Rawlins, who died several weeks ago, as manager of the San Francisco branch.

St. Paul, Minn.—Merrit J. Osborne, 15 Ninth street east, will erect a $50,000 structure at Third street and College avenue. It will be occupied by the White line. The building is to be 91 by 150 feet and will be two stories.

Moline, Ill.—Fred R. Young is building a new garage on Sixth avenue. The building will be of brick, 45 by 150 feet in dimensions, two stories in height, to cost $20,000. The building will be known as the Plow City garage.

Detroit, Mich.—James W. Cain, formerly acting in the sales department of the Mc Cord Mfg. Co., has been appointed chief engineer of the company, with direct jurisdiction over the engineering, testing and experimental departments.

Indianapolis, Ind.—O. C. Reavell, formerly manager of the sales branch of the Diamond Rubber Co. at Kansas City has been transferred to the management of the company's Indianapolis branch. He succeeds W. H. Fauvre who has been advanced to manager of the company's Chicago sales and distributing branch.

Chicago.—H. Paulman & Co., handling the Pierce-Arrow, are ready to open their new service building at Twenty-third street and Armour avenue. No selling will be done on the premises. The building contains 26,000 square feet of floor space, has a mammoth elevator, 12 by 30 feet, capable of lifting many tons. The building has unobstructed light on all four sides. Thorough ventilation has been secured. In the repair shop, on the second floor, an unusually high roof enables smoke and gases to be carried away rapidly; the air is fresh and clean even when motors are being tested. The machine shop's equipment of special machines includes, for instance, a Heald grinder for grinding cylinders. The location of a modern service station at Twenty-third and Armour avenue is considered a great convenience to the motoring public and to owners of trucks in the downtown district. Twenty third street is a thoroughfare between Wabash avenue and Halsted

street and Armour avenue is only a few minutes from the loop.

Philadelphia, Pa.—The American Automobile Co., local agent for the American, soon will be housed in a new building at 2116-2118 Market street.

Washington, D. C.—The Diamond and Goodrich tire depots have been removed from 1319 Fourteenth street to larger quarters at 1502 Fourteenth street.

Portland, Ore.—George D. Rushmore has resigned as sales manager for Neate & McCarthy, Portland, and has been succeeded by Harry Twitchell.

Cambridge, Mass.—W. S. Sandeman, proprietor of Sandy's garage, 57 Boylston street, has doubled the floor space of his fireproof building. The garage now has a total floor space of over 7,000 square feet.

Los Angeles, Cal.—Frank G. Miner, southern California distributor of Kelly trucks, has opened headquarters at South Grand avenue, Los Angeles, where the southern Pacific coast distribution will be centralized.

Cleveland, O.—Charles P. Diebold has disposed of his interest in, and has resigned his position as president and general manager of the Diebold-Peters Co. His plans for the immediate future are rather indefinite at the present time.

Middleboro, Mass.—The Middleboro Auto Exchange, New England distributors of the McFarlan six, announces the appointment of L. H. Roberts as director of wholesale sales. Mr. Roberts resigns from a similar position with the Studebaker Boston branch.

Philadelphia, Pa.—The retail selling department of the Studebaker Corporation in Philadelphia has been transferred to the Wallace Automobile Co., which has secured new quarters at the southeast corner of Broad and Callowhill streets. The Wallace company also will maintain a service station at 206-208-210 North Twenty-first street.

Buffalo, N. Y.—After February 1 the Automobile Sales Co. will move its quarters and service station from 19 Northampton street to 1233-1235 Main street.

San Francisco, Cal.—A direct factory branch of the Federal Rubber Co. has been opened at 361-363 Golden Gate avenue, San Francisco. E. L. Retting will act as wholesale agent and Mohrig Brothers will act as retail distributors in San Francisco.

St. Paul, Minn.—S. W. Wicks is proprietor of the S. W. Wicks Motor Co., 195 West Fifth street, which has succeeded the Co-operative Auto Co. The new company has taken the agency for the Havers.

Los Angeles, Cal.—Progress is being made on the new building that is being built on Flower street, between Tenth and Eleventh streets, by Ralph Hamlin, the Franklin dealer, here. The new structure is a story and a half, with a frontage of 87 feet and is 105 feet in depth.

Milwaukee, Wis.—Roy D. Stewart formerly mechanical manager of the Milwaukee branch of the Thomas B. Jeffery Co., and more recently manager of the Walsh & Schulz garage, has resigned to become Wisconsin traveling representative of the Vacuum Oil Co.

Milwaukee, Wis.—Allen H. Small, assistant manager of the Milwaukee branch of the Buick Motor Co. for some time, has resigned to accept the position of district manager for the Oakland-Wisconsin Motor Co., state agent for the Oakland, Empire and Detroiter.

Toronto, Ontario.—The Central Garage and Supply Co., Ltd., 209 King street west, is the Ontario distributor of the Abbott-Detroit and Canadian agent for the Federal trucks. The officers of the company are R. J. Haley, president; P. G. Austin, vice-president; T. S. Blues, treasurer and general manager, and R. B. Haley, secretary.

Akron, O.—The American Tire and Rubber Co. has increased its capital from $200,000 to $500,000. The company has been established only about 7 months.

New York.—W. Krafve has joined the sales force of the H. J. Koehler S. G. Co. as traveling representative for the Koehler comercial car and the Hupmobile.

Sherbrooke, Que.—The Canadian Tire Filler Co., Ltd., has been formed. A large factory and show rooms at Sherbrooke to make this new product have been opened. The company has the sole Canadian right of Day's resilient filler.

Stoughton, Wis.—Oscar & Flon have completed their new garage building on North Water street, but it will not be completely ready until March 1. The building is 46 by 90 feet in size, two stories and basement, with a one-story addition, 26 by 35 feet.

Kentville, Nova Scotia.—The Provincial Motor Car Co., Ltd., is the name of a new company just organized and doing business, with headquarters at Kentville. The capital stock is $50,000. The agency for the Studebaker Co. has been secured for Nova Scotia for 1913.

Minneapolis, Minn.—G. E. Viehman, head of the Viehman Auto Co., agent for the Auburn Co., has returned to the Northwestern Automobile Co. as sales manager. The Northwestern has given up the Ford line to the new local factory branch and now represents the Krit.

Washington, D. C.—The Commercial Automobile and Supply Co., Studebaker agent, has leased the first floor and basement of the Pope building, formerly occupied by the Pope Automobile Co., and after extensive alterations will take possession about February 1, 1913.

Georgia Rural Financier Points Out What Motor Car Is Doing for the Farmers

SAVANNAH, Ga., Dec. 7.—An enterprising rural financier, who once owned a motor car, which he has now sold, has compiled figures tending to show that if all the owners in Georgia would dispose of their cars and put the money in the bank it would afford the banks sufficient funds to loan the farmers to meet a possible financial stringency and move the crops without having recourse to the paternal government to help by loaning money to the banks themselves.

The figures are chiefly interesting as showing what the motor car has done for Georgia. The financier overlooked the hundreds of paved roads that connect the counties in all directions, and afford the farmer an opportunity to move his crops to the railroads at a considerable saving on the wear and tear of his wagons and teams. He overlooked the comparative ease with which farming work is done by motor-driven machinery over the old system. He failed to take into consideration the vast amount of business that is done in the cities by means of the motor car.

The advent of the motor car in Georgia has established highways through the mountains to the plains, and it maintains them. It has brought the culture of the city to the country and the products of the ruralist to the town. It has given tired city people an opportunity of enjoying fresh country air and acquainted them with the beauties of nature. It has enabled the farmer to improve his lands and do much work by machinery formerly done by man. It has afforded a more rapid and economical means of transportation for the commercial man. It has increased population in cities and communities. It has built large and handsome buildings and purchased valuable lands. It has brought untold millions in revenue to the people of Georgia. It has given employment to thousands of men throughout the state. It has made a people healthier and happier by its presence.

Not the least of its accomplishments is the opportunity is has given the people of all communities to see the beauties of their neighboring communities. The motor car, as a vehicle for touring purposes, has the railroads beaten a number of ways. The tourist now, driving his own car, travels at his convenience, stopping wherever the notion strikes him, making a leisurely trip, seeing all that there is to see, getting in touch with the people. A month on the road with a good car is worth a year of travel in musty trains, where the stopping places must necessarily be the cities.

This is the season of the tourist. They are already turning their motors southward as the frost begins to nip them from behind. Georgia and Florida will be the meccas of these travelers for the next several months.

No Increase in Average Horsepower

Only Few Continental Cars Being Made with More Than 4-inch Bore, While Most Motors Are 2.7 and 2.9 Inches—Longest Stroke, 7.08, on a Hispano-Suiza Model

LIKE its London predecessor, the Paris show is one of only moderate changes and practically no startling designs. Statistics would show that the average horsepower has not shown any increase, but this is the fault of the statistics. The official European formula for calculating horsepower practically ignores stroke, and as piston strokes have been steadily increased, horsepower has gone up a little with the larger cylinder capacity. This, of course, is not brought out in the statistics; as examples of the errors into which the uninitiated may be led by the method of calculating horsepower, may be mentioned the Sizaire & Naudin, 70 by 170, which is officially of lower horsepower than the same firms 75 by 120 model; also the Hispano-Suiza's 80 by 180, which has the same rating as the firm's 80 by 110.

The average horsepower stands at 16, European rating, which is slightly in excess of that of 2 years ago. The average cylinder bore, considering four-cylinder models only, is about 80 millimeters, or 3.1 inches. Only a very small number of cars are being made with more than 4-inch cylinder bore, while a very big proportion of the French models are built with motors of 70 and 75 millimeters—2.7 and 2.9 inches.

Typical French Motors

About 50 per cent of the French makers limit the size of their motors to 80 millimeters, while, where larger types are built, they generally comprise a small proportion of the firm's total output. Delaunay-Belleville, Hotchkiss, Mercedes, Metallurgique, Lancia, Itala, Unic, Leon Bollee, Metallurgique and Minerva are the leading firms which produce a majority of their cars with motors of more than 3.1 inches bore.

The longest stroke on the practically commercial models is 180 millimeters, or 7.08 inches, on one of the Hispano-Suiza cars, the cylinder bore of which is 3.1 inches; Pipe has also 180 millimeters stroke for a bore of 100 millimeters; Sizaire & Naudin is second with 170 millimeters, or 6.69 inches, stroke for a bore of 2.7 inches. Other long strokes are Gregoire, with 80 by 160, La Buire 80 by 160, Chenard & Walcker 80 by 150, Renault 100 by 160, Brasier 100 by 150, and, most significant, Panhard with 70 by 140. There is no case in which the stroke has been reduced, but a considerable number in which it has been increased a little. Delage, for instance, has changed his four-cylinder from 75 by 120 to 75 by 130 millimeters, and his six-cylinder from 66 by 120 to 65 by 130; Piccard-Pictet has changed from 90 by 130 to 90 by 150 and 90 by 170; Bozier and Alcyon have each changed from 75 by 120 to 75 by 130. Finally, Ballot, one of the largest motor makers for the trade, has added 10 millimeters to the stroke of nearly all his motors.

For motors of 65, 70 and 70 millimeters bore it is the common practice to fit two-bearing crankshafts, the crankchamber then having no horizontal division. This

COMPARISON OF LEADING CONTINENTAL FOUR AND SIX-CYLINDER CARS AT PARIS SALON FOR 1912 AND 1913

	1912 Bore and Stroke Millimeters.	1912 Bore and Stroke Inches.	1913 Bore and Stroke Millimeters.	1913 Bore and Stroke Inches.	H P Engine R A C Rating
Adler	75x103	2.95x4.05	75x120	2.95x4.72	13.9
	85x115	3.34x4.52	80x130	3.14x5.11	15.8
	90x125	3.54x4.92	92x148	3.62x5.82	21.0
	105x140	4.13x5.51	114x160	4.48x6.29	32.0
	115x140	4.52x5.51	123x160	4.92x6.29	36.9
Alcyon	75x120	2.95x4.72	75x130	2.95x5.11	13.9
	90x130	3.14x5.11	No change	No change	15.8
Aries	60x100	2.36x3.93	No change	No change	10.1
	65x100	2.55x3.93	No change	No change	10.5
	75x140	2.95x5.51	No change	No change	13.9
	84x130	3.30x5.11	No change	No change	17.5
	105x160	4.13x6.29	No change	No change	27.3
Austro-Daimler	80x110	3.14x4.33	No change	No change	15.9
	.....		90x140	3.54x5.51	20.1
	105x150	4.13x5.11	No change	No change	27.3
	120x157	4.72x6.18	120x154	4.72x6.06	33.7
	105x165	4.13x6.49	No change	No change	27.3
Barre	65x110	2.55x4.33	65x110	2.55x4.33	10.5
	75x120	2.95x4.72	Not made	Not made	
	75x130	2.95x5.11	No change	No change	13.9
Buzelaire	75x100	2.95x3.93	No change	No change	13.9
	76x120	2.99x4.72	No change	No change	14.4
	84x130	3.30x5.11	No change	No change	17.7
Benz	72x120	2.83x4.72	No change	No change	13.5
	80x130	3.14x5.11	No change	No change	15.6
	90x140	3.54x5.51	No change	No change	20.1
	.....		95x140	3.74x5.51	23.4
	125x150	4.92x5.90	No change	No change	40.9
	.....		130x160	5.11x6.29	42.1
	.....		185x200	7.28x7.87	84.7
Berliet	70x100	2.75x3.93	No change	No change	12.1
	80x120	3.14x4.72	No change	No change	15.6
	.....		90x140	3.54x5.51	20.1
	100x140	3.93x5.51	No change	No change	26.5
	120x140	4.72x5.51	No change	No change	33.7
Bianchi	90x115	3.54x4.52	No change	No change	20.1
			100x140	3.93x5.51	26.8
	110x150	4.33x5.90	No change	No change	30.0
	.....		130x160	5.11x6.29	42.9
	.....		130x150	5.11x5.90	42.9
Bollee, Leon	83x110	3.26x4.33	No change	No change	14.9
	95x130	3.74x5.11	Not made	Not made	
	98x130	3.85x5.11	Not made	Not made	
	108x130	4.17x5.11	Not made	Not made	
	125x150	4.92x5.90	Not made	Not made	
	130x150	5.11x5.90	Not made	Not made	
Bozier	67x110	2.63x4.33	Not made	Not made	
	65x130	2.55x5.11	No change	No change	13.9
	75x120	2.95x4.72	75x120	2.95x5.11	13.9
	75x150	2.95x5.90	No change	No change	11.1
Brasier	67x110	2.63x4.33	No change	No change	12.1
	70x120	2.75x4.72	No change	No change	
	80x130	3.14x5.11	Not made	Not made	
	85x140	3.34x5.51	No change	No change	17.5
	90x140	3.54x5.51	Not made	Not made	
	100x150	3.93x5.90	No change	No change	24.4
Buchet	76x120	2.99x4.72	76x120	2.99x4.72	14.1
Buire, La	.....		65x130	2.55x5.11	10.5
	70x150	2.75x5.90	No change	No change	12.1
	75x130	2.95x5.11	Not made	Not made	
	80x160	3.14x6.29	No change	No change	15.9
	85x140	3.34x5.51	No change	No change	18.4
	90x140	3.54x5.51	Not made	Not made	
	90x160	3.54x6.29	No change	No change	20.1
	105x150	4.13x5.90	Not made	Not made	
Charron	65x120	2.55x4.72	No change	No change	10.5
	80x120	3.14x4.72	No change	No change	17.5
	95x130	3.74x5.11	No change	No change	27.4
	110x150	4.33x5.90	No change	No change	36.0
Chenard & Walcker	65x120	2.55x4.72	70x130	2.75x5.11	12.1
	75x120	2.95x4.72	75x150	2.95x5.90	13.9
	80x150	3.14x5.90	No change	No change	15.6
C. L. D. (non-poppet)	75x120	2.95x4.72	No change	No change	
C. L. C. (non poppet) (4 cyl.)	80x140	3.14x5.51	No change	No change	15.6
Clement-Bayard	60x120	2.36x4.72	No change	No change	10.1
	.....		65x120	2.55x4.72	10.5
	70x110	2.75x4.33	75x110	2.95x4.33	13.9
	80x120	3.14x4.72	80x130	3.14x5.11	15.6
	.....		85x140	3.34x5.51	17.5
	.....		*90x150	3.54x5.11	20.1
	100x140	3.93x5.51	Not made	Not made	
	.....		*100x140	3.93x5.51	26.8
Corre La Licorne	70x120	2.75x4.72	75x120	2.95x4.72	13.9
	65x130	2.55x5.11	No change	No change	
	75x150	2.95x5.90	No change	No change	
	80x140	3.14x5.51	Not made	Not made	
	100x140	3.93x5.51	Not made	Not made	
Cote (two cycle)	65x 85	2.55x3.34	Not made	Not made	13.9
	75x105	2.95x4.13	75x120	2.95x4.72	15.6
	80x105	3.14x4.13	80x120	3.14x4.72	17.1
	90x120	3.54x4.72	No change	No change	20.1
	100x120	3.93x4.72	No change	No change	

*Knight

Six-Cylinders Show No Gain in Numbers

Improvement in Flexibility of the Four and Increasing Cost of Fuel Are Important Factors Against Further Extension of the Six—Trend Is Toward Monoblock Types

method is adopted by Unic, Ballot, Chapuis & Dornier, Sizaire & Naudin, Delahaye, Chenard & Walcker, de Dion Bouton, D. F. P., and Pilain. Delage, after using two bearings for his 75 millimeters motor has adopted three for the coming season, and all the firms mentioned above adopt three main bearings whenever their motors exceed 75 millimeters bore. Panhard, it may be mentioned, has decided on three bearings for the new 70 by 140 millimeters type just put on the market.

The disadvantages of two-bearing crankshafts outweigh the advantages when the size of the cylinders gets beyond 75 millimeters, and among the firms mentioned there are some who have had to redesign their motors with a stiffer shaft and longer bearings to get rid of the suspicion of whip when running heavily loaded.

Six-cylinder motors are not on the increase. Delaunay-Belleville makes a specialty of this type of motor and is one of the few firms building more sixes than fours. There are about half a dozen firms having abandoned some or all of their six-cylinder models, among these being some factories never having built more than a very small number of sixes, and there are about three firms bringing out a six for the first time. Improvements in the flexibility of the four and the increasing cost of fuel are important factors against the further extension of the six-cylinder motor.

COMPARISON OF LEADING CONTINENTAL FOUR AND SIX-CYLINDER CARS AT PARIS SALON FOR 1912 AND 1913

	1912 Bore and Stroke Millimeters.	1912 Bore and Stroke Inches.	1913 Bore and Stroke Millimeters.	1913 Bore and Stroke Inches	H. P. English R. A. C. Rating.
Cottin & Desgouttes	70x120	2.75x4.72	Not made	Not made	....
	80x160	3.14x6.29	No change	No change	15.8
	100x140	3.93x5.51	100x160	3.93x6.29	24.8
	120x160	4.72x6.29	No change	No change	35.7
	130x200	5.11x7.87	No change	No change	42.0
Crespelle	65x110	2.55x4.33	Not made	Not made	....
	65x130	2.55x5.11	No change	No change	10.8
	75x120	2.95x4.72	No change	No change	13.9
	75x150	2.95x5.90	No change	No change	13.9
	85x160	3.34x6.29	Not made	Not made	....
Darracq	68x120	2.67x4.72	Not made	Not made	....
	75x120	2.95x4.72	†75x120	2.95x4.72	13.9
	80x120	3.14x4.72	Not made	Not made	....
	100x140	3.93x5.51	No change	No change	....
	.....	.....	†85x130	3.34x5.11	17.9
	95x140	3.74x5.51	Not made	Not made	....
	80x130	3.14x5.11	Not made	Not made	....
Delage	62x110	2.44x4.33	Not made	Not made	....
	65x110	2.55x4.33	No change	No change	10.5
	75x120	2.95x4.72	75x130	2.95x5.11	13.9
	80x140	3.14x5.86	Not made	Not made	....
Delahaye	62x100	2.44x3.93	No change	No change	9.1
	75x110	2.95x4.33	No change	No change	13.9
	85x130	3.34x5.11	No change	No change	17.9
	95x130	3.74x5.11	No change	No change	22.4
Delaunay-Belleville	85x130	3.34x5.11	No change	No change	18.5
	100x140	3.93x5.51	No change	No change	24.8
De Dion Bouton—2 cyl.	66x120	2.59x4.72	No change	No change	5.4
1 cyl.	84x130	3.30x5.11	Not made	Not made	..
2 cyl.	75x130	2.95x5.11	Not made	Not made	....
	66x120	2.59x4.72	No change	No change	10.8
	70x130	2.75x5.11	75x130	2.95x5.11	13.9
	80x140	3.14x5.51	No change	No change	15.8
	100x140	3.93x5.51	No change	No change	24.8
D. F. P.	65x120	2.55x4.72	No change	No change	10.5
	70x130	2.75x5.11	No change	No change	12.1
	80x150	3.14x5.90	No change	No change	15.8
Excelsior	85x130	3.34x5.11	No change	No change	17.9
F. I.	80x100	3.14x3.93	No change	No change	15.8
F. N.	74x 90	2.91x3.54	69x130	2.71x5.11	11.8
	80x120	3.14x4.72	83x120	3.34x4.72	17.9
	125x140	4.92x5.51	Not made	Not made	....
Fiat	70x120	2.75x4.72	No change	No change	12.1
	80x130	3.14x5.11	80x140	3.14x5.51	15.8
	100x140	3.93x5.51	No change	No change	24.8
	110x150	4.33x5.90	No change	No change	30.0
	130x170	5.11x6.69	Not made	Not made	....
	130x190	5.11x7.48	Not made	Not made	....
Germain	86x110	3.38x4.33	*No change	No change	18.4
	92x110	3.62x4.33	No change	No change	21.0
	80x130	3.14x5.11	No change	No change	15.8
	102x110	4.01x4.33	No change	No change	25.8
	120x130	4.72x5.11	No change	No change	35.7
Gobron	70x150	2.75x5.90	No change	No change	13.9
	.....	.....	80x160	3.14x6.29	15.8
	90x180	3.54x7.08	No change	No change	20.1
	110x250	4.33x9.84	No change	No change	30.0
Gregoire (2 cycle)	80x110	3.14x4.33	Not made	Not made	....
(1 cycle)	.....	.....	†100x170	3.93x6.69	6.2
	.....	.....	65x130	2.55x5.11	10.5
	80x110	3.14x4.33	No change	No change	15.8
	.....	.....	*80x130	3.14x5.11	15.8
	80x160	3.14x6.29	No change	No change	15.8
Hispano-Suiza	80x110	3.14x4.33	No change	No change	15.8
	80x130	3.14x5.11	No change	No change	15.8
	80x180	3.14x7.08	No change	No change	15.8
Hotchkiss	80x120	3.14x4.72	No change	No change	15.8
	95x130	3.74x5.11	No change	No change	22.4
	110x150	4.33x5.90	No change	No change	30.0
Hurtu	70x100	2.75x3.93	70x110	2.75x4.33	12.1
	80x110	3.14x4.33	75x120	2.95x4.72	13.9
	90x120	3.54x4.72	Not made	Not made	....
	105x130	4.13x5.11	Not made	Not made	....
Isotta-Fraschini	74x130	2.91x5.11	75x130	2.95x5.11	13.9
	85x130	3.34x5.11	No change	No change	17.9
	.....	.....	100x140	3.93x5.51	24.8
	110x160	4.33x6.29	No change	No change	30.0
	105x180	4.13x7.08	No change	No change	27.3
	.....	.....	130x200	5.11x7.87	42.0
Itala	75x110	2.95x4.33	Not made	Not made	....
	77x120	3.03x4.72	No change	No change	14.7
	90x130	3.54x5.11	No change	No change	20.1
	115x130	4.52x5.11	No change	No change	32.8
	†90x130	3.54x5.11	†No change	No change	20.1
Itala	130x140	5.11x5.51	Not made	Not made	....
	105x150	4.13x5.90	No change	No change	27.3
	140x150	5.51x5.90	No change	No change	48.6
	127x160	5.00x6.29	No change	No change	39.9

* Knight.
† Non-poppet.

Although far from being in the majority, there is a pronounced tendency towards the adoption of unit construction for motor and gearbox. Panhard took this up a year ago and has extended it to all the models; D. F. P. has adopted it for the coming season; Gregoire has one model with the clutch and gearset united; F. L. has a power plant of this type; Hispano-Suiza and Piccard-Pictet have adopted this construction from the beginning; Motobloc, generally admitted to be the originator of this method, continues it; La Buire has adopted it, and it is very much favored by the Italian firms, Scap, Scat, etc. De Dion-Bouton makes use of it on some of the smaller models.

Although not likely to oust separate construction in the near future, the unit idea has made real progress. There are two distinct methods of treating the unit type. In the minority is the Hispano-Suiza school, where the unit is rigidly bolted to the frame or to inswept extensions of the frame so as to stiffen the entire construction, and in the majority of cases the unit is hung on three points.

The tendency is more and more towards monoblock motors, some of the four-cylinder castings being enormous pieces. Berliet, for instance, has cylinders of 100 by 140 cast together; Gregoire has changed from pair casting to block; Delage casts cylinders of 65 by 130 together; La Buire has single castings up to 90 by 160. Practically all motors up to 85 bore are in one casting, above this size opinions are di-

vided, the majority favoring pair casting. Single casting is practically unknown except by some of the firms using the Knight motor in big sizes.

Silent-chain drive for cam and magneto shafts has made enormous progress. It would perhaps be easier to give the names of the firms not using it than those having adopted it. The former list would include some important firms, for it is precisely those factories having such a reputation that they can afford to be conservative, which have remained true to meshing pinions. Panhard, usually classed with the conservative school, has made use of a chain for the poppet-valve models, after having had lengthy experience with it on the Knight motors. Sizaire Naudin, after using it on one model, has extended it to all. Chenard-Walcker uses it throughout the series, from the small four to the big six. The use of one or two chains and the provision for adjustment or not are debatable points. The majority appear to have made use of a single chain on three points, one of these, the magneto shaft, being adjustable.

It is the method adopted by Chenard-Walcker, where the magneto platform has a transverse adjustment to take up the slack of the chain. The same idea is used by Ballot on most of his motors. Delage, on the other hand, prefers the use of two chains—crankshaft to camshaft and camshaft to magneto shaft, without adjustment. The main feature is that after a couple of years' experience chains have not given trouble, are being continued by those having tried them, and taken up by others.

Thermo-Syphon Cooling

Thermo-syphon cooling is in a majority if the exhibition as a whole is considered. But if the cars are separated into classes it will be found that pump and natural flow are about equally divided for the more powerful motors. Hotchkiss, Delaunay Belleville, Panhard, Unic, Peugeot retain the pump for all their models, or, at any rate, for all those of more than moderate power. The claim is no longer made that natural circulation is inefficient under strenuous conditions, but the claim is made that for very big motors the quantity of water that must be carried outweighs the advantage of abolishing one supplementary organ. Renault and Charron still head the list of firms making use of thermo-syphon for the whole series of motors.

There can only be one opinion regarding ignition. A single high tension magneto, with fixed advance in the small powers and variable advance for the larger models, is found on at least 95 per cent of the cars in the show. Storage batteries for ignition purposes are as dead as the dodo. Even the attempts to popularize a double ignition with one set of plugs, as brought out by both Bosch and Eisemann a couple of years ago, has failed to find favor. In most cases this was fitted with

COMPARISON OF LEADING CONTINENTAL FOUR AND SIX-CYLINDER CARS AT PARIS SALON FOR 1912 AND 1913

	1912 Bore and Stroke Millimeters	1912 Bore and Stroke Inches	1913 Bore and Stroke Millimeters	1913 Bore and Stroke Inches	H. P. English R. A. C. Rating
Lancia	100x120	3.93x5.11	No change	No change	24.8
Lorraine-Dietrich	75x120	2.95x4.72	No change	No change	13.9
	90x130	3.54x5.11	No change	No change	20.1
	110x150	4.33x5.90	Not made	Not made	
	125x160	4.92x6.29	125x170	4.92x6.69	34.8
Martini	80x120	3.14x4.72	No change	No change	15.8
	90x140	3.54x5.51	No change	No change	20.1
	110x140	4.33x5.51	Not made	Not made	
	125x140	4.92x5.51	Not made	Not made	
	.....	.....	90x140	3.54x5.51	20.1
Mercedes	70x120	2.75x4.72	No change	No change	12.1
	80x130	3.14x5.11	No change	No change	15.8
	90x140	3.54x5.51	No change	No change	20.1
	110x150	4.33x5.90	No change	No change	30.0
	*110x150	4.33x5.11	No change	No change	24.8
	120x160	4.72x6.29	No change	No change	35.7
	140x160	5.51x6.29	No change	No change	46.6
	130x180	5.11x7.08	No change	No change	42.5
Mercedes-Simplex	.....	.....	75x96	2.95x3.77	13.9
	80x130	3.14x5.11	No change	No change	15.8
	90x140	3.54x5.51	No change	No change	20.1
	102x150	4.01x5.90	No change	No change	23.5
	125x150	4.92x5.90	No change	No change	28.5
Metallurgique	*82x110	3.22x4.33	75x120	2.95x4.72	13.9
	102x125	4.01x4.92	Not made	Not made	
	124x130	4.88x5.11	Not made	Not made	
	*80x125	3.14x4.92	80x130	3.54x5.11	20.1
	*100x140	3.93x5.51	No change	No change	24.8
	*124x150	4.88x5.90	No change	No change	34.2
Mors	75x120	2.95x4.72	No change	No change	13.9
	80x120	3.14x4.72	85x150	3.34x5.90	17.9
	100x140	3.93x5.51	Not made	Not made	
	.....	.....	75x120	2.95x4.72	13.9
	.....	.....	90x130	3.54x5.11	20.1
	.....	.....	100x140	3.93x5.51	24.8
	.....	.....	124x150	4.88x5.90	38.2
Motobloc	65x120	2.55x4.72	No change	No change	10.5
	80x120	3.14x4.72	No change	No change	15.8
	80x148	3.14x5.82	No change	No change	15.8
	90x130	3.54x5.11	No change	No change	20.1
	90x160	3.54x6.29	No change	No change	20.1
	100x140	3.93x5.51	Not made	Not made	
N. A. G.	.....	.....	*75x 85	2.95x3.34	13.9
	.....	.....	*75x118	2.95x4.64	13.9
	.....	.....	*83x120	3.26x4.72	14.9
	.....	.....	*90x130	3.54x5.11	20.1
	.....	.....	*115x125	4.52x4.92	32.4
	.....	.....	*130x160	5.11x6.29	42.1
Nagent Freres	70x118	2.75x4.64	75x118	2.95x4.64	13.9
	90x120	3.54x4.72	83x120	3.26x4.72	[illegible]
	90x130	3.54x5.11	No change	No change	[illegible]
	106x130	4.17x5.11	115x125	4.52x4.92	32.4
	106x150	4.17x5.90	130x160	5.11x6.29	42.1
Nazzaro	100x140	3.93x5.51	No change	No change	24.8
Opel	65x 95	2.55x3.74	65x98	2.55x3.85	10.5
	70x100	2.75x3.93	No change	No change	12.1
	75x115	2.95x4.52	No change	No change	13.9
	.....	.....	70x135	2.75x5.31	12.1
	.....	.....	84x118	3.30x4.64	17.7
	.....	.....	90x130	3.54x5.11	20.1
	.....	.....	105x135	4.13x5.31	27.3
	115x150	4.52x5.90	No change	No change	32.4
	.....	.....	120x144	4.72x5.66	37.2
	130x165	5.11x6.49	No change	No change	42.1
Panhard-Levassor (2 cylinder)	80x120	3.14x4.72	Not made	Not made	
	.....	.....	70x140	2.75x5.51	12.1
	80x120	3.14x4.72	No change	No change	15.8
	.....	.....	*80x130	3.14x5.11	
	90x130	3.54x5.11	Not made	Not made	
	100x130	3.93x5.11	*100x140	3.93x5.51	24.8
Peugeot	.....	.....	55x90	2.16x3.54	11.3
	70x130	2.75x5.11	68x130	2.67x5.11	15.8
	80x130	3.14x5.11	No change	No change	15.8
	.....	.....	80x140	3.14x5.51	20.1
	90x150	3.54x5.90	No change	No change	23.5
	92x150	3.62x5.90	No change	No change	23.4
	.....	.....	95x160	3.74x6.29	24.8
	100x160	3.93x6.29	No change	No change	
	110x160	4.33x6.29	Not made	Not made	33.7
	.....	.....	120x200	4.72x7.87	13.9
Picard Pictet	80x120	3.14x4.72	No change	No change	15.8
	.....	.....	80x140	3.14x5.51	20.1
	90x130	3.54x5.11	90x150	3.54x5.90	20.1
	.....	.....	90x170	3.54x6.69	24.8
	100x140	3.93x5.51	100x150	3.93x5.90	19.3
Pilain	65x120	2.55x4.72	No change	No change	[illegible]
	.....	.....	55x110	2.16x4.33	13.9
	75x110	2.95x4.33	No change	No change	20.1
	90x120	3.54x4.72	No change	No change	17.9
	.....	.....	85x185	3.34x7.28	24.8
	100x120	3.93x4.72	100x140	3.93x5.51	38.2
	124x140	4.88x5.51	No change	No change	31.9
Pipe	75x110	2.95x4.33	No change	No change	15.8
	80x150	3.14x5.90	No change	No change	24.8
	100x180	3.93x7.08	No change	No change	
	90x105	3.54x4.13	Not made	Not made	
	140x180	5.51x7.08	No change	No change	46.6
Renault	70x110	2.75x4.33			
	80x120	3.14x4.72			
	90x140	3.54x5.51			
	100x160	3.93x6.29			
	130x160	5.11x6.29			
Rolland-Pilain	70x110	2.75x4.33			
	80x110	3.14x4.33			
	80x140	3.14x5.51			
	85x140	3.34x5.51			
	105x130	4.13x5.90			
	110x165	4.33x6.49			
	130x165	5.11x6.49			
	130x270	5.11x10.63			

* Knight
† Non poppet

COMPARISON OF LEADING CONTINENTAL FOUR AND SIX-CYLINDER CARS AT PARIS SALON FOR 1912 AND 1913

	1912 Bore and Stroke Millimeters	1912 Bore and Stroke Inches	1913 Bore and Stroke Millimeters	1913 Bore and Stroke Inches	H. P. English R. A. C. Rating
Rossel	65x130	2.55x5.11	No change	No change	10.5
	75x150	2.95x5.90	No change	No change	13.9
	90x110	3.54x4.33	No change	No change	20.1
	80x110	3.14x4.33	No change	No change	15.8
Georges Roy	80x120	3.14x4.72	80x130	3.14x5.11	15.8
	90x140	3.54x5.51	No change	No change	20.1
Saxa	70x110	2.75x4.33	Not made	Not made	...
	75x140	2.95x5.51	No change	No change	13.9
	80x140	3.14x5.51	82x140	3.22x5.51	16.6
	...	...	100x160	3.93x6.29	24.8
Sear	60x140	2.71x5.51	Not made	Not made	...
	80x140	3.14x5.51	No change	No change	15.8
Scat	85x130	3.34x5.11	No change	No change	17.9
	102x140	4.01x5.51	No change	No change	25.8
Schneider	70x120	2.75x4.72	No change	No change	12.1
	...	...	75x130	2.95x5.11	13.9
	80x130	3.14x5.11	80x140	3.14x5.51	15.8
	95x120	3.74x5.11	95x150	3.74x5.90	22.4
	105x150	4.13x5.90	110x160	4.33x6.29	30.0
Simca-Nardin (Level)	120x140	4.72x5.51	Not made	Not made	....
	70x170	2.75x6.69	No change	No change	12.1
	...	...	65x110	2.55x4.33	10.5
	...	...	75x120	2.95x4.72	13.9
Spa	70x120	2.75x4.72	No change	No change	12.1
	85x120	3.34x4.72	No change	No change	17.9
	100x140	3.93x5.51	No change	No change	24.8
	130x145	5.11x5.70	110x200	4.33x7.87	20.0
Sizaire	70x110	2.75x4.33	75x120	2.95x4.72	13.9
	80x110	3.14x4.33	No change	No change	15.8
	80x140	3.14x5.51	No change	No change	15.8
Turcat-Mery	80x130	3.14x5.11	No change	No change	15.8
	90x130	3.54x5.11	No change	No change	20.1
	100x130	3.93x5.11	No change	No change	24.8
	...	...	110x160	4.33x2.69	30.0
Vinot	75x120	2.95x4.72	65x110	2.55x4.33	10.5
	90x120	3.54x4.72	No change	No change	13.9
	102x116	4.01x4.56	90x130	3.54x5.11	20.1
Vermorel	...	...	Not made	Not made	...
	74x120	2.91x4.72	60x120	2.36x4.72	10.5
	90x130	3.54x5.11	No change	No change	13.4
Voisin	70x110	2.75x4.33	No change	No change	20.1
	80x110	3.14x4.33	No change	No change	12.1
	102x130	4.01x5.11	80x130	3.14x5.11	15.8
Vuillaume	80x120	3.14x4.72	101x130	3.97x5.11	25.2
	90x130	3.54x5.11	No change	No change	15.8
Zedel	68x120	2.67x4.72	No change	No change	15.8
	70x100	1.96x3.93	50x100	1.96x3.93	6.2
Zedel	68x120	2.67x4.72	70x100	No change	6.2
	72x120	2.83x4.72	No change	No change	11.3
	82x120	3.22x4.72	No change	No change	12.8
	90x140	3.54x5.51	Not made	Not made	...
			No change	No change	20.1

COMPARISON OF CONTINENTAL SIX AND EIGHT-CYLINDER CARS AT PARIS SALON FOR 1912 AND 1913

SIX-CYLINDER CARS					
Aries	60x100	2.36x3.93	No change	No change	15.0
	75x120	2.95x4.72	No change	No change	20.9
Bazelaire	75x110	2.95x4.33	75x120	2.95x4.72	20.9
Bellon	83x110	3.26x4.33	No change	No change	25.6
	100x130	4.17x5.11	Not made	Not made	...
	130x150	5.11x5.90	Not made	Not made	...
Berliet	90x140	3.54x5.51	No change	No change	30.2
	112x130	4.40x5.11	Not made	Not made	
Bugatti	85x140	3.34x5.51	No change	No change	26.4
	90x140	3.54x5.51	No change	No change	30.2
Chenard	80x120	3.14x4.72	No change	No change	24.4
	95x130	3.74x5.11	No change	No change	33.6
Clément & Wonder	80x150	3.14x5.90	No change	No change	23.8
	...	...	70x110	2.75x4.33	18.2
	80x120	3.14x4.72	No change	No change	24.4
	100x140	3.93x5.51	No change	No change	37.2
Delahaye	85x120	3.34x4.72	Not made	Not made	....
	100x140	3.93x5.51	Not made	Not made	....
Delage	60x125	2.36x4.92	65x130	2.55x5.11	15.7
Delaunay-Belleville	75x120	2.95x4.72	No change	No change	20.0
	72x120	2.83x4.72	No change	No change	18.8
	85x130	3.34x5.11	No change	No change	26.2
	100x140	3.93x5.51	No change	No change	37.2
D. F. P.	80x130	3.14x5.11	Not made	Not made	....
Excelsior	85x130	3.34x5.11	No change	No change	26.8
J. [illegible]	80x100	3.14x3.93	No change	No change	24.3
Fiat	80x130	3.14x5.11	No change	No change	24.3
Gregoire	80x120	3.14x4.72	Not made	Not made	...
Hotchkiss	95x110	3.74x4.33	Not made	Not made	....
	95x130		No change	No change	[illegible]
Itala	130x140m	5.11x5.51	Not made	Not made	....
Mercedes	120x160	4.72x5.90	No change	No change	58.5
Mors	.....	.....	85x150	3.34x5.90	26.2
Motobloc	80x120	3.14x4.72	Not made	Not made	....
	80x148	3.14x5.82	Not made	Not made	....
Panhard Levassor	90x130	3.54x5.11	Not made	Not made	....
	100x140	3.93x5.51	*No change	No change	37.2
Pilain	65x120	2.55x4.72	No change	No change	15.7
Pipe	90x140	3.54x5.51	Not made	Not made	....
	105x123	4.13x4.84	Not made	Not made	....
Renault	80x140	3.14x5.51	No change	No change	24.3
	100x160	3.93x6.29	No change	No change	37.2
Roy, Georges	80x120	3.14x4.72	No change	No change	24.3
Schneider	75x120	2.95x4.72	75x130	2.95x5.11	[illegible]
Spa	95x120	3.74x4.72	Not made	Not made	....
	130x145	5.11x5.70	Not made	Not made	....
EIGHT-CYLINDER CARS					
De Dion-Bouton	70x130	2.75x5.11	75x130	2.95x5.11	27.8
	90x140	3.54x5.51	94x140	3.70x5.51	44.0

* Knight

a view to starting up on the switch, but results were so uncertain, some motors starting well and other equally good makes refusing to start except under most favorable circumstances, that it was usually not considered worth while to keep a battery in service.

It should be borne in mind that European motors as a rule are of comparatively small size, and the cranking of them does not present any great difficulty. Both magneto and carbureter manufacturers have made it their business to build appliances which make for easy starting, and as to the possibility of a breakdown, the average European motorist looks upon his magneto as the most reliable piece of mechanism on the car. Automatic advancing magnetos have not made much progress. Fixed point ignition is in the majority, but this is merely because of a desire to make the car fool proof. In the higher grade cars, generally handled by skilled men, it is the custom to fit variable advance.

NEW WASHINGTON SHOW ANGLE

Washington, D. C., Dec. 14—The motor car show proposition took a new angle this week when a number of the dealers met and organized and incorporated the Automobile Dealers' Association of Washington, the primary object of which will be to promote the show scheduled for February 3-8. The new organization will have complete control of the show. T. Oliver Probey was elected chairman of the show committee; C. W. Semmes, vice chairman; E. A. Garlock, secretary; F. C. Sibbald, treasurer; governors, Arthur Foraker, J. H. Miller, F. W. Robartes, I. J. Henderson, J. H. Earle, T. Lamar Jackson, Bruce Emerson.

The officers of the dealers' association for the first year will be as follows: President, T. Oliver Probey; vice-president, Charles W. Semmes; secretary, E. A. Garlock; treasurer, F. C. Sibbald. The board of directors will consist of Arthur Foraker, J. H. Miller, I. J. Henderson, J. H. Earle, and Bruce Emerson.

The interesting fact in connection with the above is that all the dealers named are comparatively new in the trade and opposing them in the show proposition are dealers who are known as the old guard.

CHAPIN BOARD OF TRADE SECRETARY

New York, Dec. 16—Roy D. Chapin, of the Hudson Motor Car Co., has been elected secretary of the Automobile Board of Trade, vice Benjamin Briscoe, resigned. John North Willys, of the Willys-Overland Co., has been chosen to the vacancy in the board of directors caused by the election of Mr. Chapin and the resignation of Mr. Briscoe.

The annual meeting of the Automobile Board of Trade is scheduled for next month when a full list of officers will be chosen. The present election was to fill out the unexpired term of Mr. Briscoe.

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Controlling Traffic

CHICAGO is putting into practice a reform in the handling of its traffic in the congested business district inside the loop—the controlling of pedestrians by means of whistles blown by the crossing policemen. For a couple of years vehicles operating inside the loop have been handled in this manner, the ebb and flow of traffic being controlled by the shrill blasts as if the drivers were automatons. Now the education of the pedestrian has been started, with the same object in view—facilitating the progress of both foot passengers and vehicles. Time is money in the business districts of big cities and a short cut to this kind of wealth is by means of traffic control.

THE police of Chicago have tried only one four corners as yet—Madison and State streets, possibly the busiest spot in the western metropolis. The control of pedestrians is attempted only during the noon hour, but so far the attempt has worked out well, although the people on foot hardly can understand why it is not perfectly proper to dash in between teams and slow the vehicular traffic as they used to do.

KANSAS CITY has a similar rule which it has been enforcing for some time, but Chicago is the first of the really big cities to attempt anything of the sort. It's a different proposition altogether from the one that faces Kansas City, so New York, Philadelphia, Boston and others will have to wait until Chicago threshes out its problem.

THE business world can thank the motor car for this, for it was not until the power-propelled vehicle became so common on the city streets that the authorities realized just how much time was being wasted by everyone in getting around. Then came the systematizing of the problem. Speed was demanded, but it is only by handling traffic in a systematic manner that this speed can be attained.

IT may be said that the era of standardization of traffic control is almost here. New York has gained a flying start and in the eastern metropolis the drivers have learned their lesson so well that the whistle has been abandoned. Now the uplifted hand of the bluecoat is all-powerful. Drivers know that to ignore that uplifted hand means swift and sure punishment and they obey. When the pedestrians have been taught the same lesson, then New York will have solved the traffic problem.

THE ideal conditions that seem to await in the near future will see every one working for the common good. The policeman on the crossing will be the pendulum that swings the crowd. When he holds up his hand pedestrians and drivers going north or south will halt in order that their fellows going east and west may have right of way. There will be no dodging pedestrians in the way.

The French Aggression

MOTOR AGE this week in its first story of the Paris salon coming direct from its Paris correspondent again reiterates the one prominent fact, namely, that the foreigner has nearly run away from us in the matter of design. France has spoken on the long-stroke type of motor, not the extreme type of 2 or 3 years ago, but the rational type, a type evolved from wide experience in contests and much wider experience in touring work. In unmistakable terms the French maker has announced his stand: Fifty per cent of the motor models on view in Paris at present are in the 1.5 to 1 stroke-bore ratio class, in other words these motors have a stroke which is one-half longer than the bore. But the French maker has gone further and has thirty-three makers who have models with a 2 to 1 stroke-bore ratio, in other words the stroke is exactly twice the bore.

IN the early days of the long-stroke motor abroad, the newer concerns took up the burden of exploitation and the older concerns displayed that reluctance which characterizes some of the oldest American concerns. But the new blood won out. It demonstrated conclusively that the long-stroke motor has merits, that it has economy and that whereas it disclosed shortcomings in its pioneer days, these have been eliminated by the present generation of designers who have been studying the proposition.

TODAY the conservative French maker has come out for the long stroke motor. One of the oldest houses, a firm known from the inception of the motor industry as a firm of conservatism, has brought out a new motor with 2 to 1 ratio. It has had this motor in the hands of testers for over a year. Every detail has been thoroughly established, and the product goes on the market as a known quantity and not a conjecture.

EUROPEAN engineers have demonstrated to their entire satisfaction that one set of ignition is sufficient and that where two sets are fitted it either means that the company has not confidence in its equipment or does not know that one set is enough. The single magneto has demonstrated during the last 2 years that it is sufficiently reliable to meet all exigencies; and where other systems are used they should be brought to that point of reliability where an auxiliary system is needless. One ignition system is the watchword of Europe today and it should be the slogan of every American buyer. Why two? They are not needed.

EUROPE has also spoken in the matter of body styles. Not a few of our American builders announce with apparent pride that they do not need to make body changes, and content themselves. If they are sufficiently fortunate to keep the buyer satisfied with the present, it is an excellent commendation of their selling ability, but the fact still stands that the average body of today is a two-part affair—a hood or bonnet and a body part. The same hood serves for a runabout, a touring model, a town cab or limousine. There has not been any effort to develop a design which begins with the radiator and ends in the baggage rack. France is striving for this new ideal—a body that is a unit design, a body intended to be the most pleasing to the eye, the most comfortable to the tourists and the lightest. Others are striving valiantly to eliminate dust by underpan designs and general body lines, and they are credited with meeting with considerable success in their efforts to bring this about.

Stoddard Loses Its Knight License

CHICAGO, Dec. 17—Formal notice of the cancellation of the license of the Dayton Motor Car Co., of Dayton, O., maker of the Stoddard-Dayton, to manufacture the Silent Knight motor was mailed the receivers of the United States Motor Co., in New York today by L. B. Kilbourne, vice-president of the Knight & Kilbourne Patents Co., holder of the patents. This step was taken in accordance with a clause in the contract which gives to the holders of the patents the right to cancel any license when the concern to which the license has been granted has become involved in litigation.

This cancellation does not necessarily mean the Knight engine can no longer be used by the Stoddard-Dayton people. They can continue to use the sleeve-valve but they must buy the motors from some other concern which is licensed to manufacture them. This also applies to the Columbia. It had been generally supposed that the Columbia company also was a licensee but such is not the case. The Columbia was supposed to buy its engines from the Stoddard-Dayton, but this was not done, the Columbia making Knight engines at the Hartford plant.

This cancellation of the Stoddard-Dayton license leaves three concerns in this country with the right to make Knight motors—the F. B. Stearns Co., of Cleveland; the Lyons-Atlas company, of Indianapolis, and the makers of the Edwards-Knight.

GRABOWSKY PLANT FOR SALE

Detroit, Mich., Dec. 17—Lee E. Joslyn, referee in bankruptcy, has given notice to creditors of the Grabowsky Power Wagon Co., of Detroit, bankrupt, that property of the company will be sold by the Security Trust Co., of Detroit, trustee, which will receive sealed bids in its office in Detroit up to December 23. Each bidder is required to deposit a certified check, payable to the trust company, to the amount of 15 per cent of its bid, and each bidder may bid upon the whole or any separate parcel of the property, the deposit to be forfeited should the bidder, after being declared successful, refuse to carry out the provisions of the bids.

The inventory includes real estate to the amount of $168,552.98, which is appraised at $140,000. Other items are: Machinery, inventory, $60,777.84; appraisal, $42,456.68; equipment, $10,255.10; appraisal, $6,026.26; furniture and fixtures, inventory, $6,809.73; appraisal, $5,144.42; jigs and tools, inventory, $19,517.04; appraisal, $16,032.19; patterns, inventory, $11,913.41; appraisal, $5,848.31; material, inventory, $122,023.30; appraisal, $100,696.88; miscellaneous, inventory, $448.01; appraisal, $436.60. The inventory total is $400,297.41, while the total of the appraisal is $316,641.34.

Holders of Non-Poppet Motor Patents Cancels Manufacturing Rights

Fifteen per cent of the amount bid must be paid by December 25 and the balance as soon as the property is turned over. The Grabowsky Power Wagon Co. was adjudicated a bankrupt by Judge Tuttle in the United States district court in Detroit, November 23.

JANNEY R. C. H. GENERAL MANAGER

Detroit, Mich., Dec. 17—P. R. Janney, at present general manager of the Peninsular Motor Co., Saginaw, Mich., maker of the Marquette cars, will on January 1 become general manager of the R. C. H. Corporation, to succeed J. F. Hartz, who was chosen to direct the concern's affairs on November 8. Following the reorganization of the company, Mr. Hartz's resignation is ascribed to his inability to devote sufficient time to the R. C. H. affairs, owing to his other business interests which command much attention.

Mr. Janney had been associated with the General Motors for some time prior to the taking hold of the Marquette affairs, he having been engaged to wind up the Randolph Motor Car Co.'s business. Mr. Hartz retains the office of treasurer.

A hurried conference of R. C. H. branch managers from all parts of the country was held in this city today, the new management being made known to them. One of the objects of this conference was to take steps for the discontinuing of a number of branch houses and to replace them by dealers. This move should greatly decrease the corporation's operating expenses.

TO CONTINUE VAUGHAN CAR

New York, Dec. 17—The Vaughan Motor Car Co., capital $1,000,000, has just been incorporated to take over the Woods Mfg. Co., of Kingston, N. Y., and to continue making the Vaughan car. It is tentatively proposed to make 500 cars in 1913. The new company will have $300,000 of cumulative preferred stock and $700,000 of common.

INTERNATIONAL REORGANIZING

New York, Dec. 18—Reorganization of the International Motor Co. will be along these lines: The holders of common stock are requested to deposit their certificates from which 55 per cent will be deducted. The financial syndicate, managed by Frederick W. Allen and Z. S. Freeman, representing large stock interests, have pledged themselves to furnish $1,500,000 additional capital for the company.

All common stockholders are privileged to subscribe for parts of this loan. A bonus of 200 per cent par value of common stock will be given to the lenders, giving them control of the property.

The company has had an active, prosperous year and its business has been 90 per cent greater than in the corresponding period of 1911. The company has delivered or is in process of manufacturing to fill orders, 1,143 trucks valued at $4,439,703. The net earnings for the first 10 months of 1912 are $335,000, or about double the dividend requirements. The difficulty lay in trying to stretch out working capital too thinly in the face of an inherited inventory of $2,700,000 which came to the present company at the time of the merger, a considerable part of which was unliquidated.

The new interests will elect a majority of the board and Vice-president Dickerman, of the American Car and Foundry Co., has been engaged to make a detailed inspection of the property, which will occupy 4 months.

MILWAUKEE'S SHOW ROW SETTLED

Milwaukee, Wis., Dec. 17—After a week of turmoil, during which a new organization of motor car dealers was actually organized and articles of incorporation filed, an exposition hall leased for a second motor show to compete with the regular Milwaukee show, and several skirmishes in a warfare between two factions of dealers fought, it was announced on Monday that there will be but one motor show in Milwaukee for 1913, and it will be promoted with the united efforts of the entire motor car trade of the city.

A week ago today the Milwaukee Motor Show Association, organized by members of the Milwaukee Automobile Dealers' Association, and incorporated without capital stock, issued blanks for space in the 1913 Milwaukee show, to be given from January 11 to 17, inclusive in the Auditorium. The blanks were issued to all of the dealers in Milwaukee, about sixty in number, of which twenty-two are affiliated with the M. A. D. A. Tuesday night twenty-four of the dealers who are not affiliated, met and organized the Milwaukee Progressive Automobile Dealers' Association, the principal object of which was to conduct a motor show according to its own ideas of how a motor show ought to be run. A tentative lease was made with the management of the Hippodrome, an exposition palace of lesser proportions than the Auditorium, which, by the way, was the home of Milwaukee's first motor show when the Milwaukee Automobile Club started the ball rolling in 1908. The tentative dates were January 11 to 17, inclusive, or the same period set for the regular show of the Milwaukee Motor Show Association.

It appears that the so-called progressive

dealers were dissatisfied with the conditions made by the motor show society and determined to run their own show on a co-operative plan. The progressives claim that not only was the price per space increased $50 over that charged at the 1912 show, but certain other conditions were imposed which made it advisable for them to get busy and run their own exposition.

As soon as the progressives announced their plans, the regular organization got busy and negotiated for a compromise, so that Milwaukee would not be called upon to support two shows at the same time, a condition which might result in either two failures or two successes. The conferences lasted over Sunday, and on Monday it was announced that a compromise had been effected and there would be but one grand and glorious exhibition, supported by the combined forces of the Milwaukee dealers, representing about eighty-five or ninety pleasure cars of various makes, to be shown in the Auditorium building, the whole to be presented to the curious gaze of the waiting public from Saturday evening, January 11, to Friday evening, January 17.

INDIANA DISCUSSES ROADS

Indianapolis, Ind., Dec. 16—The present Indiana road building and road maintenance system was condemned and a radically new system proposed, at the meeting of the Indiana Better Roads Convention held at the German house in this city, Wednesday, Thursday and Friday of last week. It is seldom that a more attractive program has been arranged, than that presented at the convention.

The convention was a congress of several hundred advocates of good roads from all parts of Indiana. In addition, some of the road building experts of the United States government were present, as were other good roads advocates of the country.

It was the unanimous opinion that the present haphazard method of road building is extravagant and wasteful, that the roads built have no degree of permanency and that the whole system is wrong.

The convention proposed that a state highway commission be formed and that a state fund be created by means of a special road tax and a vehicle tax for all motor vehicles and chauffeurs. In accordance with these recommendations, a bill has been drawn which will be introduced in the legislature next month, which recommends taxing by horsepower.

PRIZE FOR NEW FUEL

London, Dec. 7—The Society of Motor Manufacturers and Traders has offered a prize of $10,000 for a home-produced motor fuel at a commercial price and obtainable in sufficient quantities to make it possible for motoring use.

Philadelphia's New Club House Opened

Quaker Motorists Take Possession of Handsome Quarters

PHILADELPHIA, Pa., Dec. 14—With ceremonies appropriate to the occasion, the formal opening of the new club house and garage of the Automobile Club of Philadelphia on Twenty-third street, between Market and Chestnut streets, took place today. At the same time the announcement was made that the proposition submitted to members to lease the mammoth building to the Philadelphia Automobile Trade Association from January 15 to February 5 for the purpose of holding the annual show there, had been approved. The show will extend over 2 weeks, from January 18 to February 1.

Powell Evans, president of the Automobile Club of Philadelphia, officiated and made the dedication address at the laying of the cornerstone in the Ludlow street corner of the structure. Mr. Evans, in a brief talk, reviewed the object and aims of the organization and what it hopes to accomplish, with the co-operation of the members, in the working out of legislative problems of interest to the motorist and public alike and in the development of good roads. Open house was the order of the day and all afternoon members and friends inspected the new quarters.

The Automobile Club of Philadelphia's building formally dedicated this afternoon represents the growth of an agitation inaugurated years ago for the ownership of a building containing a garage for the use of members. The building is a handsome fireproof concrete and steel structure occupying a lot containing ¾ acre. The entire front, extending 237 feet along Twenty-third street south of Market, is wired glass, inclosed in steel framework, giving the interior of the building perfect natural light during the day. The lot has a depth of 140 feet. The location is an ideal one, being on the traveled line to the business section of the city, Broad street and Fairmount park, and is readily accessible to all the outlying districts.

As at present constructed, the building is three stories in height, each floor containing 30,000 square feet of space. Ultimately it will be six stories high, with an estimated capacity for storing 750 cars. The structure contains every modern convenience and necessity. In addition to spacious club rooms, offices and board of directors' quarters, there also are perfectly appointed chauffeurs' quarters provided with lounging rooms, bath and wash rooms; repair and machine shop, etc. The club operates a touring information bureau, law and ordinance bureau, a co-operative supply bureau and issues a monthly bulletin and yearly route book. The club is 12 years old and has grown from an initial membership of sixteen, occupying a room on the top floor of the Manufacturers' Club, to a present membership of 1,600, the largest in Pennsylvania and one of the largest in the country. Powell Evans, as chairman of the finance and construction committee, was most active in carrying the plans to completion.

HEMERY SMASHES RECORDS

London, Dec. 7—Hemery in one of the Lorraine-Dietrichs which was built for the last French grand prix, which has a four-cylinder 6¼ by 8-inch motor, succeeded November 27 on the Brooklands speedway in smashing all world's records from 1 to 6 hours, inclusive, and from 100 to 500 miles, with the exception of the 300-mile mark. In the run Hemery made five stops in all, aggregating about 45 minutes, one being 23 minutes in duration for the purpose of replacing broken spring bolts. He had no motor trouble whatsoever. The following table shows the new records and the old:

BY MILES

Distance	New Record	M. P. H.	Old Record
100	1:01:27.69	97.62	1:04:51.16
150	1:31:52.06	97.97	1:44:30.16
200	2:05:58.73	95.51	2:17:56.36
400	4:34:23.87	87.46	5:05:53.36
500	5:48:38.87	86.05	6:40:16.45

The Sunbeam formerly held the 100, 400 and 500-mile records; the others belonged to the Thamses.

BY HOURS

Hour	New Record Miles	New Record Yards	M. P. H.	Old Record Miles	Old Record Yards
1	97	1,037	97.59	92	797
2	189	1,747	94.99	173	810
3	284	817	94.82	261	1,653
4	344	1,344	86.19	319	242
5	422	1,574	84.59	391	1,429
6	518	312	86.36	451	445

The Sunbeam held the 1, 4, 5 and 6-hour records and the Thames the 2 and 3-hour.

INDIANA ASSOCIATION FORMED

Indianapolis, Ind., Dec. 17—The Indiana State Automobile Association has been formed by representatives of the various motoring clubs of the state. Clubs which have a charter membership in the state organization are the Hoosier Motor Club of this city; Salem Automobile Club, Salem; Madison Auto Club, Madison; Terre Haute Auto Club, Terre Haute; Winchester Auto Club, Terre Haute, and Evansville Auto Club, Evansville.

Officers of the organization are: President, P. C. Rubush, an Indianapolis architect and vice-president of the Hoosier club; second vice-president, Samuel Lane, president of Terre Haute Club; first vice-president, W. A. Koch, president Evansville club; secretary-treasurer, W. S. Gilbreath, secretary Hoosier Club. The state club will be affiliated with the A. A. A. A. G. Batcholder, chairman of the executive committee of the A. A. A., addressed the meeting at which the club was formed.

The Readers

EDITOR'S NOTE—In this department Motor Age answers free of charge questions regarding motor problems and invites the discussion of pertinent subjects. Correspondence is solicited from subscribers and others. All communications must be properly signed, and should the writer not wish his name to appear he may adopt a nom de plume.

Remedy for Common Evil

Ohioan Tells How Small Boys Who Bother Truck Drivers May Be Foiled

LIMA, O.—Editor Motor Age—One of the hardest things for a truck driver to overcome is the practice of the small boy and often of the larger ones, of hanging on the rear or running along the sides of the machine. The boys are not only in danger themselves, but often by their noise or dangerous position so attract the attention of the driver that he has often made fatal and disastrous mistakes just at the time when he should have been most cautious and careful. But the remedy, and a very effective one, has been found, and if more truck drivers equipped their trucks with the following described apparatus, Fig 3, there would be a considerable decrease in the number of accidents to motor trucks.

This method consists in charging the metal parts of the truck from an induction coil so that when the boy touches it he will receive a shock of sufficient force to make him let loose instantly and it will also teach him to be careful of what he touches thereafter.

In order that more drivers may take advantage of this, I will describe an economical method of installing the necessary apparatus. Secure from a garage a second-hand single unit vibrator coil—these can usually be purchased for a small sum as they are out of date—even if it only gives a ¼-inch spark on four dry cells it will be strong enough. Then cover the tail board or that part of the truck which the boys catch hold of with sheet metal in order to make a conductor of it.

Then mount your coil on dash or back of seat and connect the secondary or high-tension terminal to the sheet metal on the rear of the truck with a well insulated wire, keeping it well away from the metal frame, after which connect four dry cells in series to the primary or battery terminals of the coil and in this primary circuit place a push button switch so connected that when the button is pushed the circuit will be closed. This button may be mounted on the steering wheel or in any other convenient place. A ground wire should be run from one of the battery terminals to the main frame of the car.

Then when the push button is pressed, all the metal on the car is charged and anyone coming in contact with it will be shocked just enough to make him understand that a truck is private property and not to be trespassed upon. No more than four dry cells should be used, as any more would make the shock too severe.

The writer can vouch for the effectiveness of this system as he has used one similar to it for the last 6 months with the greatest of success, and what is of more consequence, other drivers inform me that they are having less trouble than formerly as it seems to create a respect for trucks in the mind of the small boy. —Fred. Lause.

ON CAMBERED REAR AXLES

Steubenville, O.—Editor Motor Age—In Motor Age issue November 7 is a reproduction of the DeDion Bouton. I do not quite understand the way in which the driving axles are constructed and the manner in which the rear wheels are kept in line. From the illustration it appears as though there would necessarily be a universal joint on each side of the differential. Could Motor Age give a view of the car from the rear, or further explain the one referred to? Also kindly state how the Peerless people camber the rear wheels? How do they line up the axles?—A Reader.

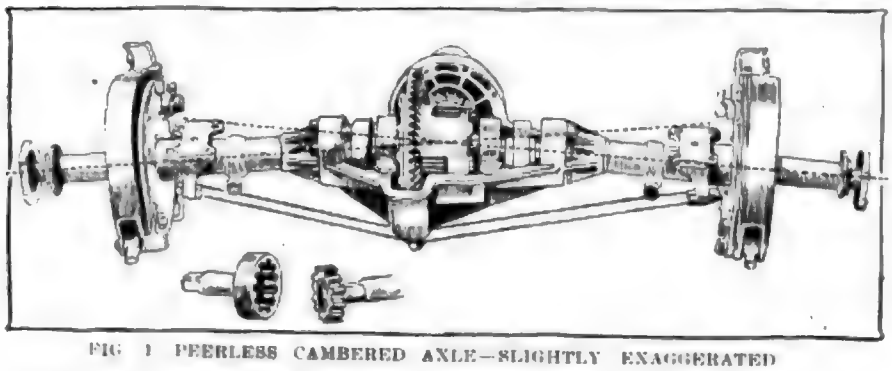


FIG. 1 PEERLESS CAMBERED AXLE—SLIGHTLY EXAGGERATED

The DeDion Bouton rear axle proper is a light tubular dead axle, which carries two bearings for the transverse cardan shafts that act as driving members. The worm-driven differential is secured in its housing to the frame at the rear of the car. The transverse drive-shafts run from the housing to the bearings on the rear axle, and are fitted with two inclosed telescopic universal joints each. A universal is fitted to the main drive-shaft between the differential and the gearset, but it has but little movement, being provided as a measure against strains being applied to the shaft by the distortion of the frame. This axle is shown in a rear view in Fig. 2.

The Peerless rear axle resembles the DeDion in that it also employs universal joints, but differs in that the differential is housed by the axle, and is driven by the usual flexible shaft. The drive is taken to the differential in the usual manner, but instead of the two drive-axles extending across on a horizontal center they are slightly dropped at their outer ends, the drive from the differential being through universal joints. This is for the purpose of cambering the rear wheels, permitting them to be dished and thereby gaining strength. Unlike the DeDion universals those used in the Peerless rear axle have a very restricted movement, and are but two in number, and hence may be made of a very efficient type. This is illustrated in the figure. The drive-axles of the Peerless rear axle are not lined up, but enter the differential at an angle, which is corrected by the universal joints.

EXHAUST VALVE OPENS EARLY

Joliet, Mont.—Editor Motor Age—What causes a motor to have one cylinder slightly louder than the other three? The motor runs well except in this regard and seems to be slightly lame when pulling heavy at slow motor speed, enough to cause quite a little vibration at times. When the motor is running one can notice that one of the exhausts is slightly louder than the balance and of a sharper sound. This is doing no damage other than that it is annoying. It is a 4⅛ by 4½-inch motor of the valve-in-the-head type. The compression is good in all cylinders and the valves are all right. The exhaust has always been this way. I have not timed the valves with the flywheel, as it has never been changed and the camshaft is integral with the cams. I am of the impression that the camshaft is at fault as it appears that one valve is slightly out of time.

2—I would like the names of carbureters without springs, using a valve or weight to perform the same purpose; also a carbureter without a spray nozzle. I have one of this construction called the Gould, the manufacture of which has been discontinued because of patent infringements. I would like to get something similar.—W. D. Parsons.

1—It is evident that the exhaust valve

Clearing House

EDITOR'S NOTE—To the readers of the Clearing House columns: Motor Age insists on having bona fide signatures to all communications published in this department, not necessarily for publication but as an evidence of good faith. Motor Age will not publish communications where this rule is not lived up to.

of this cylinder opens earlier than the rest, so that the gas is allowed to escape when it is at higher pressure than the others. This may be caused, as you suspect, by faulty cutting of the cams, but the likelihood is very small, as integral camshafts seldom vary, being cut on automatic or semi-automatic machines and to conform to jigs and to pass inspections within very narrow limits. It is more likely that the length of the valve rods is at fault. If these are of the adjustable type, shorten up on the offending rod slightly. This will give a little more play than was had formerly, with the result that the valve will open a little later. It is possible also that the other valves have too much play in their action, so that they open too late. This would mean that the cylinder that sounded the loudest was the only one whose valves were working properly. Which of these is the case may be determined by running the motor on this cylinder alone, suddenly switching to another, and running that one alone. If the motor runs faster on the second, the other three are at fault. If it runs faster on the second, the fault is with the first cylinder. There can be little harm in such a condition, except as to cam wear. It is likely that the wear is more severe where the play is not so great.

2—The air-friction carbureter is without a nozzle, while the A. B. C., Newcomb, Stewart, Zenith, Excelsior, G & T, Miller and White & Poppe are without springs.

DELCO DATA

White Hall, Ill.—Editor Motor Age—I desire some information on the Delco lighting and starting system used on the 1913 Hudson cars. Does the Oldsmobile use the same as the Hudson?

2—Did the Cadillac use the same last year as the Hudson is using this year?

3—What other makes are using the Delco system this year, or will use it on their 1913 models?—E. C. B.

1—The Delco system as used on the Hudson differs from that used on the Cadillac in that in the former application the distributor is mounted as a unit with the generator, while in the latter it is not.

2—No, the Cadillac Delco installation is similar to that used by the Oldsmobile, but differs in minor details.

3—The users of the Delco system for 1913 are: Cadillac Motor Car Co., Hudson Motor Car Co., Cole Motor Car Co., Oakland Motor Car Co., Olds Motor Works, and Packard Motor Car Co., starting and lighting only.

THE KNOX-MARTIN TRACTOR

Mounds, Utah—Editor Motor Age—In Motor Age issue October 10, page 42, a 15-ton Knox ash cart is illustrated. What are the dimensions of its engine?

2—What is the gear ratio to the rear wheels?

3—Diameter of the rear or driving wheels?

4—Maximum grade it will climb with same gearing? Naturally, this question is intended as referring to a grade of a length to more than use up the momentum of a run.

5—What type of bearings is used in the driving wheels?

6—What type of bearings is used for wheels carrying the heaviest of the load or cart wheels?

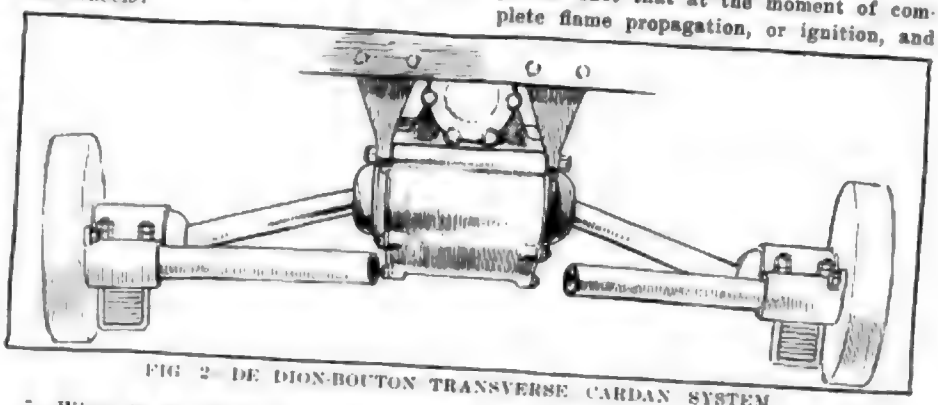


FIG. 2—DE DION-BOUTON TRANSVERSE CARDAN SYSTEM

7—What is the weight of the entire vehicle empty?

8—Give me the names of American manufacturers building motor road trains?—H. A. Hart.

1—The Knox motor, 4-cylinder, 5 by 5½ inches, is used on this tractor.

2—It is geared 12.6 to 1.

3—The driving wheels are 38 inches tire diameter.

4—The Martin tractor is guaranteed to climb a 10 per cent grade, but in a test on California Street hill, San Francisco, it climbed a 20 per cent grade with 8½ tons of lumber on the trailer.

5—Timken type R bearings are used in the rear wheels of the tractor.

6—The wheels used on the trailer run on plain bronze bearings.

7—The weight of the tractor is 3,250 pounds.

8—No road trains are regularly built in America. Tractors similar to the Martin, of the electric type, are built by the General Vehicle Co., of Long Island City, N. Y., and the Couple-Gear Co., of Grand Rapids, Mich.

Carpenter on Long Stroke

Sauk Center Expresses Opinions in Favor of Large Bores for Motor Car Engines

SAUK CENTER, Minn.—Editor Motor Age—I wish to say a few words in support of Charles E. Duryea in Motor Age of November 14. Mr. Duryea gives a most logical argument in favor of the short-stroke motor, and it really seems superfluous for me to add anything in support. I have used both kinds and much prefer the short stroke for many reasons, of which I will give a few.

The short stroke is nearly free from vibration, nearly as flexible as steam in the four-cylinder motor, and in the six it is estimated that it is a little more easy of control and considerable more flexible than steam.

As for greater expansion I fail to see wherein the long stroke comes in or the gain thereby, as the fundamental principles were laid down over 50 years ago and it is useless for us to refer to them only in a mere superficial way. It is a proven fact that at the moment of complete flame propagation, or ignition, and the total burning of the gases, that the energy developed is far greatest at this instant, and as a matter of fact the more this gas expands the less its power and energy for simple and unalterable laws of nature, as we shall illustrate hereafter. The shock or concussion of a cannon is greater the nearer you are to it and the farther away the less for very simple reasons, which need not here be stated.

When I was a boy a rifle had to be from 40 to 50 inches long in its barrel to be a good, hard, accurate shooter, and in the light of today who would think of appearing ready for the field or forest equipped with such a gun? Experiments have been going on with the rifle and shotgun for a goodly number of years past, and now we have arrived at the truth of the matter under consideration, that the rifle to be best must be about 24 to 28 inches long of barrel, and the shotgun from 28 to 32 inches, with a 30-inch barrel as a standard.

A far greater inertia is established in the short-barreled rifle or shotgun than those of former years for reasons that

have been wrung out of nature's storehouse of knowledge, and scientifically proven best! Who would think for a moment that a rifle, for instance with a barrel a mile long, could this be possible, would do greater execution in use than the modern high-power gun with its 24 to 30-inch barrel? Here we would get far greater expansion, so much more that the bullet would, in all probability, not leave the barrel! Energy is greatest when it is immediately liberated from its controlled home, and becomes weaker as it seeks the realms of space.

In testing explosives the highest power is recorded at the instant of complete propagation of the gases or energies liberated. The short stroke motor is ideal for its quietness, tremendous energy liberated, easy control, strong chankshaft, short head, compactness in a nutshell, and last, but not least, flexibility, which has brought it side by side and face to face with that old, reliable power, steam. Further, today we see this ye-olden-tyme wasted product, gasoline, the moving spirit in thousands of ways upon both land and sea, developing its almost unlimited resources to the betterment of mankind.

And when it comes to speed the short-stroke motor has demonstrated its superiority upon the race course to the utter satisfaction of its users, and there is no need of comment here in this respect. Its less angularity of connecting rods with shorter piston heads makes it less liable to wear, while the easy manner in which it compresses its charge is very apparent to all who investigate. The cylinder is far more easily lubricated with less oil and less resistance, which must be taken into account.

The short-stroke motor is lighter than the long-stroke, far easier of adjustment and we firmly believe greatly more durable in use upon a motor car than the long-stroke, for one readily understands that driving a long-stroke crankshaft at short crankshaft speed would mean a loss much in excess of the lighter motor, with its life greatly shortened.

What we need in the motor world of usability are ease of operating, durability, reliability, accessibility, flexibility, and all these at the minimum of cost.—A. D. Carpenter.

Fitting the Tire Chains

Kansan Explains Simple Method of Applying Non-Skid Attachment to the Tires

KANSAS CITY, Mo.—Editor Motor Age—There is nothing about the car more important than the tire chains, and on account of the difficulty of putting them on and removing them they are not put on as often as they should be. Chances are often taken which endanger life as well as the car. The following easy method of applying and removing the chains is given with the hope that it will make less difficult this distasteful task and be the means of saving some one a wheel if not a serious accident.

Take the chain for the right rear wheel, holding the hook end of the inside chain in the left hand and about 2 feet farther down grasp the same chain in the right hand; stretch this chain tight and lay it down behind and outside of the right rear wheel. Still stretching this chain tight, move it in behind the wheel. This will lay the chain straight as per the sketch, Fig. 4. Proceed in a like manner with the chain for the left wheel, then move the car back until it stands on the straight cross links.

Taking the loop ends of the side chains in the hands, straighten them out and carry the chain back over the wheel, after which go to the rear and the ends will be in a convenient position for hooking. Fasten the inside chain first and then the outside.

To remove and bag the chains, unhook and move the car off from them, washing and drying them, if muddy, or permitting them to dry and remove the mud by beating the chain on the pavement.

Inasmuch as chains are made of steel, they will quickly rust if not cared for. For this reason wet chains should never be put in the bag when wet, to rust out. Frequently, when a careless owner removes his chains from beneath the rear seat, they are rusted into a solid block. Chains should be swabbed with oil grease, or kerosene, before laying away for perhaps several weeks, out of sight and mind.

To put the chains in the bag for carrying them is a difficult feat for one person by the old method of holding the chain in one hand and the bag in the other. The following method will be found more simpler. Hang the chain by its center upon any convenient object such as a top iron, high enough to permit the ends to clear the ground. Then holding the bag in the two hands with the opening below the chain, raise the bag over the chain at the same time lifting the chain off from the top iron and you have the chain quickly bagged.—F. R. Sanborn.

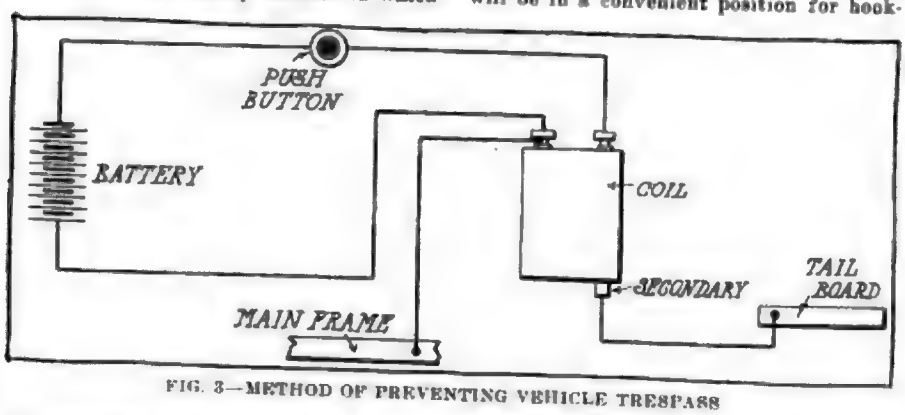


FIG. 3—METHOD OF PREVENTING VEHICLE TRESPASS

SOME NEW TIRE REPAIR POINTS

Marshall, Minn.—Editor Motor Age—When a broken beer bottle, or a similar cutting curse, has viciously dug out a chunk of rubber from the surface of your casing, exposing the fabric, an immediate repair is very desirable. The small gasoline vulcanizer which every driver with a proper amount of foresight now carries in his kit, can be used to good advantage if the plan here given is followed.

After jacking up the wheel, allow about half the air to remain in if possible, thus compress the casing on the sides near the injury so that place to be repaired shall present a convex surface, more so than is normal when the tire is in use. This may best be accomplished with a small clamp, but if this is not at hand two round sticks compressed to the sides with a strap, will answer the purpose. The surface to be repaired should bulge out considerably.

Clean well with gasoline, then loosen up and undermine the edges of the rubber around the exposed fabric with a sharp point, so as to allow the patching material to be inserted underneath about ¼ inch. Cut a piece of unvulcanized rubber patching material a little larger than the exposed surface and carefully insert the edges under the undermined rubber. Wet this patch with gasoline and cover it with another patch a little larger than the first, and apply the gasoline vulcanizer snugly over the patches. When the vulcanizer is removed the surface patched should be considerably more convex than the usual curve of the casing when in use. This is very essential, as otherwise the patch material will be subjected to a pulling strain when in use which tends towards separation, while if done as directed the patch material will be under compression when in use.

It sometimes happens that a section of inner tube becomes destroyed, or it is desirable that a part be removed and a new section be introduced by splicing, either from injury or to change it to suit a larger wheel diameter. The following plan gives good practical results:

After determining the distance between the cut ends of the tube that must be replaced in order to secure the desired length, cut a section of an old or discarded tube which is perfect enough to use 4 inches longer than the gap to be filled. Cut out the ends of an old tin fruit can which has about the same diameter of the

tube to be repaired, and insert it into the end of the section that is to be attached, allowing the rubber to project over the tin a trifle.

Pull the end of the inner tube over the end of the section which contains the tin can about 2 inches, then roll it back about 1½ inch. Thoroughly clean with gasoline the rubber around the can and wrap around it a strip of unvulcanized rubber about 1 inch wide, allowing the ends to lap about ½ inch. Apply liquid rubber cement over the strip and rubber adjacent to it, then roll back the end of the inner tube so as to completely cover the unvulcanized strip. With stout cord wrap the joint evenly for the whole 2 inches, and allow to remain for 12 hours. Then remove the cord and by rolling back the free end of the added section remove the can. Insert paper inside the section to be added so that the inner walls will not adhere, and vulcanize with the little gasoline vulcanizer, part at a time, until the entire diameter is treated.

Now insert the end of the added section into the tin can, instead of placing the tin on the inside as before, allowing the end of the section to protrude about 2 inches. Turn this protruding part back over the part around the can, and place a 1 inch wide strip of unvulcanized rubber around it with the ends lapping ½ inch. Clean with gasoline and apply cement, then pull the free end of the tube over the prepared surface just 2 inches, and wrap with cord as before.

When this has remained for about 12 hours undisturbed it will be firmly attached and the spliced surfaces may then be rolled off the can and the can cut so as to remove it from around the inner tube. The splice may then be vulcanized in sections as previously, using care to make the vulcanized portions lap a little.

Where it is possible to do so a patch on the inner side of an inner tube will give a more nearly perfect result. This may be easily done in all openings except small punctures, where it is not required. In large wounds a patch on both sides of the tube will be best.

When from lack of foresight no provision has been made for punctures away from the usual places of repair, restoring a leaky inner tube may be quickly accomplished by the use of common surgeon's adhesive rubber plaster, obtainable for a few cents at any drug store. This plaster comes rolled on tin spools containing from 5 to 10 yards, 1 to 3 inches in width. A wise driver always will carry one of these spools. The plaster is used to prevent bleeding of air from the tire in the same way as it is used by the surgeon to prevent loss of blood from a wound.

When other means are not at hand this plaster may be wrapped around a bad blow-out, using several layers, and permit getting home without too much injury to the religious nature.—A. D. Hard.

Copper Cylinder Jackets

Electric and Air Engine Starters Discussed and Compared for Iowa Reader

JEWELL, Ia.—Editor Motor Age—Is not the copper waterjacket a patented feature of the Cadillac?

2—Are there any other makes of cars using the copper waterjacket?

3—What success is being obtained with the Delco electric starter? Is the Delco used on the Cole and other cars identical with the one used on the 1913 Cadillac? What other cars are using it?

4—Have any of the electric starters proved to be failures?

5—In what way does the Gray & Davis starter differ from the Delco?

6—Would not the air from a compressed-air starter interfere with perfect carburetion in starting the motor, especially in cold weather?—A Reader.

1—No, the use of copper waterjackets is not a patentable feature. The manner of application of those used in the Cadillac car, however, is covered by patents.

2—The Chadwick car, made by the Chadwick Engineering Co., Pottstown, Pa.

3—The Delco electric starting system has been pronounced a success by those manufacturers who have used it. Other cars using the Delco system are Oldsmobile, Hudson, Packard, Cole, Oakland.

4—Motor Age has not heard of any.

5—The Gray & Davis starter is a separate motor, geared to the clutch shaft, entirely distinct from the generator. In the Delco system they are one.

6—No. The air is introduced into the cylinders on the working stroke, through check valves. The suction is not interfered with, and upon the first explosion, the check-valve is closed, so that no air is admitted to the cylinder.

ADJUSTMENTS OF 1910 MOLINE

Astoria, O.—Editor Motor Age—What causes a 1¼-inch model L Schebler carbureter to overflow for 3 or 4 minutes every time the motor stops?

2—What should one do with a cone clutch to prevent a car starting with a jerk, say on a 1910 Moline?—J. O. Bay.

1—Your float-valve is out order on the end of the needle-valve of the gasoline feed on the Schebler model L, is the float-lever adjusting nut, which may be disconnected from the float lever and turned up to cause the valve to close at a lower gasoline level. Try it at one turn, and if this does not stop the flooding, give it one more. If the carbureter still floods the float is probably water-logged, and should be unscrewed from the float lever and dried over a radiator or in a moderate oven, and reshellaced. Dipping in thin shellac and drying, for several coats will be found the most satisfactory manner of restoring the float's buoyancy. In replacing the float, the supply-valve should be readjusted as for a new float.

2—The corks in the clutch facing are probably worn. It will temporarily relieve this condition if you will adjust the spring to a slightly softer pressure. However, you will find that this will produce a less positive grip, and in heavy pulling will probably result in clutch slippage. To make the repair permanent, the clutch must be disassembled, and new corks put in. To do this, take off the collar and thrust bearing. Then remove the six bolts of the housing, remove the spring, and take out the cone. Secure a new set of corks from your local agent. Remove the old ones which you will find have been worn down flush with the cone, and press the new ones in by hand, cutting them off, after they have been pressed in firmly, about ⅛ inch above the leather, and pound down nearly flush with a mallet. This will be found an easier repair than putting on a new leather facing, which you will be obliged to do if you run the clutch much longer with worn cork inserts.

REPLACING GEARS WITH RAWHIDE

Butte, Mont.—Editor Motor Age—I have a car with a Rutenber six-cylinder motor, a Bosch high-tension magneto, a battery system with a Heinze vibrating coil. I would like to know if I could change it into a dual system, and how it could be done.

2—The timing gear on this motor is very noisy. Could I have fiber or rawhide gears made? Does Motor Age think they would last any length of time where they come in contact with the oil. The gears that are on now make a clattering noise, although worn little.—T. H. S.

1—It is impossible to answer this question without knowing what type of Bosch magneto is used.

1—Rawhide gears frequently are used for this purpose, and are especially treated to resist oil and water. If your present gears are not badly worn or otherwise defective they should run with a reasonable amount of quiet. Motor Age would suggest that you try adjustment before discarding them. The best gears in the world will clatter if not meshing properly. Perhaps it is not the gears that are responsible at all, but the valve tappets.

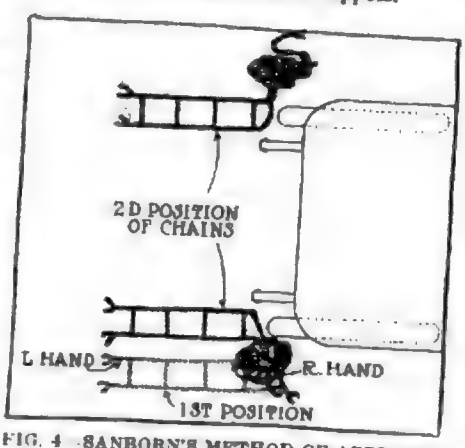


FIG. 4—SANBORN'S METHOD OF APPLYING CHAINS

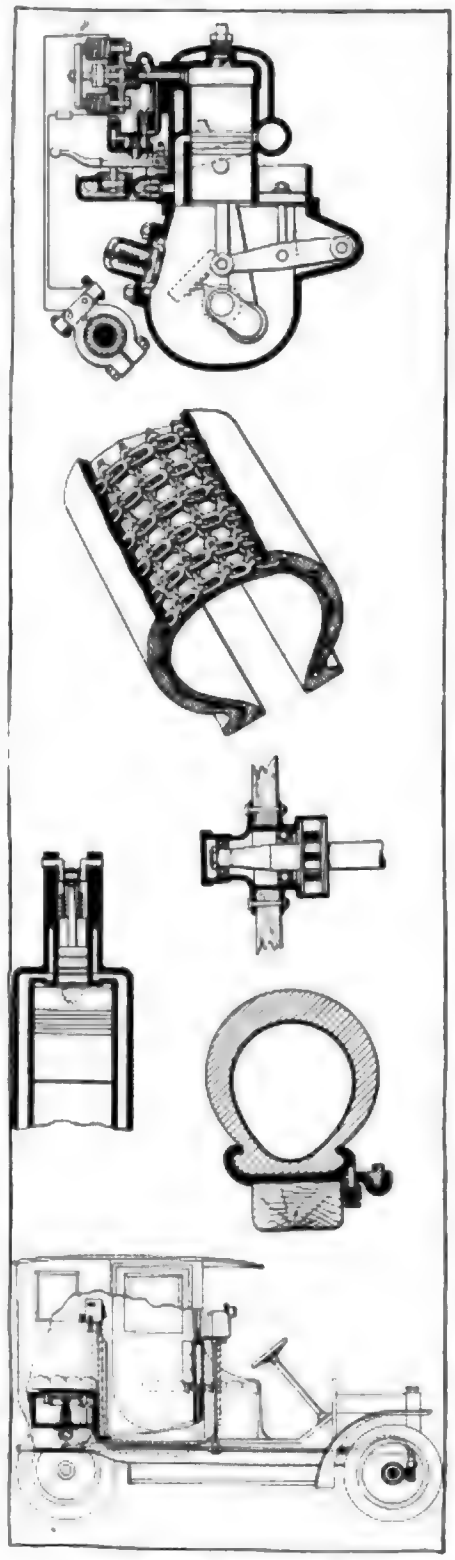
Current Motor Car Patents

THRUST Cushion—No. 1,046,589—To Harry Harding, Rochester, N. Y. Filed February 5, 1912, dated December 5, 1912. To absorb the shocks incident to turning, etc., that are exerted on the wheels and axles of vehicles, and thereby save them from shock and the vehicle from undue vibration, this device consists of a collar on the axle, facing a similar abutment on an extension cup on the hub of the wheel, between which springs, mounted on telescoping guides, are disposed. Disks are interposed between the opposing faces to reduce friction. These springs resist and cushion all inthrusts of the hubs upon the axle.

Automatic Taximeter Control—No. 1,046,808—To Max Kuhn and Raphael Netter, New York, said Netter assignor to Kuhn. Filed August 26, 1911, dated December 10, 1912. To automatically throw in a clutch in a taximeter for the purpose of registering fare for an additional passenger, this device consists of a pivoted seat, with a linkage connecting it to the clutch-operating mechanism. When the seat is up, fare will be recorded for the occupants of the other seats only, but when turned down for occupancy, the clutch will be engaged and fare for one more passenger will be recorded by the taximeter. The rear seat is likewise linked to a clutch. It is mounted on a vertical pillar, connected to an angle lever, and normally held in a raised position by a spring. The weight of a passenger actuates the clutch by pressing down the vertical pillar, and moving the lever.

Detachable Tire Arrangement—No. 1,046,855—To Peter Reconi, San Francisco, Cal. Filed October 21, 1911, dated December 10, 1912. In detaching a tire from the wheel, difficulty is often experienced in removing the locking split-ring, owing to the pressure of the clincher ring upon it. This device consists of a latch, adapted to hold this ring away from the locking ring, while it is removed or replaced. The latch comprises a spring bolt, located in the rim base and operated by a small knob.

Tire Mail—No. 1,046,451—To Joseph B. Duhring, Chestnut Hill, Pa. Filed December 15, 1911, dated December 10, 1912. Designed to be imbedded in the tread of a tire casing, this patent relates to a means of connecting the links of a chain so as to form one continuous fabric to resist blow-outs and skidding, upon being exposed. This method of joining consists of having the links of strands longitudinal of the tire tube, crossed by strands crosswise of the tire, the links being made of single stampings of sheet metal, each link of the longitudinal strands being inclosed on one leg by the half of the superimposed cross link above it. The chains so disposed are vulcanized in the tire as a part of the fabric, reinforcing the casing against blow-outs and yet by virtue of its interwoven construction, flexibility and lightness, hindering the resilience of the tire little.



PATENTS ISSUED DECEMBER 10, 1912
Randolph Engine
Duhring Tire
Harding Thrust and Butsch Valve
Reconi Rim
Kuhn & Netter Taximeter

Simple Piston Valve—No. 1,046,965—To Alphonse Butsch, St. Lucia, British West Indies. Filed October 1, 1909, renewed and this application filed September 27, 1912, dated December 10, 1912. In an internal combustion engine, this patent relates to a piston valve located in an auxiliary cylinder disposed in the head of the main cylinder. This valve-piston is connected to a crank, by which it is operated. When the piston is raised it uncovers the valve port, and when it descends, it closes it. This patent does not pertain to a complete engine, but only to the valve-action, hence its incompleteness.

Two-Cycle Engine—No. 1,046,491—To Alfred Randolph, Salem, Ohio. Filed August 24, 1910, dated December 10, 1912. Comprising a two-port two-cycle engine this patent relates to an engine in which a piston is adapted to induce alternately a suction and a compression in the crank case, for the purpose of drawing in air and expelling it through a port in the cylinder opened by the piston on the bottom of its stroke. In this crankcase is a small open-ended cylinder in which an auxiliary piston, linked to a lever operates, as actuated by an auxiliary connecting rod to the lever from the main piston. The purpose of this piston is to aid the main piston in drawing in a greater charge for compression and compressing it to a higer pressure before admission to the cylinder. Fuel is injected about the spark plug through an injection port, normally closed by a valve, which, electrically operated by means of electromagnets and an armature bar, is opened at the proper moment, as timed by a commutator geared to the engine, in the circuit of the operating magnets. In operation, on the explosion stroke, the piston and auxiliary piston are forced down, until the piston reaches the bottom of its stroke when the gases escape through the exhaust port. On the up stroke the piston and auxiliary piston move upwards, creating a vacuum in the crankcase, which is filled with air through a check-valve in the engine base. On the next downstroke this air is compressed and on the piston reaching the bottom of its stroke, the air is admitted to the cylinder through the transfer passage. During the upstroke the air is compressed in the cylinder and the injection valve electrically opened, injecting a charge of fuel, which is ignited on the piston reaching the top of its stroke.

The Motor Car Repair Shop

Ingenious Brake-Arm Adjustment

IN Fig. 1 is shown means of rendering the brake arms of a motor car adjustable to such an extent that the entire cam can be worn out before a replacement is required; and in taxicab service, where the strictest economy must be exercised to give efficient service at a profit, provisions of this sort are quite necessary. As in many cars, the brakes of the particular make of car on which this kink is practiced, are operated by a double-nosed cam which expands the ends of two semi-circular brake shoes. The cam in turn is secured to a short shaft, which is operated by a lever R located at its opposite end. When the cam becomes worn to a certain extent, the brake lever strikes against the rear-axle tubing T, thereby putting a stop to the pressure applied to the cam on the end of the brake-shoes, and so reducing the efficiency of the brakes.

To overcome all this trouble and get the maximum wear out of the cams, an an old but well applied scheme is used which consists in dividing the wrist at the lower end of the arm R, cutting teeth in the adjacent surfaces of the portions thus formed, and then just securing the one portion to the shaft with the pin P and holding the other portion in engagement with the teeth thereof by means of the nut N.

While on the subject of brake adjustments it might be well to add that although the operation of adjusting a set of brakes should be a very simple operation, some drivers are so negligent of their brakes that the task becomes a very difficult one. To adjust a set of brakes one should first see that the wheel bearings are properly adjusted, then set the brake bands so that there will be just enough clearance for about two thicknesses of ordinary letter paper to be slipped all the way around when the brakes are released. This is to prevent dragging. All working parts of the brake operating mechanisms should be well cleaned and oiled from time to time so that perfect freedom of action is assured. Owing to loose wheel bearings brake bands are often worn unevenly, and in such cases new linings or bands are necessary.

Wooden Horse Useful in Shop

Wooden horses are most useful articles of repairshop equipment, and every repairshop generally can use a half-dozen wooden horses to a good advantage. Where no other special facilities are provided they are most useful in supporting a motor or chassis in the process of cleaning, repair or overhauling; for supporting the body while removed from the chassis; or for the convenient support of any of the separate units of a motor car while operations are being performed upon them by the workmen of a shop.

Horse Repairshop Aid

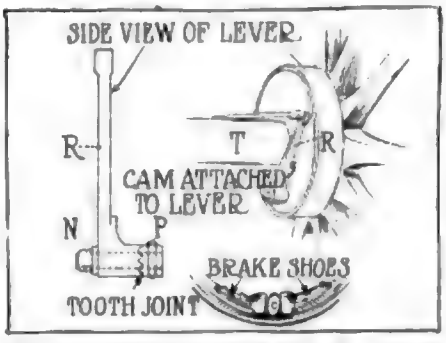


FIG. 1—NOVEL ADJUSTMENT OF BRAKE TO TAKE UP WEAR

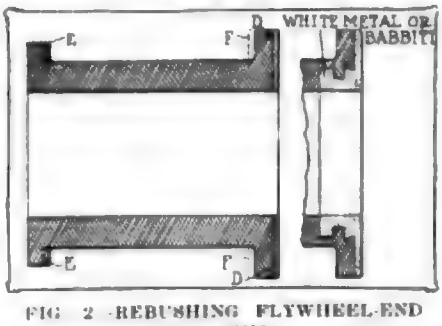


FIG. 2—REBUSHING FLYWHEEL-END BEARING

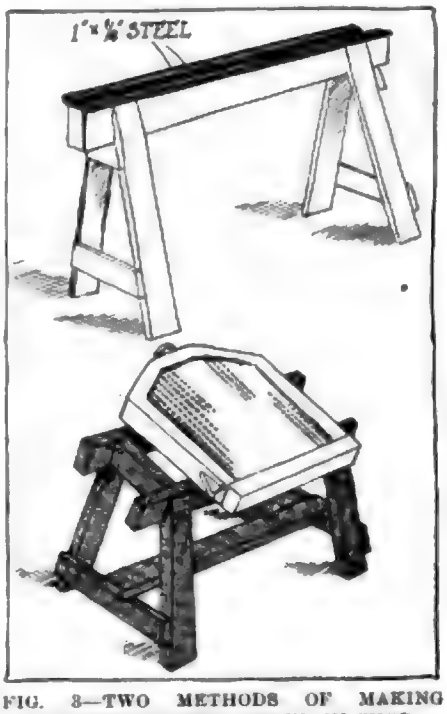


FIG. 3—TWO METHODS OF MAKING WOODEN HORSES USEFUL IN SHOP

Two small wooden horses are employed in one shop to support the rear end of a chassis while the rear axle is removed for inspection or repair. The springs of the vehicle rest on a piece of pipe in turn supported by wooden horses. In the same illustration is a motor mounted on a pair of wooden horses for a similar purpose. There are many other uses to which the wooden horse may be put, that will greatly facilitate the work of the repairman; and in so doing soon save the initial cost of their installation. In Fig. 3 two horses are shown. In the upper part of the illustration, a substantially constructed horse is shown with two strips of iron or steel about an inch wide and ¼-inch thick secured to the top of the horse throughout its length. Horses of this type are designed for supporting chassis and chassis frames while being re-riveted, straightened, etc.; the metal strips serving to protect the wood and maintain a true surface. The horse in the lower section of Fig. 3, is designed especially for the purpose of supporting radiators while being cleaned, inspected or repaired. A similar structure could be very easily arranged for temporary use by simply setting two ordinary horses side by side and securing them in this relative position by means of a couple of boards and some nails. A few boards laid across the top of a pair of horses also makes a very handy portable work bench or table.

Rebushing Motor End Bearing

There are many old cars in use in which there are no thrust bearings for the motor crankshaft other than a flange on the outer end of the flywheel-end bearing, thus when the throwing out of the clutch creates an end thrust on the crankshaft, there is a tendency toward rapid wear on this flange as indicated by the dotted line D, Fig. 2. The repair in such cases generally consists in cutting a little metal off the face of the flange to smooth and true it up, and cutting more metal off the smaller flange at the other end of the bearing, as indicated by the dotted line E, so that the bushing can be moved forward and the end play eliminated; the space indicated by the dotted line F would then be filled in with white metal or a brass ring sweated on.

At the right of this illustration is shown a more up-to-date and far more effective repair, which consists simply in replacing the worn-off metal with white metal. The bushing is turned out at the outer end with a dove-tail and groove to form a grip for the white metal, then by use of a suitable mold for pouring the white metal, the end of the flange is built up with it to its original contour. It is customary, of course, to make the white metal insertion a trifle larger than the original end of the bushing so that it may be machined and scraped to fit the crankshaft. It is claimed that a repair of this kind will outlast the rest of the bushing.

Four Winds

spoke on motor organizations and the good they accomplish. Many of the songs that made a hit during the minstrel show given by the association some months ago were sung by the members making the banquet a lively affair.

Winter Re-elected—A. F. Winter has been elected president of the Sheboygan Automobile Club, of Sheboygan, Wis., which recently was rejuvenated and now has a total of nearly 200 members. J. H. Optenberg was elected vice-president and Arthur F. Raab is the new secretary and treasurer. T. M. Bowler continues as counsel and will take an important part in the Wisconsin State A. A.'s work before the coming session of the legislature. The membership fee consists of $5 annual dues, nearly all of which is expended in highway improvement. Counsel Bowler and Secretary Raab are framing several ordinances for passage by the Sheboygan council, among them a universal light law, sensible signal act, and rules of the road law. Sheboygan is a city of 26,000 inhabitants.

California Signboarding—Eleven hundred miles of road in the arid desert country to the northeast of Los Angeles county, Cal., has been posted recently by the Automobile Club of Southern California. The work is being done by O. K. Parker, engineer of the local club, and is the first installment of about 5,000 miles of desert roads that soon will bear the welcome emblems of the club. The sign-posting already done is along the main and lateral roads between Daggett and Needles to the north and south of the Santa Fe railroad. Parker found the desert roads in fair condition, although in many places they were well nigh impassable. He spoke in glowing terms of the wooden motor road between Blythe Junction and Blythe, in the Palo Verde valley. The road is built of huge planks and is about 2½ miles long. It is erected over a stretch of bottomless sand and is the only road of its kind in the world.

Penn Collecting Fees—Revenue from 1913 motor licenses in Pennsylvania is already up to a tenth of the total income from that source for last year. Thus far 600 cars and 2,400 drivers have been licensed. Every car that is seen on the highways of the state after New Year's day or thereafter without an olive-green tag is being run in violation of the law and the owner is liable to arrest. The number of licenses issued during 1912 has passed the 65,000 mark.

Gophers Blazing Trails—Four crews are surveying in the northern part of Minnesota for highways to be built under the new Elwell law. One party is working on the projected International Falls-Twin City road, another on the Duluth-Winnipeg road, the third is at work on the Duluth-Moorhead road and the fourth on the Bemidji-Beaudette road. A concrete road is projected from Minneapolis to Hopkins on the Minnetonka highway. The Winona Automobile Association is planning to widen to 20 feet the Winona-Minnesota City road and resurfacing with gravel. This stretch is 2 miles.

Illinois After Road Data—Illinois farmers are asked to supply information to the Illinois legislative committee, appointed by the last general assembly to revise the road and bridge laws. A list of questions has been prepared, asking each farmer if he favors a continuation of the present system of road management and if not, to give his ideas for improvement. Farmers also are asked if they favor the construction of permanent hard roads with state aid, and if they want a special highway commission to have supervision over all roads of the state, with a county engineer to co-operate with the state body. It is believed that these questions will receive many replies and furnish the committee with an intelligent idea of the wishes of the agriculturists of the state.

Antigo Active—The Antigo Automobile Club and the Commercial Club of Antigo, Wis., have formed an alliance to boost the good roads movement and to raise funds for improvement of highways until the county government can make permanent improvements with state aid. During the past summer the two associations have jointly superintended and paid for the construction of a mile of model highway running out of the city. The county has built several miles of macadam road, following the example. Next year the county has determined to expend $25,000 in permanent improvement.

Another Baltimore Tax Asked—Dealers and owners of motor cars in Baltimore city are aroused over the plan of Mayor Preston and City Solicitor Field to introduce an ordinance in the city council taxing cars from $5 to $50. The Automobile Club of Maryland will fight the proposed tax, the members claiming the tax will have a harmful effect upon the business locally and will make Baltimore the laughing stock of the country. This tax, if favored by the city authorities, will make four the owners of cars in Baltimore will have to pay. At present they pay $20 for an owners' license, $2 for an operator's license in addition to personal taxes to the city and state.

Making a Test Case—"For impeding traffic and creating a nuisance" three Philadelphia owners of cars placarded "To Hire" were arrested and fined for parking their cars in the street. The action has attracted considerable attention in view of the fact that counsel for the defendants brought up the point that taxicabs are permited to stand on the thoroughfares without molestation and that discrimination was shown. Just how the taxicabs will be affected in the future will in all likelihood be brought up soon. There already is an edict from the department of public safety in effect prohibiting the parking of machines in the street for more than 1 hour at a time.

Salt Lake In—That the west and Utah in particular is thoroughly aroused over the good roads question and the possibilities of the transcontinental tourist question, was shown when a hundred or more representative Salt Lake business men met at the commercial club and organized the Salt Lake council of the Colorado-Utah link of the Midland trail. The Midland trail association was formed at Grand Junction about a month ago with the avowed purpose of placing the Midland trail in first-class condition for tourists. Under the scheme or organization each town along the route is forming a local council to solicit funds for road construction and upkeep and success is being had on every hand.

No. 8.—In Old Dominion

SAME ROAD 1 YEAR AFTER BEING IMPROVED

Brief Business Announcements

LONG BEACH, Cal.—T. A. Stephens has started work on a two-story brick garage at 212 Locust street.

Columbus, O.—The Johnston Sales Co., agent for the R. C. H., has opened a new salesroom and garage at 115 North Wall street.

Detroit, Mich.—G. L. Willman, formerly sales and advertising manager of the Warren Motor Car Co., has taken an advertising position with the Studebaker Corporation.

Washington, D. C.—F. W. Powers, manager of the Goodyear Tire and Rubber Co.'s branch, has been promoted to the managership of the Philadelphia branch. His successor here has not yet been appointed.

New York—A. J. Fisk, formerly general manager of the Witherbee Storage Battery Co., and at present western sales manager for A. R. Mosler & Co., will represent the Ward-Leonard Electric Co., of Bronxville, New York, in the sale of automatic dynamo-lighting and self-starting systems.

St. Paul, Minn.—The Electric Mfg. Co., 353 Minnesota street, has enlarged its official force and increased the capital to $50,000. It will take possession of a new two-story building, 50 by 150 feet, February 1, and will carry a new line of supplies, in addition to taking the local agency for the Federal tires.

Dallas, Tex.—The Southwestern Motor Sales Co. has opened one of the largest sales agencies in the southwest and is handling the Lozier, Speedwell, Staver, Chevrolet and the Little lines in Texas and the southwest. The Southwestern Motor Sales Co. was organized about 60 days ago with an authorized capital of $200,000, with principal office at Dallas, Tex., and is officered as follows: Louis A. Boli, Jr., president and general manager; C. Charles Jones, vice-president; Martin A. Seward, vice-president; Nathan E. Jones, treasurer and purchasing agent. Walter L. Marsh, secretary; C. R. Jones, manager of truck department.

Phoenix, Ariz.—The Overland Auto Co. of this city has opened branches in Tucson, Yuma and Kingman.

Davenport, Iowa — Henry Jaeger has opened a garage opposite the New Kimball hotel on Fourth street. No agency has yet been announced.

Spokane, Wash. — The Spokane Auto Truck Co. has opened a garage under the management of W. P. Greenough at 121 Second avenue.

Detroit, Mich. — Alfred A. Greenburg, secretary of the Detroit section of the Society of Automobile Engineers, has undertaken the sales representation in this city of the products of the Baltimore Tube Co.

Los Angeles, Cal.—A contract has been awarded by the Ford Motor Co. for the erection of a reinforced concrete service building to cost $200,000. The building will be erected at Santa Fe avenue and East Seventh.

Lansing, Mich.—Henry Neller has purchased land on Turner street upon which he will erect a garage for A. S. Bennett and William Neller, who will conduct a general repair business, together with selling accessories. Mr. Bennett will continue the sale of the Krit cars. The garage will be two stories in height.

Washington, D. C.—The United Motor Washington Co., a branch of the United States Motor Co., has been dissolved, the Maxwell agency being given to H. B. Leary, Jr., and the Columbia to the Dupont Garage Co. Leary has leased the company's salesroom and the Dupont company has taken Leary's old quarters at 1317 Fourteenth street, N. W. The latter also handles the Rambler and Mitchell. John R. Thomas, former manager of the United Motor Washington Co., has been promoted

Recent Incorporations

Albany, N. Y.—Kenmore Garage Co., capital stock $1,000; incorporators, M. T. Adams, G. Keeler, W. L. Hill.

Boston, Mass.—F. A. Dutton Motor Co., capital stock, $25,000; incorporators, F. A. Dutton, C. A. Farnsworth, J. Smith.

Boston, Mass.—Motor Supply Shop, capital stock, $25,000; to deal in motor car supplies; incorporators, M. V. O'Neill, W. R. McDaniel, J. M. Hall.

Brookline, Mass.—Simplex Automobile Agency, capital stock $30,000; directors, H. A. Clapp, H. McCaffrey, F. O. White.

Brooklyn, N. Y.—Mel Stringer's Garage; capital stock, $10,000; to deal in motor cars; incorporators, F. R. Huntington, M. Stringer, J. Culleeny.

Brooklyn, N. Y.—Prospect Park South Garage, capital stock, $5,000; incorporators, D. Rathbun, A. M. Hicks, S. Plunkett.

Brooklyn, N. J.—American National Motor Bus Co., capital stock, $1,000,000; incorporators, C. A. Clarke, S. L. Conklin, J. A. Satterfield.

Buffalo, N. Y.—Regal Distributers, capital stock, $15,000; incorporators, C. A. Hailton, G. Bullis, S. F. Carr.

Buffalo, N. Y.—Buffalo Automobile Sales Corp., capital stock, $15,000; incorporators, W. J. Harris, W. U. Heverly, M. MacDonald.

Buffalo, N. Y.—Glide Sales Co., capital stock, $10,000; to deal in motor cars; incorporators, J. F. Lynch, L. P. Fuhrmann, E. T. Danahy.

Buffalo, N. Y.—Marvel Motor Car Co., capital stock, $25,000; incorporators, M. B. Franklin, G. B. Klein, H. Kleinhans.

Catskill, N. Y.—Peerless Garage Corp., capital stock $8,000; incorporators, J. A. Hill, C. R. Vermilyea, S. W. Hill, A. O. Vermilyea.

Chicago—Lakeside Motor Truck Transportation Co., capital stock $25,000, motor transportation business; incorporators, B. P. Dunlap, J. M. Dunlap, E. W. Macavoy.

Cleveland, O.—Marvel Auto Supply Co., capital stock, $5,000; to manufacture motor car accessories; incorporators, J. B. Rosenstein, H. L. Armington, M. L. Rosenstein, S. I. Rose, M. L. Fouts.

Cleveland, O.—Oldsmobile Co., capital stock, $50,000; to manufacture motor cars; incorporators, P. D. Metzger, C. H. Davis, J. J. Schmidt, C. L. Lampus, C. O. Nelson.

Cleveland, O.—Republic Electric Co., capital stock, $10,000; to manufacture and deal in electric machinery; incorporators, L. Griesser, O. S. Mann, G. S. Peskind, E. Marte, G. E. Mann.

Cleveland, O.—Pisco Mfg. Co., capital stock, $15,000; to manufacture lamps and motor car specialties; incorporators, H. G. Smith, J. C. Hipp, T. J. Smith, T. Lanness, D. Pfahl.

Cleveland, O.—Sixth City Machine Co., capital stock $10,000; to manufacture and deal in motor cars; incorporators, Ray C. Skeel, Charles M. Ringle, C. F. Bruggemeier, E. M. Becker, A. F. Goldenbogen.

Columbus, O.—Johnson Sales Co., capital stock $10,000; general motor car business; incorporators, W. J. Bennett, J. U. Pelton, A. D. Yetser, M. M. Johnston, J. M. Bennett.

Columbus, O.—Fresco Mfg. Co., capital stock, $15,000; to make and sell motor car lamps; incorporators, H. C. Smith, J. C. Hipp, T. J. Smith, T. Laness, D. Pfahl.

Detroit, Mich.—Farlinger Mfg. Co., capital stock, $30,000; to manufacture motor car accessories; incorporators, M. Friedburg, C. R. Talbot, W. H. Arthur.

Detroit, Mich.—Kessler Detroit Motor Car Co., capital stock, $10,000; to manufacture motor cars and accessories; incorporators, H. C. Brooks, Jr., R. McCormick.

Detroit, Mich.—Superior Motor Co., capital stock, $100,000; incorporators, H. Fraser, W. C. Schneider, G. C. Brimmer.

Des Moines, Ia.—Des Moines Motor Co., capital stock, $25,000; to deal in motor cars; incorporators, F.H. Hunter and C. F. Schee.

Harrisonburg, Va.—Harrisonburg Garage, capital stock, $25,000; incorporators, J. J. Hawse, H. L. Furn.

Hudson Falls, N. Y.—Kingsbury Motor Sales Co., capital stock, $10,000; to deal in motor cars; incorporators, L. Wetsell, E. H. Wells, E. I. Wells.

Indianapolis, Ind.—Tone Car Corp., capital stock, $200,000; to build motor cars; incorporators, F. J. Tone, M. H. Miller, W. P. Kirk.

Indianapolis, Ind.—Premier Agency Co., capital stock, $30,000; directors, V. C. Vette, D. E. Sherrick, T. H. Adams, W. H. Foreman, H. W. Cowper.

Jersey City, N. J.—Miller Supply Co., capital stock, $100,000; incorporators, J. A. Duffy, W. C. Marley, M. E. Thornton.

Mineola, N. Y.—Nassau Garage, capital stock, $1,000, incorporators, C. Kemlein, F. Kemlein, M. Kemlein.

Minneapolis, Minn.—Northwestern Tire Co., capital stock, $50,000; to deal in tires; incorporators, F. J. Kerner, A. A. Kerner, J. C. Roney.

Minneapolis, Minn.—Michaelson Motor Co., capital stock, $200,000; incorporators, J. M. Michaelson, W. E. Michaelson, A. E. Peterson.

Mount Vernon, N. Y.—Mount Vernon Motor Express & Van Co., capital stock, $6,000; incorporators, M. R. Fitzgibbon, C. C. Fitzgibbon, S. Laverde.

New York—Durable Tread & Automobile Sales Co., capital stock, $10,000; to deal in tires; incorporators, R. H. Jacobs, S. M. Winkler, H. A. Deimel.

New York—American Chain Co., capital stock, $750,000, to manufacture non-skid tire chains; incorporators, W. B. Lasher, W. W. Wheeler, F. T. Staples.

New York—Motor Mechanism Co., capital stock, $25,000; to manufacture motor cars and parts; incorporators, E. Younger, F. Castle, H. C. Evans, E. E. Gray, S. E. Sackerman.

New York—Garron & Co., capital stock, $20,000; to deal in motor cars; incorporators, A. L. Garron, H. Behr, K. H. Behr.

Richmond, N. Y.—K & K Motor Co., capital stock, $10,000; incorporators, A. E. Killian, F. B. Killian, L. E. Killian.

Richmond, Ind.—Pilot Car Sales Co., capital stock, $50,000, directors, J. E. Hayes, W. I. Schaer, H. E. Bradford, C. E. Hayes, W. Williams, E. F. Goggins, T. F. Williams.

Trenton, N. J.—Lord Baltimore Motor Car Co., capital stock, $100,000, incorporators, John Luntz, Jr., H. C. Nicholas, J. L. Chase.

Wilmington, Del.—Light Commercial Car Co., capital stock, $100,000; to manufacture and deal in motor cars.

Worcester, Mass.—Dixon, Walsh & Nicholson Co., capital stock, $1,000; to repair motor cars; incorporators, W. T. Walsh, A. T. Nicholson, J. Clark, Jr.

Worcester, Mass.—Slattery Brothers Automobile Co., capital stock, $10,000, directors, W. J. Slattery, M. J. McCoy, J. McGinnery.

to the managership of the Philadelphia branch.

Des Moines, Ia.—C. W. Bopp, formerly of Hawkeye, Ia., has opened a new sales room in Des Moines for the Nyberg.

Washington, D. C.—Frank W. Robartes has been appointed resident manager of the Washington branch of the Locomobile Co. of America.

Seattle, Wash.—A new firm has been added to Seattle's row, namely, the Auto-parts Supply Co., at 702 East Pike street. E. L. Hawkes is president and manager.

Portland, Ore.—A. G. Annesley is the new manager of the Diamond Rubber Co. in Portland, Ore., having recently been promoted from the San Francisco branch.

Toledo, O.—The Rapp Mfg. Co., maker of the Viso spark plug, will double its capacity about the middle of December. It will remove from the Snowflake building to the new Factories building, where it will utilize more than 2,000 feet of floor space. The concern has been in existence but 4 months.

Dayton, O.—J. W. Woodruff and R. W. Kuhns, formerly associated with the Peckham Motor Car Co., have resigned, and have taken the agency for the Wagenhals delivery car, controlling the central western section of Ohio, and will be known as the Kuhns Woodruff Co., located at 435 and 437 East First street, Dayton, O.

Indianapolis, Ind.—Warren D. Oakes has become associated with his brother, Will H. Oakes, in the manufacture of radiator fans in Indianapolis. The business of the Oakes company has been increasing so rapidly that this expansion has been necessary. Warren D. Oakes has been manager of the Kansas City branch of the Studebaker Corporation.

Columbus, O.—The Firestone Tire and Rubber Co. has opened a direct factory branch in Columbus, at 197-199 East Gay street.

Detroit, Mich.—The Abbott Motor Car Co. has appointed W. J. Leisaw as district sales manager for the states of Indiana, Michigan and Ohio.

Atlanta, Ga.—The H. W. Johns-Manville Co. announces the appointment of C. S. Berry as manager of the Atlanta office, at 31½ South Broad street.

Davenport, Ia.—The Neuman Machine Co., 308 East Second street, is to have a new two-story garage at Third and Ripley streets. The garage will cost $10,000.

St. Louis, Mo.—L. H. Mesker, manager of the St. Louis branch of Manning, Maxwell & Moore, Inc., has resigned his position and will be connected in a similar capacity with the Ferro Machine and Foundry Co., Cleveland, O.

Chicago—The Chicago School of Motoring, conducted by F. E. Edwards, chairman of the technical committee of the American Automobile Association, has moved from Michigan avenue to 1619 Wabash avenue, and the name changed to the F. E. Edwards Automobile School and College of Motoring.

Boston, Mass.—E. A. Buck & Co., makers of Powero gasoline, and Best oils, of Worcester, Mass., one of the independent companies, have added two new stations to their chain in Massachusetts by opening branches at Greenfield and Medford, covering both the eastern and western parts of the Bay state.

Findlay, O.—John Labadie has purchased the George Kersh garage at Ottawa and has leased the building for 5 years.

New York—Fay Morton Henkel, for 4 years the eastern manager of the Remy Electric Co., has joined the forces of the Ward-Leonard Electric Co.

Indianapolis, Ind.—George H. Lloyd, formerly with the Velie Motor Vehicle Co., has joined the sales force of the American Motors Co., of Indianapolis, Ind.

Des Moines, Ia.—The Paige Auto Co. is the name of the latest Des Moines motor company. K. H. Kooker, formerly with the Warren, is the manager of the new concern.

Boston, Mass.—The Metz Co., Waltham, Mass., has decided to open a branch in New York city that will be used as a station for feeding the cars to the middle Atlantic and western states.

Neenah, Wis.—The Bergstrom Motor Car Co. is rebuilding its headquarters into a modern garage at a cost of $10,000. The company has been occupying a former livery stable building as a garage for some time.

Milwaukee, Wis.—The Michelin Tire Co. of New Jersey is the latest tire company to establish a direct factory branch in Wisconsin. The corporation has filed articles and a statement to do business in Wisconsin, giving its capital stock as $3,000,000 and the Wisconsin interest at $25,000.

Recent Agencies Appointed by Motor Car Manufacturers

PLEASURE CARS

Town	Agent	Car
Ashton, S. D.	C. H. Gardner	Detroiter
Baltimore, Md.	International Mfg. Co.	Metz
Baltimore, Md.	Detroit-Baltimore Co.	Abbott-Detroit
Boston, Mass.	Nyberg Auto Co.	Nyberg
Boston, Mass.	C. B. Johnston Co.	Pullman
Boston, Mass.	C. B. Johnston Co.	Ames
Britton, S. D.	J. M. Kelly	Detroiter
Buffalo, N. Y.	Miller & Schulman Motor Car Co.	Moon
Brookings, S. D.	S. H. McCarl	Detroiter
Carpenter, S. D.	W. A. Hicks	Detroiter
Columbus, O.	Barr Motorcycle Co.	Franklin
Cedar Rapids, Ia.	Abbott Motor Co.	Abbott-Detroit
Cincinnati, O.	L. C. Denison	Abbott-Detroit
Cleveland, O.	Abbott Motor Car Co.	Abbott-Detroit
Columbus, O.	Snyder Auto Co.	Abbott-Detroit
Charleston, Mo.	Like Howlett	Moon
Chilton, Wis.	Hippe Motor Car Co.	Rambler
Chilton, Wis.	Hippe Motor Car Co.	Overland
Chilton, Wis.	Hippe Motor Car Co.	Buick
Des Moines, Ia.	Guarantee Motors Co.	Abbott-Detroit
Doland, S. D.	Doland Auto Co.	Detroiter
Davenport, Ia.	Scott Mercantile Co.	Abbott-Detroit
Des Moines, Ia.	Van Vliet Bradt Motor Car Co.	Moon
El Paso, Tex.	International Auto Co.	Abbott-Detroit
Eureka, S. D.	C. Vorlander	Detroiter
Erwin, S. D.	W. H. Schenck	Detroiter
Ft. Wayne, Ind.	Electric Supply & Fixture Co.	Abbott-Detroit
Gary, S. D.	Charles Eckhardt	Detroiter
Goodwin, S. D.	W. Rohweider & Son	Detroiter
Groton, S. D.	W. H. Cassels	Detroiter
Henry, S. D.	R. E. Hubbard	Detroiter
Huron, S. D.	J. E. Mattice	Detroiter
Hayti, S. D.	Carl J. Erickson	Detroiter
Huntington, W. Va.	Abbott-Detroit Motor Co.	Abbott-Detroit
Holyrood, Kans.	G. L. Baker	Moon
Kansas City, Mo.	MacDowell Motor Car Co.	Moon
Minneapolis, Minn.	MacArthur, Zollars, Thompson Co.	Marathon
Minneapolis, Minn.	Minnesota Motor Car Co.	Henderson
Milwaukee, Wis.	E. B. Leverenz	Pullman
Mediapolis, Ia.	Fleenor's Garage	Moon
Mystic, Conn.	Mistic Auto Station	Franklin
Marietta, O.	Jacob Spindler	Abbott-Detroit
New Orleans, La.	A. N. Kinch	Moon
Norfolk, Va.	Roethke Brothers	Abbott-Detroit
Oldham, S. D.	C. B. Jensen	Detroiter
Omaha, Neb.	Traynor Automobile Co.	Abbott-Detroit
Pierpont, S. D.	W. L. Almquist	Detroiter
Peever, S. D.	Victor Nelson	Detroiter
Piqua, O.	Meinders Garage	Franklin
Punxsutawney, Pa.	G. Frank Porter	Moon
Sisseton, S. D.	J. J. McCoy	Detroiter
St. Lawrence, S. D.	Carl Brothers	Detroiter
St. Louis, Mo.	Warren Motor Car Co.	Argo
Sterling, Ill.	Greenough & Pittman Co.	Abbott-Detroit
Sioux City, Ia.	John J. Keefe	Abbott-Detroit
Spokane, Wash.	Spokane Auto Truck Co.	Franklin
Troy, O.	Troy Auto Co.	Franklin
Washington, D. C.	David S. Hendrick	Abbott-Detroit
Wilson, N. C.	Wilson Motor Co.	Abbott-Detroit
Washington, Pa.	Washington Automobile Co.	Moon
Washington, D. C.	Barnard Motor Car Co.	Reo
Washington, D. C.	Barnard Motor Car Co.	Stoddard-Dayton
Yankton, S. D.	F. J. Nyberg	Moon

TRUCKS

Town	Agent	Car
Albany, N. Y.	Dominant Motor Car Co.	Stewart
Boston, Mass.	C. B. Johnston & Co.	Stewart
Chicago	Voltz Brothers	Stewart
Indianapolis, Ind.	Archey-Atkins Co.	Mais
New York	I. Sekine Co.	Adams
Pittsburgh, Pa.	Alco Pittsburgh Sales Co.	Stewart
Providence, R. I.	Portland Garage	Stewart
San Francisco, Cal.	S. G. Chapman	Stewart
Washington, D. C.	Davis D. Hendrick	Stewart

AS CARTOONIST SIDNEY SMITH VIEWS THE TRADE YEAR

United States Motor Co., the big holding corporation; the purchase of the Diamond Rubber Co. by the B. F. Goodrich Co.; the court decisions over the Dyer transmission patents and staggard tread patent. Many concerns have demonstrated their prosperity by increasing capital stock, and some new concerns have been put into existence that promise to be big factors in the industry from now on.

Million Cars Running

The year ends with more than 1,000,000 cars in operation in the United States, and it would seem that one could look for something like 300,000 to be added during the season of 1913. Of course, all of these cars were not made and sold in 1912, but it would not seem to be an exaggeration to place the 1912 output at something like 400,000 cars. This prediction is based on reports gathered in Detroit, which city it is claimed makes more than 50 per cent of the American product. Detroit made something like 187,000 cars in 1912, and it is thought that 1913 will see about 300,000 cars made in Michigan metropolis next year. Of this number Ford alone expects to more than double this year's output.

In the realm of the commercial car considerable progress is reported. A conservative estimate places the number of trucks and delivery wagons in use in the country at the present time at 50,000 as against 30,000 a year ago.

Taking the other side of the picture—the sporting angle—one finds that there has been considerable activity displayed, although perhaps not so much as in some of the other seasons. There has been less participation in contests by the manufacturers, but, on the other hand, the owners themselves have given considerable support to races and reliability runs. There were four big road-racing meets during the year and innumerable track races. There was no Glidden tour, but this was made up in many other ways.

Altogether one cannot help but be satisfied with 1912.

Active Year in American Motor Industry Reported

TRADE HAPPENINGS OF THE YEAR

Association of Licensed Automobile Manufacturers passes out of existence January 10, being succeeded by the Automobile Board of Trade.

United Motors' earnings for the last 6 months of 1911 announced to be $10,332,087.

United States census bureau, in January, estimates the 1909 motor products were valued at $249,202,000.

Rubber Goods Mfg. Co. announces its 1911 earnings to be $3,607,896.

In April Goodyear declares 100 per cent dividend on common stock and increases its capital from $6,000,000 to $15,000,000.

Marion Sales Co. is bought from the Willys-Overland Co. by John I. Handley.

Buffalo Electric Co., capitalized at $1,000,000, absorbs the Babcock electric and several other prominent makes.

In May the B. F. Goodrich Co. buys the Diamond Rubber Co. for $15,000,000 worth of 7 per cent preferred stock and $30,000,000 common.

Splidorf and Alvord interests merge as the Splitdorf Electrical Co. with a capital of $3,500,000.

Fire destroys the plant of the Lion Motor Car Co. at Adrian, Mich., in June, causing a loss of $400,000.

W. J. Mead resigns as general manager of the Olds Motor Works to become president of the Amplex Motor Car Co., of Mishawaka, Ind.

John N. Willys buys the controlling interest in the Garford Co. in July and later on takes over the Gramm truck plant.

In July the Cole Motor Car Co. absorbs the Henderson Motor Sales Co. and decides to market its own product.

The Henderson Motor Car Co. is organized in Indianapolis.

In August H. A. Lozier resigns as president of the Lozier company, being succeeded by H. M. Jewett.

F. H. Wheeler of Wheeler & Schebler buys the Mais truck plant and later in the year buys the interests of his partner, George Schebler.

United States Motor Co. is placed in a receiver's hands in September, with assets of $12,250,000 and liabilities of $15,300,000. Benjamin Briscoe resigns as president and W. E. Flanders is made general manager of the holding corporation.

During the fall months the manufacture of the Elmore and Marquette cars is discontinued.

United States circuit court of New York sustains the Mell patents in the suit of the Republic Rubber Co. against Morgan & Wright, but the United States court of appeals reverses the decision. The case has been appealed.

Validity of the Dyer transmission patents is sustained.

United States court of appeals decides against the Hartford in the Midgley tread suit.

Lovell-McConnell defeats the American Ever Ready Co. in Klaxon horn suit.

Judge Kohlsaat of the United States circuit court holds the Searchlight Gas Co. does not infringe Prest-O-Lite because of prior expiration of British claims.

Weed generally upholds its tire chain grip patent claims.

Decisions against the Knight patents are handed down in the case of Rolland-Pilain in France and the Argyll in England. Both cases have been appealed.

Louis Renault of France wins his suit sustaining the validity of the patents covering thermo-syphon cooling with a radiator dash.

Stewart-Warner Speedometer Co. buys the Stewart and Warner companies.

THE industry had a very active year, and there were many kaleidoscopic changes. A couple dozen concerns found it so hard sledding that they got into the courts; there are some new faces in the trade gallery as a result of the happenings of 1912, while the spring, summer and fall were marked by much litigation over patents pertaining to the motor car and its accessories.

The biggest deal of the year undoubtedly was the Goodrich-Diamond proposition, which started with the purchase of the Diamond by the Goodrich, which resulted in one of the most powerful tire making corporations in the world. All the tire concerns had profitable seasons, judging by the reports of dividends declared, and while the season was marked by rumors of big mergers and combinations, the Goodrich-Diamond was the only one of consequence that materialized.

validity of the Dyer transmission patents, five in all. The importance of this decision may be realized when it is known that immediately following the ruling of the court the Automobile Board of Trade arranged for manufacturing licenses for its members. These patents cover selective gearsets and direct drive epicylict gearsets the right to use the change plate.

The Weed Chain Tire Grip Co. fought a number of successful suits in the court to sustain the validity of the patents covering tire chains. There were at least a half-dozen decisions handed down in favor of the Weed company. Another accessory concern that was very successful in its legal battles was the Lovell-McConnell Mfg. Co., which controls the Klaxon horn. The Avery Portable Lighting Co. won its suit against the Milwaukee Bronze Castings Co. for alleged infringement of the patents for lamp reflectors. The Fisk company defeated the DeLeski & Thropp patent on tire forming apparatus. The United States circuit court of appeals decided against the Hartford Rubber Works in a suit involving Midgely tread.

Foreign Decisions

In the foreign courts the chief events of interest were the decision sustaining Louis Renault in the matter of thermo-syphon cooling with a radiator dash, and the Knight engine cases in France and England. A French court held that Rolland-Pilain did not infringe the Knight patents, while in an English court the Knight-Argyll suit was decided in the favor of the latter, but an appeal was taken.

Another innovation of the year was the salesmen's convention that was held in Indianapolis in the fall, which brought out 400 manufacturers and dealers who spent two days in discussing business methods. This meeting resulted in the forming of permanent organization for the purpose of holding annual meetings of this sort.

The Society of Automobile Engineers has made decided progress during the last 12 months. At the present time there are 1,441 members in the society, about one-third of whom came in during 1912. The work of the standards committee has been particularly praiseworthy, as is shown by the report of Secretary Clarkson as to the various matters under consideration, which are progressing somewhat as follows:

The aluminum and copper alloys division is considering recommendation of specification for gear bronze, no specification for which has been submitted heretofore.

Ball and roller bearing division still has in hand some matters, the most important of which is the tolerance from precise measurement.

Broaches division proceeding slowly in comparison with its past work on account of the increased use of splined shafts developing new methods of manufacture. The work of the division so far as squared and tapered fittings are concerned is in a very satisfactory condition.

Carbureter fittings division will make no further recommendations at present.

Frame sections division conducting very interesting work in the nature of collecting data as to average and good practice in the manufacture of frames.

Gear tooth shapes division contemplating an extensive series of tests in connection with the committee of the American Society of Mechanical Engineers and other scientific bodies.

Sheet metal division working in the matter of reducing the multitude of unnecessary gages. Will probably submit some data on phosphor bronze, manganese bronze, etc.

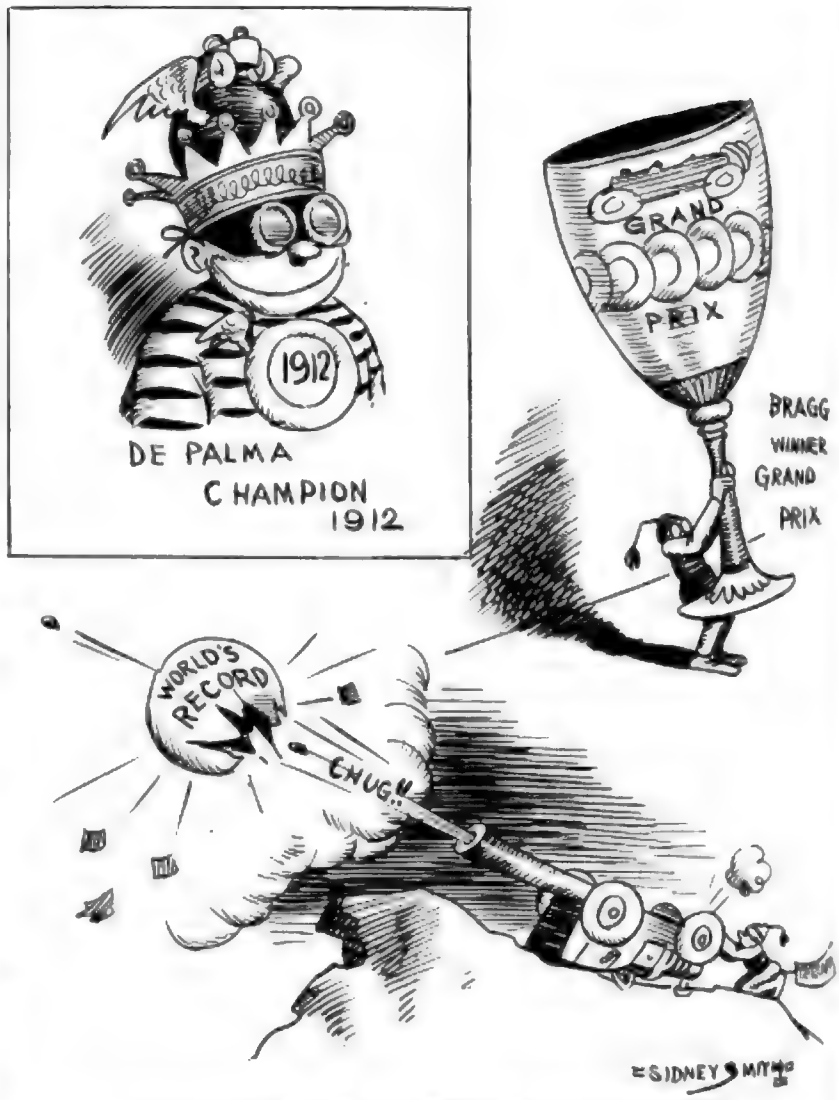
Motor testing division carrying on very interesting work of recommending standard methods and report forms of testing motors. Also leading up to joint work with the universities and the government in laboratory and research work.

Springs divison has in hand a report on leaf springs, recommendation of nomenclature in connection with the same, spring clips, shank thread, shrunk center bands and specifications for ordering springs.

Truck standards division taking up for consideration a large amount of detail data collected as to current practice in truck construction.

Wheel dimensions and fastenings for trucks division formulating a report on minor points supplementary to the establishment of the S. A. E. standard truck wheel and instructions as to the details of manufacture and inspection.

Motor car lighting systems considering points including wiring and insulation.



DE PALMA, BRAGG AND TETZLAFF THE RACING STARS

Shows Continue to Hold the Interest of the Public

SHOWS continue to enjoy a great popularity with the public, and 1912 saw no dearth of these exhibitions. The year opened with the usual national shows, there being two in New York and one in Chicago. In New York the Automobile Board of Trade, which succeeded to the estate of the Association of Licensed Automobile Manufacturers, promoted the show in the Madison Square garden, while the National Association of Automobile Manufacturers looked after the Grand Central palace affair. While these were two different shows, there was no great rivalry between the two great organizations, as shown by the fact that during the summer steps were taken to bring about a merger of the Automobile Board of Trade and the N. A. A. M. When the 1913 show question came up it was decided that the Automobile Board of Trade should handle both the New York shows, which should be one exhibition, although held in two buildings. The N. A. A. M. as usual, kept control of the Chicago show in the Coliseum and armory.

In Europe the late fall was marked by two big affairs, the Olympia show in London, and the Paris salon in France. The salon was not held in 1911, it being the intention of the French to abandon shows altogether. The British, however, refused to enter into any such pact, and the success of the Olympia that year was so great that the French were forced to reinstate the salon to its calendar.

Road Racing Makes Ralph de Palma a Champion

RACING

Joe Dawson in a National wins the 500 mile race on the Indianapolis speedway at 78.7 miles per hour.

Teddy Tetzlaff in a Fiat breaks the world's road record at Santa Monica, averaging 78.7 miles per hour.

Ralph de Palma in a Mercedes wins the Elgin free-for-all, and Elgin National trophy at Elgin and the Vanderbilt cup at Milwaukee.

Caleb Bragg wins the grand prix at Milwaukee.

Milwaukee promoters lose $43,000 on the Vanderbilt and grand prix meet.

Philadelphia's Fairmount Park road race is abandoned because of inability to get permission to use the course.

David Bruce-Brown killed training for Milwaukee grand prix.

French grand prix is won by Boillot in a Peugeot. Bruce-Brown and de Palma, Americans, disqualified for taking on fuel outside of controls.

RACING in 1912 flourished despite the attitude of many American manufacturers who kept aloof from the sport, leaving it up to the promoters to scare up entries as best they could. The promoters were forced to rely almost entirely upon free-lance drivers piloting foreign-made cars and to the sporting tendencies of wealthy owners who were willing to back famous speed merchants for the pure joy of seeing cars owned by them gather in the laurels, much as is the case of rich turfmen who in the past maintained racing stables.

Road racing had a fairly good year. True, there were not so many events as in the past, but the ones that were run were well handled, more people than ever were attracted in the role of spectators, fast time was made as a rule, and, best of all, there were few accidents and no fatalities in the actual contests, although death claimed that brilliant star, David Bruce-Brown, and his mechanic, Scudaleri, killed in practice at Milwaukee.

Twenty Road Races Run

There were twenty races run in all, as compared with twenty-seven in 1911. This meant in reality four meets—Santa Monica, Elgin, Tacoma and Milwaukee, each having its feature event and having class races in addition. Besides this there were three others that could not be classified in this category. The Bakersfield road race was not over a circular course; neither were the Los Angeles-Phoenix and the San Diego-Phoenix races. Those two were from town to town and more nearly approached races over country roads than any others.

The major classics, of course, were the grand prix and Vanderbilt at Milwaukee, and the free-for-alls at Tacoma, Santa Monica and Elgin. They brought about the success of foreign cars in every instance, de Palma and his Mercedes winning the Vanderbilt and the two Elgin events; Tetzlaff scoring at Santa Monica and Tacoma in a Fiat, and Bragg in a Fiat winning the grand prix at Milwaukee.

Financial success did not attend the efforts of the promoters of these classics. Milwaukee went into the hole to the tune of $43,000 because of bad weather conditions that prevented the Brewers from completing their course in time and forcing two postponements and a reconstruction of the course that ran up into big money. Elgin lost a little, but feels as if it really made money in that the continuity of the meets was not broken. The Chicago Motor Club abandoned the Elginites, and had it not been for the Chicago Automobile Club jumping into the breach there would not have been any racing over the Kane county circuit.

One of the classics was abandoned, the Quaker City Motor Club being unable to secure the use of the Fairmount park course, the commissioners taking a firm stand against road racing because of the fear of accidents. It does not look as if there is any chance of reviving the affair for 1913.

While the world's road racing record was broken in 1912, the average speed of the different events was much slower than that of the preceding season. Tetzlaff started the season by raising the world's average to 78.7 miles per hour in the Santa Monica free-for-all, but after that the pace slackened and nothing approaching that mark was reached during the season. The grand prix was won at an average of 69.3 miles per hour, the Vanderbilt at 68.9, the Elgin free-for-all at 68.9, the Elgin national at 68.4 and the Tacoma free-for-all at 65.8. The Los Angeles-Phoenix produced a new record in the 28.2 miles per hour made by Hamlin in a Franklin over a distance of 511 miles.

Dirt Track Racing

Racing on dirt tracks was well handled and this branch of the sport for 1912 can be classed as a decided success. There were more meets than ever before, there were no fatalities in any sanctioned event, and what few accidents that did occur did not amount to anything. Undoubtedly all this is due to the new rules brought out

OTHER CONTESTS AS VIEWED BY THE CARTOONIST

by the American Automobile Association, which are designed for the protection of the spectators, as well as the drivers. The features of these rules demand that the tracks be made dustless by oiling, that a danger zone be established which keeps the spectators at least 30 feet away from the track at turns, and gives the referee power to eliminate cars which he considers are not in racing condition. The record crop on the dirt tracks this year was a big one, Disbrow in the Simplex Zip landing most of the long distance marks, while Bob Burman in the Jumbo Benz dropped the mile mark to :46 at St. Louis.

Despite the fact that America has speedways at Indianapolis, Atlanta and Los Angeles, there was not much activity in this department. There was a small meet at Los Angeles following the Santa Monica races, while Indianapolis as usual staged its 500-mile race on Memorial day. The Hoosiers did not have as big an entry list as in the first year, but the contest itself was far more thrilling because of the sensational defeat of De Palma by Joe Dawson in the National.

The stock car had a sorry time of it this year because of the failure of the manufacturers to register with the A. A. A.

Road racing was revived in Europe during the year, and while there were not so many events as there were in the early days of motoring in Europe, still the French grand prix was a decided success, bringing out a field of 46 starters, which included 2 American drivers, Bruce-Brown and De Palma. The race was won by Boillot in a Peugot, who traveled the 956 miles at the rate of 68.7 miles an hour. The race was a two-day affair and there also was a class for 183-inch cars, which was won by Rigal in a Sunbeam.

LEGISLATIVE EVENTS

Happenings in Other Lines of Motor Sport in 1913

SPORTING EVENTS OTHER THAN RACING

American Automobile Association reinstates Premier company, suspended following the Glidden tour row of 1910.

Hupmobile globe-girdlers, who started from Detroit November 4, 1910, complete journey around the world January 15, 1911.

Frank Kulick in a Ford covers mile on the ice of Lake St. Clair at Detrot in :33⅘, equal to 109 miles an hour.

Warren-Detroit breaks the world's non-motor stop record, doing 12,406 miles at San Francisco.

Fuel economy test of the Quaker City Motor Club at Philadelphia is won by an American.

The Glidden tour is abandoned because of a lack of entries.

Kulick in a Ford wins the Algonquin cup in the Chicago Motor Club's annual hill-climb.

Chicago Motor Club promotes sensational reliability around Lake Michigan; with the Moline and Staver winners. Other reliabilities of the year include the St. Paul-Winnipeg, Iowa's Little Glidden, Farm and Ranch tour in Texas and the Buffalo club's event.

Erle in a Benz climbs Gaillon hill in France at the rate of 101.5 miles per hour.

Laurens A. Enos of Buffalo is elected president of the American Automobile Association, succeeding R. P. Hooper.

SPEED events filled up most of the contest program of 1912. There were few r liability events, still fewer hill climbs and only one fuel test. The trend seemed to be toward non-competitive affairs, and in this department a signal success was scored in that there were hundreds of so-called sociability tours which lacked competitive features, except that the cars were required to run on a blind schedule, the winners being decided by giving the prizes to the ones coming closest to the unknown time.

One of the other features of the year was the team match, a Chicago idea which has been in vogue in the Windy City for the last 5 years and which has aroused great interest among private owners. This contest is designed to bring out club spirit and the contestants compete more for the glory of the organization they represent than they do for individual honors. There were four of these matches in Chicago last summer, the Chicago Athletic Association twice defeating the Chicago Automobile Club; the Chicago Motor Club defeating the Illinois Athletic Club, while the Chicago Motor Club trade versus amateur match was abandoned after 1 day's running because of the inclemency of the weather.

There was no Glidden tour in 1912, the first time that classic has been given up. The American Automobile Association decided early in the season to hang up a main trophy to be called the National cup, which was paid for by popular subscription. It also decided to run the tour from Detroit to New Orleans, and the trail was blazed by an electric. Somehow the owners who were expected to support the tour failed to enthuse over the proposition and entries were so scarce that the American Automobile Association was forced to abandon the classic. Charles J. Glidden, donor of the famous cup, which has been the main prize up to this year, was not to be denied, however, and following the abandonment of the big tour he and a few of his friends made the trip from Detroit to New Orleans on the schedule laid out by the A. A. A. pathfinder.

Reliabilities of the Year

There were not more than three or four real reliability runs during the year. The Chicago Motor Club as usual led with a bold scheme, a tour around Lake Michigan, which lead through country that is practically unknown to the motoring world. This proved to be a decided success and evolved as winners two Molines in the roadster class, and the Staver in the touring car division. This was a non-stock run, as were all others during the season. An unusual affair was the reliability run for Texas ranchmen, which brought out a big entry list and stirred up great interest in motoring and road improvement among the farmers of the Lone Star state. Iowa kept its annual little Glidden on the calendar, a 5-day contest, which, however, lacked the usual big entry list. The Twin Cities staged a run from Minneapolis to Winnipeg and back.

There were not so many stunt performances during the season, the chief one being the run of an Alco truck, which was driven from the Atlantic to the Pacific ocean, thus earning the honor of being the first commercial motor vehicle to carry a load of merchandise across the country. Earlier in the year another Alco truck was put through a non-motor stop run at Philadelphia, going 336 hours without a motor stop, covering 922 miles, making 198 trips and 1,284 stops. The Warren Detroit figured in a non-motor stop run, also breaking the record by traveling 12,409 miles under the supervision of American Automobile Association officials. Another event out of the ordinary was the Frank Kulick in a Ford, who traveled 1 mile on the ice of Lake St. Clair at Detroit in :33 2-5 or an average of 109 miles an hour.

In Europe the feature of the hill climbing season was the performance of Erle in a Benz, who won the Gaillon climb at the rate of 101.5 miles per hour.

Motor Legislative Matters

LEGISLATIVE

New Jersey decides to establish reciprocal registration relations with other states.

New York state attempts to pass a bill requiring makers and dealers to stamp the date of manufacture on all tires sold in the state.

Minnesota's new law goes into effect, requiring registration every 3 years and specifying a reasonable and proper speed limit.

Massachusetts court decides it is illegal for vehicles to pass street cars on the right.

Many cities legislate against the use of the muffler cut-out, insist on universal lights, require an abrupt warning signal and rule against smoking cars.

BECAUSE of there being so few legislatures in session in 1912, there was not much doing in a legislative way. The one big feature of the year was the act of the New Jersey legislature, which finally granted reciprocity to other states. It took a long battle to bring this about, and the measure became a law only after the bill had been so amended as to raise the rates of registration 50 per cent, giving New Jersey an added revenue of about $200,000 a year from motorists. New Jersey for many years held out against this reciprocity clause, but public sentiment finally forced the legislature to capitulate. There are few states in the union now that are not in the reciprocity class. Texas, Tennessee and Maryland are in this category, but it is expected that before the end of another year it will be possible for motorists to go into any state without the necessity of registering, providing they carry the tag of their own state.

Few Decisions Rendered

Also there were few decisions handed down by the courts that had much effect on the legal status of the motorists. Probably the most sensational verdict of the year was the decision of the Massachusetts supreme court last month, which held that although the rules of the road permit of it, it is illegal for any vehicle to pass to the right of a street car, no matter if the street car is moving or if the tracks do not permit the passing to the left.

Another bit of legislation was the attempt made in New York state to compel motor car manufacturers and dealers to stamp the date of manufacture on all tires sold in that state. There is a similar law in Minnesota, but it is a dead letter. The New Yorkers, however, made a vigorous fight and succeeded in killing the bill.

Next year will be a busy one in legislative circles, for nearly every legislature in the country will be in session. Motorists, however, do not anticipate many radical bills. The farmers who now are strongly interested in motorists, weild too much power to permit of any legislature to run him up among the motor laws. It is most likely that the motorists themselves will bring about several needed reforms. There seems to be an insistent demand that all vehicles carry lights at night, and in many states there will be demands made for laws that will compel drivers of horse-drawn vehicles to show lights just the same as do the motorists. The motorists also feel that car stealing is regarded as too much of a joke by the courts and undoubtedly there will be laws which will give the judges power to send a car thief to jail instead of fining him. It is felt that if the stealing of a motor car is put on a par with horse stealing and vigorous punishment meted out, joy riders and chauffeurs will be more careful about taking out the car without the permission of the owners.

AMONG GOOD ROADS WORKERS

Highway Improvement

GOOD ROADS

Carl Fisher and J. A. Allison of Indianapolis ask the motoring interest to subscribe a $10,000,000 fund for the purpose of buying material with which to construct a trans continental route.

New York decides on a $50,000,000 bond issue.

United States census bureau reports that in 1909 this country had a total mileage of 2,199,645 miles of public road of which 190,476 were improved.

American Automobile Association does valiant work in promoting the campaign for federal aid.

Canada and Mexico show commendable activity in the good roads cause.

Many good roads conventions are held during the year.

THERE was great activity in the ranks of the great army that is working for the betterment of the American highways. While there are no big milestones marking the progress made by the good roads enthusiasts, still it is felt that the cause had been given a big impetus. There were many good roads conventions held during the year, not only by the motoring interests, but by others as well, while the American Automobile Association kept hammering away at the federal aid proposition until now it looks as if some action will be secured at the convening of the new congress early next year.

In nearly every state in the union good roads organizations were formed. Usually the motorists were the ones to start the agitation, but they found that they had most valuable allies in the shape of farmers, who are thoroughly aroused to the need of improved highways and who are giving the motorists every assistance possible in securing legislation that will bring this about. The recent road congress at Cincinnati brought together a vast army of workers, and while no specific results were obtained as a result of the meeting, it is evident that the army is gaining so many recruits that before the end of another year it will be so powerful that legislatures will have to sit up and take notice.

Activity in General

Iowa, as usual, has kept hammering away for good roads and the season of 1912 has added to the mileage in the Hawkeye state. Colorado has at last realized what a valuable asset it has in its rugged scenery, and the "nation's playground," as it is termed, has come into great prominence within the last few months. In Canada there also is much activity. The authorities are giving the movement all kinds of support and only recently the Canadians succeeded in blazing a trail from Halifax to Vancouver, the first trans-continental trip made in the dominion.

The feature of the year in good roads circles was the proposition sprung by Carl Fisher and J. A. Allison, of Indianapolis, who started a movement to raise a fund of $10,000,000 with which to buy material to build an official trans-continental route that would be ready for the motor traffic of 1915, when the Panama exposition will be held on the Pacific coast. The Fisher-Allison proposition calls for those in the motor industry to subscribe one-third of 1 per cent of gross profits for 3 years and at last reports the Hoosiers had succeeded in securing pledges for more than $1,000,000.

New York Turns a Trick

New York has enacted legislation during the year which has helped the good roads cause considerably. In April the assembly passed the Murtaugh bill, which gives $50,000,000 for road improvements, while the last national election resulted in the approving of a $50,000,000 bond issue for highways in the Empire state.

During the year the United States census bureau gave out a report which showed that in 1909 the total mileage of all public roads in the United States was 2,199,645 miles, of which 190,476 miles were improved roads.

Stewart-Warner Merger Completed

New Speedometer Company Formed Which Buys Interests of Two Big Concerns and Capitalizes as Virginia Corporation to Carry on Consolidated Business—J. K. Stewart to Head Enterprise—Other Trade Happenings

CHICAGO, Dec. 23—The Stewart-Warner Speedometer Co., a Virginia corporation of $11,000,000 capital, has just been formed and has purchased the plant and patents of the Stewart & Clark Mfg. Co., Chicago, manufacturer of the Stewart speedometer, and also the plant and patents of the Warner Instrument Co., Beloit, Wis. This new company has $1,000,000 preferred stock and $10,000,000 common stock. Although not officially announced, it is understood that J. K. Stewart, president of the Stewart & Clark Mfg. Co., will be president of the new organization. Headquarters will be in Chicago. The deal was closed Saturday.

The physical properties of the Stewart and Warner companies will be continued as at present, that is, the Stewart & Clark Chicago plant and the Warner-Beloit plant will continue manufacturing the same class of speedometers that they have in the past and marketing them under their respective names. There will not be any change in the management of these plants or in the selling organizations.

This purchase of the two companies brings the control of all speedometer patents held by each company under a single control, and so the long-drawn-out litigation on the subject of magnetic speedometers between the two companies is brought to a close. A decision had been looked for from the courts for many months.

The purchase of these two companies in the closing days of the year comes as a climax of a series of unions of this nature in the motor industry, the biggest previous one during the year being the Goodrich-Diamond deal.

New York, N. Y., Dec. 24—A Warner-Stewart official announcement has been made that J. K. Stewart is to be president of the new corporation, but the remainder of the officers have not been selected. C. B. Smith will be general manager.

The suit now pending in the United States district court, southern district of New York, has not been dismissed. Announcement has been made, however, on the part of Stewart & Clark that the principle involved in the patent in question is not important to modern practice and the changes favor a dismissal because of the problematic value of a decision on a point not involved in present manufacture.

STROMBERG SUES ZENITH

Chicago, Dec. 24—Announcement was made here today by the Stromberg Motor Devices Co., maker of Stromberg carbureter, that it has filed suit in the United States federal court, eastern district of Michigan, Detroit, asking that an injunction be granted prohibiting the Zenith Carbureter Co., Detroit, maker of the Zenith carbureter, from manufacturing carbureters claimed to be infringement of two patents held and owned by the Stromberg company.

One is the Ahara patent granted in 1901, which contains claims on a carbureter without moving parts; and the other is the Richard patent which covers a U-shaped tube in a carbureter in certain relation to the gasoline supply, one end of the tube extending into the mixing chamber and the other exposed to the atmosphere, combined with other features essential in modern carbureters.

The Richard patent was granted in 1905. The Stromberg company claims that the Ahara patent describes a carbureter which has the same mode of operation as used in the Zenith, giving proper mixtures of air and gasoline by automatic control, and without the use of moving parts.

V. R. Heftler of the Zenith company, interviewed in Detroit, states that the suit will be fought and that there is no ground for action. The Detroit attorneys for the Zenith company will be William M. Swan of the firm of Keena, Lightner, Oxtoby & Oxtoby. The services of the prominent patent attorneys, Bigwell & Barnes of Pittsburgh, who have attained prominence through their handling of patent litigation for the United States Steel Corporation, also have been secured by the Zenith company, which has not yet made any plans for its line of defense, as it is very difficult to determine the exact status of the matter until the taking of the first testimony, the bill of complaint having the usual vagueness, it is claimed.

FORD MAKES ANNUAL STATEMENT

Detroit, Mich., Dec. 23—According to the balance sheet for the fiscal year ending September 30, just issued by James Couzens, secretary and treasurer of the Ford Motor Co., the assets of the company at the end of the year amounted to $20,815,785.63, of which $6,400,100.66 represented cash on hand and in banks. Other items included in the assets were:

Michigan municipal tax exempt bonds at cost, $1,075,051.48; accounts receivable, $230,912.17; merchandise inventories at cost, $6,029,533.83; other investments, $7,772.04; prepaid expenses, $44,591.07; real estate, $820,636.97; buildings and building fixtures, $2,596,115.61; factory equipment, $371,110.90; office furniture and fixtures, $58,059.39; power plant, $301,166.13; machinery, $1,542,860.89; tools, $506,510.17; patterns, $66,884.00; machinery, tools and equipment at branches, $52,746.30; patents, $51,793.96.

Included in the liabilities were: Accounts payable, $2,201,026.63; accrued pay rolls $149,166.45; accrued salaries, $12,337.43; accrued expenses, $178,766.10; contract rebates, $58,350; reserve for refunds to take care of reduction in price, $75,000; reserve for employes' bonus, $242,033.80; reserve for bad debts, $3,655.04; reserve for depreciation of fixed assets, $742,626.89; reserve for depreciation of patents, $51,793.96; reserve for fire insurance premiums, $11,900.40; reserve for unearned profits, branches, $284,043.34; capital stock, $2,000,000; surplus, $14,745,963.37; total, $20,815,785.63.

PITTSFIELD FORMS ALLIANCE

Dalton, Mass., Dec. 23—The reported rumors of an alliance between the Western Electric Co. and the Pittsfield Spark Coil Co. have been officially confirmed by both parties concerned. Under the arrangement between the two companies the entire line of Pittsfield products, including magnetos, spark coils, spark plugs, timers and switches are now to be marketed exclusively by the Western Electric Co., under the name of Western Electric-Pittsfield. For a while the Pittsfield company will continue to sell some magnetos direct. It is understood that beginning January 1 a sales campaign will be launched covering the entire line of Western Electric-Pittsfield devices, which has been materially extended to take care of the allied business. The sales efforts of the Western Electric Co. will be directed largely towards manufacturers and supply houses. Ample stocks will be carried at each of the twenty-eight Western Electric distributing houses, located at shipping centers throughout the country.

NEW TRUCK COMPANY ORGANIZED

New York, Dec. 23—The American Motor Traffic Co., incorporated under the laws of South Dakota, was formally organized in Washington, D. C., on December 18, where it will occupy the fourth floor of the new Citizens' Bank building at 1421 G street, N. W. The directors of the company are: E. S. Alvord, president; E. J. MacFarren, first vice-president and acting manager; W. J. Moore, second vice-president; A. L. Kley, secretary.

The company will specialize in heavy-duty commercial motor vehicles of the pivoted spindle, multiwheel drive and steer type with flexible load suspension and balance and also in liquid fuel combustion engines and vehicle accessories. Many other features of improvement in vehicle construction are said to be controlled by the company under various patents granted to MacFarren, Thomas and others and further protected by special trade marks.

CHALMERS HOLDS GINGER NIGHT

Detroit, Mich., Dec. 21—Gathering together salesman, traveling men, district managers and officers in 300 cities and towns throughout the United States the

Chalmers Motor Co. Monday night celebrated "ginger night." At 7:30 o'clock or earlier in all these places simultaneous meetings of the Chalmers dealers and their organizations were held.

At the same time a banquet and meeting of heads of departments and other officials of the factory organization was held in Detroit. Throughout the evening the central meeting in Detroit was in telegraphic touch with the other ginger meetings throughout the country.

"Ginger night" was conceived and planned by the Chalmers sales department for the purpose of stimulating the dealers and their salesman everywhere to even greater enthusiasm in the sale of the Chalmers cars. It was decided that by selecting one evening and arranging to have all dealers and their men concentrating their thoughts on sales promotion at that particular time the greatest enthusiasm or ginger could be instilled into the men in the field.

Announcements of the plan were sent out long in advance. Letters from Mr. Chalmers, bulletins and notices of various kinds served to interest the dealers in the plan and everywhere Chalmers dinners were given and meetings held. Regular programs of discussion were arranged, in which every phase of motor car selling problems was discussed.

Reports of these meetings telegraphed in to the factory meeting indicated the greatest enthusiasm everywhere. At the central meeting in Detroit all the talks made by the officials and department heads of the Chalmers company were along the lines of ginger. Various definitions of ginger and ginger night were given.

DE TAMBLES AFFAIRS DISCUSSED

Indianapolis, Ind., Dec. 23—Creditors of the De Tambles Motors Co. met in Anderson, Ind., on December 18 with H. C. Sheridan, referee in bankruptcy. An offer had previously been made to settle at 10 cents on the dollar, but it was thought best to examine the bankrupt before taking final action on the offer. An appraisement shows the assets are $145,000 while the liabilities are about $233,000, which includes $133,000 in bonded indebtedness. There is about $100,000 in open accounts. A settlement has not been agreed on thus far.

RECEIVER FOR MATHESON

New York, Dec. 23—Following a meeting of stockholders and creditors of the Matheson Automobile Co. in Wilkes-Barre, Pa., at which it was petitioned that a receiver be appointed for a short term, Judge Witmer, sitting at Wilkes-Barre, Pa., and Judge Holt at New York, named William C. Shepherd, president of the Matheson Automobile Co., as receiver in equity. The reason given for the receivership is that the company is unable to meet its maturing obligations. Liabilities are estimated at about $600,000 and assets as shown by the company's books, about $1,000,000.

L. L. Lewis, counsel for the reorganization committee of the Matheson Automobile Co., and J. N. Rosenberg of Rosenberg & Lewis, counsel for the Bosch Magneto Co., and the creditors' protective committee, have issued the following statement:

A plan of financial readjustment was prepared about a month ago which has met with the approval of about 80 per cent of stockholders and 60 per cent of creditors. Pending completion of the plans of reorganization it was found advisable to apply for a short term receivership. Co-operating with Mr. Shepherd, president and receiver for the company is a creditors' committee consisting of G. Jahn, treasurer of the Bosch Magneto Co.; H. P. Jones, president of Phineas Jones & Co., and E. S. Fretz, president of the Light and Foundry Co. The outstanding capital stock is about $2,500,000.

The nominal assets of the company are estimated at $1,000,000 and the liabilities are placed at $600,000. It has been announced that the receivership is to be very brief, extending over a period of only about 3 wees. It is friendly in its inception and was intended, according to the announcement, to stave off insistent creditors until the plans for refinancing the company are perfected. The company made sharp retrenchments at the time of the reorganization and has done a good business since then. According to statements from the company, its basic condition is good and the legal steps resulted from a temporary lack of capital coming at the height of the non-productive season.

LION SALE POSTPONED

Detroit, Mich., Dec. 23—As the highest bid for the property of the Lion Motor Car Co., of Adrian, Mich., was too low, Referee in Bankruptcy Lee Joslyn has postponed the sale to December 24. The property was appraised at $33,401.73 and the highest amount offered at the sale at Adrian was $7,000. Referee Joslyn thereupon postponed the sale. After the sale the creditors will elect a trustee.

UTAH TACKLES USED CAR PROBLEM

Salt Lake, Utah, Dec. 21—The Utah Automobile Trades Association is the name of a new association which has just been organized in this state to protect dealers from some of the evils which have grown up in the trade. The new organization has opened an office at 251 State street, in this city, with a manager in charge to take care of its business. The question of credits will be handled through a credit bureau within constant telephone communication with all its members. This will be of special benefit to the garages who are at present victims of the man who owns a motor car and depends upon his "front" to get his repairs, gasoline and oil on credit.

The second-hand car situation will be handled by dealers in this manner: Whenever an offer is made on a second-hand car by any member of the association, this offer is immediately telephoned to the central office of the association. Such information is confidential, but in case the party wishing to dispose of his car goes to another dealer such dealer can find out by telephone just how much has been offered on this particular car, although the name of his competitor is not given. In this manner dealers are at all times protected from persons going around and getting dealers to bid against each other by inflating the price which he has been offered. The cut rate and consumers' league schemes, so much seen these days, will also be handled by cutting off the source of supply.

The new association is composed of all the larger concerns in the state and nearly all of the smaller. It will not attempt to regulate the greater evils of the trade, such as price cutting, at first, but hopes to later on.

GRABOWSKY SALE POSTPONED

Detroit, Mich., Dec. 23—Referee in Bankruptcy Lee Joslyn has postponed the sale of the property of the Grabowsky Power Wagon Co., adjudicated bankrupt about a month ago, until Thursday. When sealed bids were opened at the office of the referee today only two offers were received. One bid was from the Joy Realty Co. of Detroit, which bid $137,300 for the real estate, machinery and equipment, which were appraised at about $188,600.

The other offer was from Wintermitz & Co. of Chicago, which offered to take the property, with the exception of the real estate, and sell it for a commission of 12½ per cent, guaranteeing to net $55,000. The total, under the two bids, would be less than $175,000. It is believed, and Referee Joslyn is confident, at least $200,000 can be realized, which would give the creditors 50 cents on the dollar.

IOWA ADOPTS ROAD PROGRAM

Des Moines, Ia., Dec. 23—Four hundred delegates, representing every county in Iowa, adopted the best organized good roads program ever attempted in the state this week at the annual meeting of the Iowa Good Roads Association. As adapted by the convention the program will ask the coming state legislature for a 1-mill tax levy, a road bond issue and permanent state highway commission and the compulsory dragging of dirt roads.

Permanent roads carried the convention by storm and there was little dissension between delegates as to the need of centralizing good roads campaigns on the permanent road feature. Governor Carroll, who was kept from the convention by sickness, sent a report by President Lafe Young that he would, in his annual message to the Iowa legislature, ask for state aid for permanent roads.

SARGEANT CHANGES

Indianapolis, Ind., Dec. 23—On January 1, Charles E. Sargeant of Anderson, Ind., who has been mechanical engineer for the Remy Electric Co. and American Rotary Valve Co., of that city, will become chief engineer for the Lyons-Atlas company of Indiana.

is combined with a tap shutting off this supply of oil when the ignition is switched off. When the motor is running the pump delivers oil first to the dashboard tank, from which it is driven under pressure to the bearings.

These two supplies, sump and dashboard, give a total quantity of about 2 gallons of oil. It never is necessary to pour oil into the crankchamber. When renewing, the combined switch and oil tap is turned until the correct quantity of oil has flown into the sump, as indicated by the level tap: the dashboard tank is then filled. Berliet has a very neat method of indicating the quantity of oil in the sump. The usual type of float is fitted in the crankchamber, but instead of its stem being brought straight through the crankchamber, as is usual, it is brought up to operate in front of a graduated scale on the dashboard.

Forced Feed Lubrication

Forced feed lubrication is a strong feature of the cars at the Paris salon. There are two main methods of carrying this system out, and they are about equally represented. In the first the oil is delivered to the main bearings, to the connecting rod ends, and some times to the wrist pins, under pressure. In the second case only the main bearings are fed under pressure with troughs for the connecting rod ends. The two methods are about equally employed.

There is not much variety in the amount of pressure employed in the oiling systems. On an average it stands about 20 pounds to the square inch and varies from 7 or 8 pounds to as high as 50 to 60 pounds. There is a tendency to oil the camshaft bearings under pressure, as is done by Unic, or to provide a separate housing for the camshaft in which a constant level of oil is maintained, as on the Chenard Walcker cars. In a few cases provision is made for oiling the valve springs and guides. This is done on all the Unic models for the coming season, there being an oil hole from the crankchamber to the valve stem chamber, a raised front edge to this chamber to prevent oil overflowing, and an oil tight valve stem cover.

Bianchi's Methods

Bianchi adopts a similar method, the crankchamber being built up around the base of the cylinders, which are a block casting on all types, and a clear opening left from the crankchamber into the valve stem chamber. The valve stem cover is held down on a series of bolts, there being a paper gasket between the cover and its seat. With this design the valve springs are working under the same protected conditions as any other part of the internal mechanism of the motor. On the newest model Panhard provision is also made for a certain quantity of oil to escape from the crankchamber into the valve stem chamber.

France Picks Amiens for Grand Prix

Road Racing Classic to be Run Over Course 80 Miles North of Paris—Circuit Shortened to 19 Miles—Small-Car Event Postponed Until Middle of September

PARIS, Dec. 14—Next year's French grand prix road race will be run on a 19-mile course 2 miles to the east of Amiens and 80 miles north of Paris. An official announcement regarding this course will be made next week, but from reliable inside information it is possible to definitely announce that the Amiens course will meet with the entire approval of the racing board of the French club.

Amiens, a flourishing town of more than 90,000 inhabitants, a large proportion of which are interested in the cloth and woolen trade, is on the main railroad line from Paris to Calais, with a railroad station on the main line within a couple of hundred yards of the point where the grandstands will be erected. It is within 80 minutes of Paris by rail, 3½ hours of London, and within easy reach of the Belgian frontier. The town can provide all the accommodation necessary for a big crowd of spectators.

To Use Short Course

The 19-mile course is the shortest ever adopted for a speed contest in France, and is of such a nature as to provide a most spectacular display. The starting point will be about 2½ miles from the city of Amiens, but visitors from Paris will be set down by train within a stone's throw of the stand.

Roughly the course is triangular in shape, the first leg being a dead straight line 8 miles in length, of an undulating nature and with only one small village on it. This is an ideal speedway, being one on which the cars can be run with wide open throttle from beginning to end. A sharp turn to the right takes the cars on the second leg of the course nearly 3 miles in length, all of it being straight and level with the exception of the last few hundred yards, which are on a slight downgrade into the village of Moreuil.

The third leg measures a little more than 8 miles of a very wide and slightly winding national highway which twice passes under the main railroad line from Paris to Calais. There are rather difficult turns under the bridges. During the last ½ mile the road is parallel with the first leg of the course, the distance between them being so slight that the whole of the land between the two roads has been secured by the racing board and will be used for grandstands and pits. Spectators within this space therefore will see the cars approaching on the national highway, watch them go round the bend, and see them disappear on the fastest portion of the course.

It is proposed, instead of taking the cars right down to the fork, to build a special cross country road uniting the two parallel portions of the course. This will make it possible to provide an easier bend and one which, on being banked, can be taken at speed, thus adding to the spectacular nature of the race.

Up to the present year the Automobile Club of France has been afraid to hold a race on a short course, with the result that the events have been rather lacking in interest from the standpoint of the spectator. Partly as the result of experience gained at Dieppe, and partly because of the American examples of short courses, it was decided that the 1913 race should be over a circuit not more than 25 miles round.

The Amiens set of roads being only 19 miles round, are ideal, for they will not only add considerably to the interest of the race for the spectator, but will make control a much easier matter. This is an important matter in view of the fact that this race will be run on a limited fuel allowance. It is intended to run special trains direct from Paris to the grandstands at an inclusive price, the railroad ticket giving admission into the stands. There will also be special fast services from London in 3½ hours.

At the present time there are sixteen cars for the French grand prix race. These are three Sunbeams, three Peugeots, two Delages, one Mathis, three Italas, one Opel, and three Schneiders, the nations represented being England, France, Germany and Italy. Final entries close at the end of the year, by which time it is expected that there will be thirty five to forty cars on the list.

Many Entries Expected

It is understood that Mercedes will enter a full team, and it is most probable that Fiat and Benz will come in at the last moment. Other firms having the matter under consideration are Motoblos, Piccard Pictet, Alcyon, Lorraine-Dietrich and Mors.

It is practically certain that the French grand prix will be held during the last week of June or the first few days of July. The 3-liter race, originally fixed for Sunday, June 29, will be postponed until the middle of September in order to give manufacturers an opportunity of taking part in both races and to avoid clashing. The place for the 3-liter race has not yet been fixed.

It is expected that the town of Amiens will vote a subvention of $10,000 for the French grand prix. Last year's race cost over $60,000 to organize and left the racing board with a deficit. With the shorter course and the plentiful means of access it is believed that the Amiens course can be made to show a balance on the right side.

Chicago Show to be Palace of Glass

Decorative Scheme to be Radical Departure from Past Practice—Cathedral Effort to be Secured—Huge Painting will be One of Features in Coliseum—Electrics in Armory

CHICAGO, Dec. 23—The management of the Chicago show, held annually in the Coliseum and First Regiment armory and scheduled for February 1 to 15, 1913, has mapped out its decorative scheme. Both of the buildings will be decorated in a manner never before attempted in any exposition building, and, to accomplish this result, the management will make use of material previously used only in connection with the Chicago show and then only in an experimental way.

Strangely enough the New York show management has hit upon a name for its scheme, which, but for that fact, would have been applied at Chicago. It is to be known as the Crystal palace. The plans nevertheless will be entirely dissimilar. The Chicago plan will run to cathedral glass and stained window effects rather than to crystal.

Ornate Effects Expected

The extremely ornate effects which have been such marked features of the center of the Coliseum in the past will give way to more imposing overhead effects. The principal features of the decorative scheme will be found in the ceiling and on the balcony front. Extending from side to side and end to end, completely enveloping roof, girders and every particle of the overhead construction of the building, will be a gorgeous painting of which the principal features will be twenty-six stained glass windows, each 22 feet square. Each window will be of a separate design, in each case a reproduction of some classic work of art. These will be so brilliantly illuminated as to stand out in strong contrast with the remainder of the ceiling, and this despite the fact that the entire building will be as brilliantly illuminated as heretofore. Tests of the scheme already made in the building go to prove that the effect will be the most remarkable of its kind.

Rural Scenes in Balcony

The balcony front, a length of 1,000 feet and to a depth of about 10 feet, will be similarly treated, but the pictures will be rural scenes. There will be three of these in each of the twenty-six sections between the girders of the building. All of the pictures will be framed in massive settings, forming a scene at once impressive, dignified and pleasing.

Beneath the balcony the walls will be paneled in mahogany frames inclosing plate glass mirrors, which will be used extensively also in the ceiling above them. It was from this feature that the show might have properly taken the name of the Crystal palace. Mirrors will be used in profusion, though care has been taken that they shall not offend good taste. In addition to the walls and ceiling they will adorn massive posts erected below the balcony to disguise the iron girders which support the roof and gallery. These columns will, of course, be ornate and in keeping with the scenes above them.

Simplicity will mark the decorative feature in the center of the building and simple lighting effects will be the predominating feature. Ornamental posts will mark the dividing lines of the spaces and each post will support a cluster of perfectly white 12 and 15-inch electrically lighted globes, designed rather for ornament than illumination. Somewhat similar posts will support the exhibitors' signs, which will be of the same general effect as the windows in the ceiling and on the balcony front and will, of course, be illuminated from the inside and will furthermore be encased in white globes similar to those at the dividing lines. The dividing lines of the spaces, at the aisle front, will be marked by ornamental pillars, each bearing a sign denoting the name of the product of the space occupant.

Other parts of the building will receive equally careful attention. The annex will be completely dressed in new material, one feature of which will be the mirrored panels of the posts and walls. The effect of these, as shown by experiment, will be to give the building an appearance of greater size as well as beautifying the surroundings.

Decorations in Armory

Particular attention is to be paid to the decoration of the armory this season because of the fact that the makers of electric vehicles voluntarily relinquished their claim to space in the larger building in order that all makers of vehicles of that class might be in the same part of the show. They will occupy three-quarters of the center of the main floor and make such an exhibit of electric cars as has never been gathered under one roof. The remainder of the floor will be occupied by gasoline vehicles, as heretofore.

Those who have been familiar with the lofty roof of the armory will hardly recognize the building in its new dress. To all intents and purposes the roof will have been lowered 30 feet, making a far more homey building. It will apparently be completely roofed by a stained glass window, of beautiful design, nearly 100 feet wide and 150 feet long.

Below this all the balconies, except the first, will be hidden by a painted drapery. The upper part of the first balcony, on which exhibits are located, will be richly ornamented, the crowning piece in each section being a cluster of 12 inch globes. The walls and ceiling will be dressed in paneled scenery and real flowers to such an extent that nothing else will be visible. Hanging baskets of flowers, each basket 10 feet in diameter, will hang over the center of the floor and below them, mounted on pillars similar to those in the Coliseum, will be ornamental globes and transparent signs, which will also form a feature of the decoration of the balcony front.

The lighting of a motor show is a serious question. The show requires about twice as much light as the ordinary exhibition because of the deep colors of the cars and the enormous attendance of spectators. This year the center of the Coliseum will be illuminated by 144 arc lamps, each hung individually.

The show now has 103 exhibits of passenger cars, sixty-three of commercial cars and about 250 of accessories. There are twelve applications from makers of passenger cars, an equal number from makers of commercial cars and nearly 100 from makers of accessories on the waiting list.

ROCHESTER USING THREE BUILDINGS

Rochester, N. Y., Dec. 21—Rochester's show is to be on a more elaborate scale than any previous attempt by the energetic dealers of this place. Three of the largest buildings at Exposition park have been engaged and the show will be staged from Monday night, January 27th, to Saturday night, February 1. Building 3 is to be devoted to accessories, while 4 and 5 will be given over to motor cars. The entrance will be at one end of building 3 and exhibitors and the public will have to walk the length of accessory hall in order to get into the car exhibit. The three-building show will have an aggregate floor space of over 78,000 square feet. F. W. Peck has been re-elected president of the dealers' association, and C. E. Hartson re elected vice-president.

SHOW FOR NORTH DAKOTA

Grand Forks, N. D., Dec. 21—February 18, 19, 20 and 21 have been announced as the dates for the third annual show given under the auspices of the Grand Forks Automobile always has proved successful, both from the standpoint of attendance and results for the Dealers' Association. This is the only motor show of the year held in North Dakota and it dealers. All of the local dealers will exhibit as well as a number of firms from outside the city and state. The officers who have charge of the arrangements for the show are: Leslie Stinson, president; F. H. Haverland, secretary; H. W. Sims, treasurer; James Lyons, advertising manager.

ALBANY SELECTS DATES

Albany, N. Y., Dec. 23—Albany dealers are preparing for an unusually attractive show to be held in the state armory, opening on Saturday night, February 15, and continuing until Saturday night, February 22.

The annual election of officers of the association resulted as follows: President, Chauncey D. Hakes; vice-president, E. McK. Hunt; secretary and treasurer, J. B. Wood. These officers immediately began active preparations for the holding of a representative show.

The Readers

Keeping the Car Warm

Four Principal Types of Motor Car Heater Described for Hoosier Reader

EVANSVILLE, Ind.—Editor Motor Age—State the best method to keep a touring car warm.

2—Is there any chance of taking up an annular bearing in a front wheel?—Ohio River Contract Co.

1—As the word best has such a flexible meaning, and as preference is such an important factor, it is not possible to point out any particular type of warmer as better than any other. Those that have been found serviceable in use are of four types. The first of these is the old-fashioned carriage warmer which consists of a flat heater, in which special briquets of prepared coal are burned. This coal does not give off offensive gases nor smoke, and will burn or rather glow for several hours without attention. In later years, exhaust heaters have come into use. These consist of three-way valves which permit the exhaust gases to be deflected from the muffler to a gas radiator in the floor of the car, from whence it is ejected at the rear, the heater acting as a cooler and muffler of the gases. Another means of likewise using the heat ordinarily wasted by motor cars is to pipe the water from the engine back to a hot-water radiator in the tonneau, before admitting it to the radiator. This is a severe tax upon the pump, however, and on some cars it will not work satisfactorily. Another type which has not as yet come into general use, but which promises to become popular is the electric type.

2—Bearings of this type when worn must be replaced with new ones. As a rule they will have served a legitimate term of service before this becomes necessary.

USERS OF SPECIAL MOTORS

Waterloo, Ia.—Editor Motor Age—Give me a list of cars using the Continental motor; also cars using the Rutenber motor.—L. L. Collins.

The Continental motor is used by the Pathfinder, Ames, Speedwell, Abbott-Detroit, Bessemer truck, Lexington, McIntyre, Halladay, and Hudson. The Rutenber motor is used by the Lambert, Firestone-Columbus, Alpena, Halladay, Triumph, Lexington, and Nyberg.

SUBMITS PRIMER PLAN

Burlington, Ia.—Editor Motor Age—I have on my car a priming cup the pipe of which is connected to the intake pipe; but I find that this is not as efficient as priming through the regular priming cocks above the valves. Now, I have in mind a primer that will with one turn on the dash prime all four cylinders at once, but as there must be a pipe from primer to each cylinder connecting the regular priming cocks and above the valves, what would happen when the explosion takes place? Would there be any harm done in these small pipes? Of course there would be only enough gasoline let in at one time to prime the motor; the flow would be cut off before the engine was cranked.—A Subscriber.

Your device is all right as far as it goes, but to contemplate running an open lead to each pet-cock, through which to inject gasoline, is to court danger. The first explosion would either burst the tube, blow out the dash valve, or in case the valve was open or leaky, run back to the tank. To complete your device you will need to add a little device known as a check-valve to each lead where it enters the cylinder. A check-valve is a passage in which a valve element is so arranged that passage of fluid in one direction is unobstructed, but which makes a return now impossible. Two types of such valves are shown in Fig. 2. The one on the left is a spring-retained poppet valve. The other is a ball check, the ball floating in the body of the valve. At the outlet of the valve is a spider, which stops the ball from passing out of the valve, allowing the passage of fluid around it. At the inlet is a seat for the ball that just fits it, so that pressure in a reverse direction will force the ball back and block up the opening. You would not get very good results from your primer unless you made provision for equal distribution of the fluid to each of the cylinders, and unless you provided a positive method of measuring the exact amount of gasoline fed to each. Two simple methods of effecting these results are shown in Fig. 1. These are each made of standard fittings. The one on the right consists of four three way cocks, for a four-cylinder engine, the common leads of which connect with vertical standpipes, and the opposite leads to the gasoline tank and to the engine check-valves, respectively. The operating levers are linked to a single handle, which if moved in one direction permits the gasoline to flow from the tank to the stand pipes, and in the other direction, allows these measured charges to flow to the engine. The other differs in that the standpipes communicate with the tank through a single supply valve, at their tops, while they discharge it through a series of cocks at the bottom. This requires two controls, but is the cheaper and simpler construction. In each figure is shown a section of the vents that are necessary to allow the filling and draining of the standpipes. They are made by drilling the pipe-end caps with a very small hole, countersunk on the inside, and inserting a cork ball loosely between the hole and a screen beneath it.

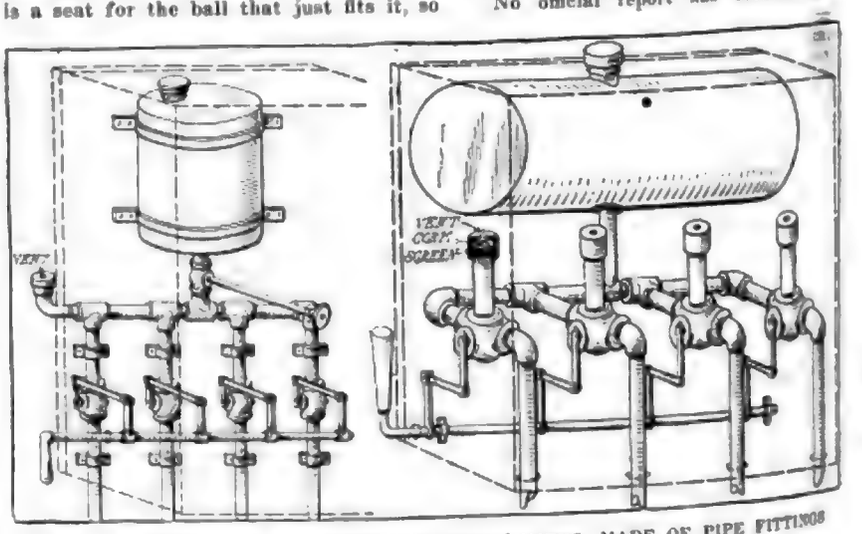


FIG. 1—MEASURING AND DISTRIBUTING PRIMERS. MADE OF PIPE FITTINGS

RACE MEET ATTENDANCE

Milwaukee, Wis.—Editor Motor Age—What was the official attendance at the free-for-all race at Elgin, August 31, 1912. Also the official attendance at the Vanderbilt and grand prix races held in Milwaukee this fall?—A Subscriber.

No official report has been made on either meet. It is estimated that Elgin had about 40,000, while the attendance at the Grand Prix was placed at 100,000.

DESIGN FOR PUBLIC GARAGE

Lincoln, Kan.—Editor Motor Age—Please publish plans of a garage. I have a lot 50 by 120 feet between two other buildings and desire a garage which will give car owners the best service possible. The building will face the south and I want show room and office in the front on side of the door. Would it be better to have a garage with a door in the middle? What kind of a roof is best suited for such a building? I want a repair shop

Clearing House

the rear. What about the location of oils and gas, also supplies and repair parts, and which makes a better floor, brick or cement? I do not want an expensive building but want a good, practical one.—R. E. Curtis.

Fig. 3 shows a type of small service garage, 50 by 110, with a 10-foot area in the rear. There are two 10-foot doors in front, separated by an office 25 feet wide. At the front is a full-width show-window, with a glass back. Behind this is desk-room, separated from the office by a railing or show-case. The office is fitted with cases for the storage of tires and accessories, and communicates with the side passages by doors on each side. The rear of the office is provided with large windows, so that the south light may go through the show-window and office into the garage. This also permits the proprietor to watch the garage while attending to the office end of his duties. The garage itself is a full-width area, preferably without pillars, over which is a large trunk light. Dividing this from the repair shop is the washrack, convenient to both portions of the establishment on the east side, while on the west side are the toilets, janitor's closet, and a set of lockers. A wide sliding door at the rear opens into the area, which will be found convenient as a place to leave cars temporarily, without being left in the alley. Against this back wall, to the west is a bench of generous proportions, while between this and the lockers are the motor and machines. On the opposite side of the repair shop is an open space for the cars being repaired to stand. At the rear of the east side is a supply locker, a tool cabinet, an oil cabinet, and the main gasoline pump. A branch gasoline and oil station is located behind the office for the benefit of transient trade. The gasoline is stored in an underground tank in the area, filled from above. The best roof for such a garage is an arched trussed affair that provides ample strength without necessitating any pillars. Cement is to be preferred as a flooring material to brick as it is more even and easier to keep clean. With the doors of glass in vertical panels, a surprisingly decorative effect is produced, and an abundance of light admitted, with only a slight additional cost over that of the usual type of garage door.

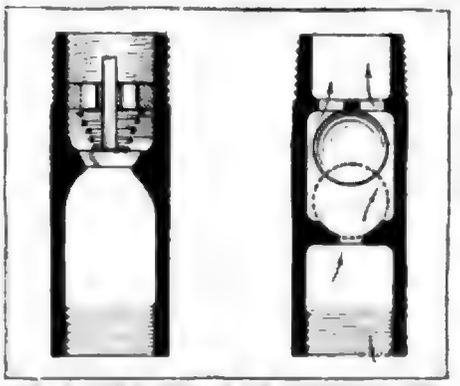


FIG. 2 TWO FORMS OF CHECK-VALVES

STOPPING FORD REAR AXLE LEAK

Jasper, Mich.—In Motor Age, issue November 28, was a complaint from Mr. Garner about the trouble he is having with his Ford car leaking oil around the brake bands through the rear axle. I had the same trouble with my car until I put on a new felt washer which had previously been varnished on one side and which absorbed the varnish about half the width of the washer. Since then it has not leaked a drop of hard oil.

Air-Cooled Two-Cycle

Features of Design of Light Cars and Rare Type of Engine Discussed

LOCK HAVEN, Pa.—Editor Motor Age—What is the street address of the Metal Preservative Co., Chicago?

2—In Motor Age, issue November 14, it is stated that the magneto in the new Studebaker is placed near the front. How is the magneto protected frm water, sand, etc.?

3—Is there any make of pleasure car using a direct air-cooled, two-cycle engine such as is used on the delivery truck put out by the Brockway Motor Truck Co., Cortland, N. Y.?

4—How does the two-cycle, direct air-cooled engine compare in efficiency with the water-cooled, poppet-valve engine?

5—Is there to be any radical change made in the Ford line for 1913?—J Milton Lord.

1—The Metal Preservative Co., is located at 1137 Randall place, Chicago.

2—The position of the magneto on the Studebaker is sufficiently high as to make it more proof against water and sand than when placed in the conventional position at the side of the crankcase.

3—The Duryea Buggyaut uses such a motor. The Jonz and Page-Adrian, no longer manufactured, used motors of this type.

4—Theoretically a two cycle motor or an air-cooled motor, either one will produce higher efficiency than the standard type, so that the combination of the two features in one engine may be considered a theoretical ideal. In practice, the results attained have never measured up to the promises of such engines from an abstract standpoint. This is to be attributed to the lack of development that this type has undergone. However, motors of this type are reputed as highly satisfactory in the hands of users.

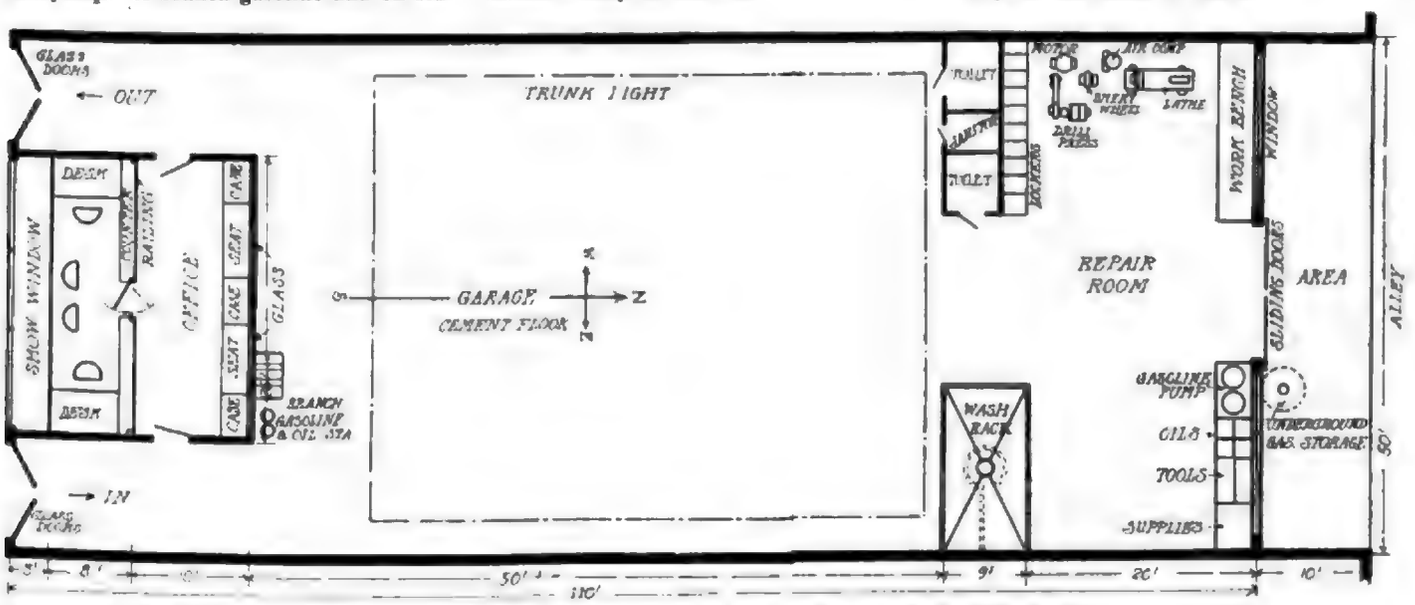


FIG. 3—PLAN OF ONE-STORY GARAGE AND REPAIR SHOP, 120x150

The Motor Car Repair Shop

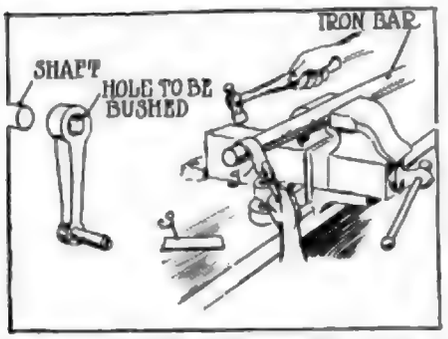


FIG. 1—METHOD OF REBUSHING STARTING CRANK

Effective Differential Reinforcement

IN Fig 2 is shown a means whereby a certain taxicab company has succeeded in greatly reducing the noisiness of the different mechanisms of its cars, and at the same time gained an increase in the life of the differential mechanisms that cuts down the expense of upkeep to no slight extent. The differential gear as indicated in the illustration is of the spur-gear type with the squared ends of the driving shafts resting in square holes in the large central gears. It was found that after the gears of the differential mechanism became worn to a certain extent they would become noisy, and that when dis-assembled the central gears of the differential could be moved in an eccentric fashion because of the lost motion. Therefore, to steady the operation of the large differential gears a spider was fitted between the two halves of the casing as indicated. This contained in its center a bearing for the support of both the inner hub ends of the large differential gears.

The spider is made of iron forged into shape and its central bearing portion is lined with a bronze bushing. The legs of the spider leaving the center at angles of 120 degrees, pass between the three pairs of small differential pinions very nicely, and by cutting a little metal away from the inner sides of the large differential gears a generous bearing surface on the extensions of the inner hubs is obtained without weakening the large gears to any appreciable extent.

Rebrushing a Starting Crank

Though it is rather an unusual thing to find the starting crank of a motor car loose on the shaft, the repair of this nature seen in a London repair shop is applicable to so many other parts of the motor car that a description of it may be of value to other repairmen, especially to those who still have something to learn. The starting crank in this case was secured to the shaft with a tapered pin, and having worn loose the pin was removed; the starting-crank end bored out

Reinforcing Differential

to true it up and allow for the insertion of a bushing, and then a brass bushing sweated into it so that a tight fit on the shaft could be obtained. Unless the big end of a crankarm is a snug fit on a shaft the tapered pin used to secure it thereto will soon wear and become loose in service; it is quite necessary, therefore, that the crankarm be a fairly tight driving or press fit on the shaft before the pin is fitted.

In refitting the starting crankarm in this case, the hole in the arm was bored out nearly ⅛-inch larger in diameter. A strip of brass S Fig. 1 about 1-16-inch thick was then cut to fit as a lining into the hole in the crankarm. In approximating the size of this strip, the width was obtained from the width of the crankarm; the length was obtained by multiplying the diameter of the hole by 3 1-6; the latter figure being the nearest simple fraction for 3.1416, which if multiplied by the diameter of any circle will give the circumference of that circle. Thus the approximate length of the brass lining was obtained. The lining then was cut from a sheet of brass, and tinned on both sides. The tinning process consisted in heating the brass strip then swabbing it with soldering acid and applying a coat of tin or solder with a soldering iron. In doing this, as soon as the tin has flowed over the entire surfaces, the superfluous solder should be wiped off with a bundle of thin paper on a dry cloth.

The next operation is to bend the strip of brass into the form of a cylinder and fit it into the hole in the crankarm. To bend it into cylindrical form, a piece of iron rod or piping or the end of the starting-crankshaft if convenient, is used as a mandrel and secured in the vice; the strip of brass is then bent as nearly as possible into shape with the fingers and finished up with a hammer as indicated in the illustration. Having obtained the cylindrical form, it may be found a trifle too large for the hole in the crank arm, but this is easily remedied by cutting a little off the end of the strip.

The next step is to apply a coat of tin to the inside of the crankarm, which is done by heating it a trifle, swabbing the inner surface with acid, and then applying the solder with an iron as described above. As soon as the crankarm has been tinned the brass bushing is started into the hole in the crankarm while still warm; the end of the crankarm is then held over the flame of the iron oven or torch until the solder begins to flow, when it will be found that the bushing can be easily pushed or tapped into place. To finish up the job neatly, the protruding edges of the brass bushing are filed flush, swabbed with acid and soldered smooth.

Care of Tool Handles

Careful workmen will take quite as much care of the handles of their tools as they do of the working portions. Air and water quickly ruin a hammer or chisel handle, if not provided against. Dry, hot air will dry them out and water will warp and rot them. The handles as well as the heads or blades of tools should be rubbed with oily waste.

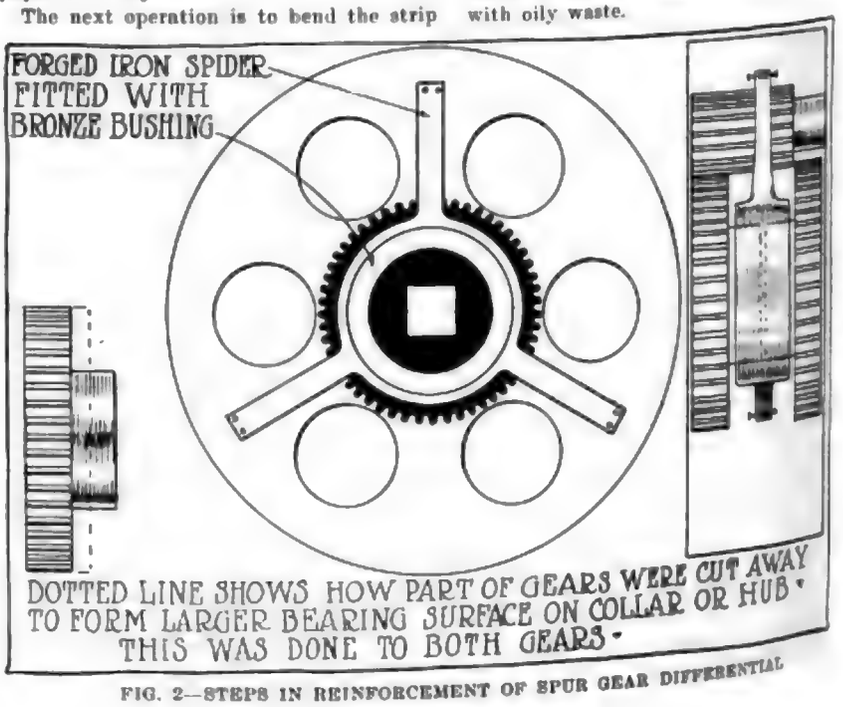
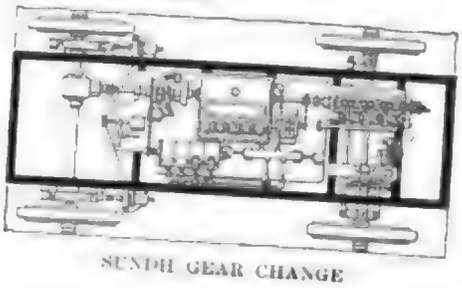


FIG. 2—STEPS IN REINFORCEMENT OF SPUR GEAR DIFFERENTIAL

Current Motor Car Patents

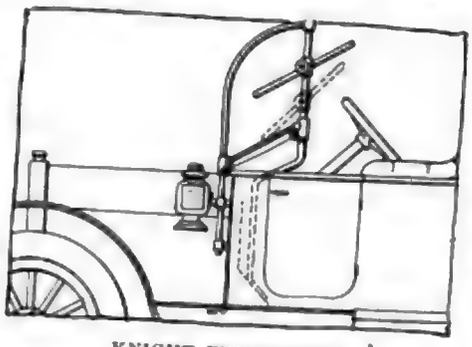


SUNDH GEAR CHANGE

COMBINED Motor Car and Motor Boat—No. 1,047,271—To Hartley A. Mitchell, Newport News, Va. Filed November 13, 1911, dated December 17, 1912. A vehicle capable of travel on either land or water, this invention consists of a motor boat, fitted with an engine and propeller wheel, to which is secured a pair of axles and detachable wheels, which are connected to the boat by springs. A hoisting device within the boat is used to raise the wheels and axle sections into the boat. This device is arranged to turn the axles end for end in the act of raising them, and to reverse them back to their normal disposition, in lowering them again. The patent does not refer to any detail, nor does it specify the reasons for the reversal of the axles in raising them. In use, the vehicle would be run upon its wheels on land, driving and steering in the usual manner. Upon reaching water, it would be run upon its wheels, into the water, until it floated, clear of its wheels, when the latter would be lifted and deposited within the boat, by the manipulation of the hoisting device.

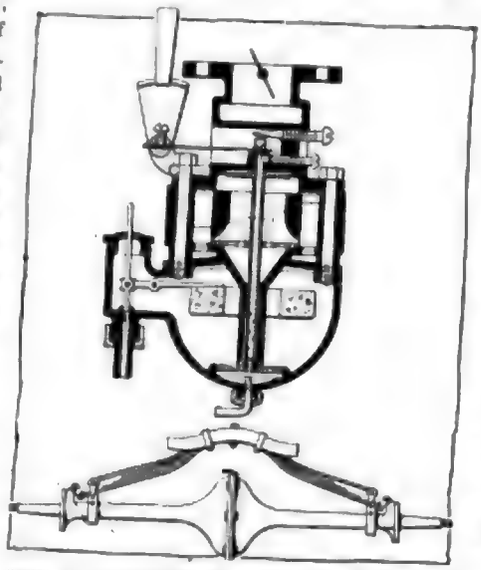
Windshield—No. 4,047,317—To Frank Knight, New Haven, Conn. Filed December 12, 1911, dated December 17, 1912. This windshield is of the single pane type, comprising a veritical standard with a curved stay-rod secured to its upper end, and to the body of the car, in front of the fastening of the vertical standard. Between the two members is an inclined apron, entirely below the line of vision of the driver. This apron is supported by cross members. The pane is secured to the vertical standard at about its center, the means whereby it is secured being a sliding block and friction pivot, which permits the pane to be revolved upon the pivot and locked at any angle, and to be elevated or lowered by means of the sliding block and locked in any position vertically.

Speed-Regulating Carbureter—No. 1,047,595—To John F. Twigg, San Francisco, Cal. Filed November 8, 1909, dated December 17, 1912. A new principle of vaporization is involved in the carbureter referred to in this patent. The carbureter is of the float-feed type, having a mixing chamber above it. The bottom of the mixing chamber, which constitutes the cover of the float chamber, in the form of a funnel, terminates in a tube and extends down into the fluid in the float chamber. Within this tube is a small spaced one, which extends upward to an adjustable opening to the atmosphere, and downward to a closed end at the bottom of the float chamber. At this lower end the tube is perforated to allow air to pass from it to the gasoline in the outer tube, which surrounds it. The inner air tube is secured integrally to a dash-pot piston in a short cylinder at the bottom of the float chamber, which acts as a valve between the outer tube and the float chamber, regulating the amount of fluid to be admitted to the space between the tubes. The suction in the mixing chamber draws the air in the central tube down through

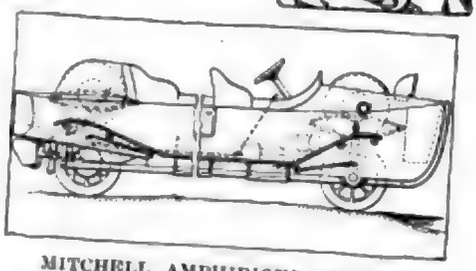


KNIGHT WINDSHIELD

the gasoline and up through the tube, entering the mixing chamber as a gasoline vapor. The mixing chamber is a gasoline vapor. The mixing chamber is provided with a series of surrounding auxiliary air valves whose passages are of different lengths. Adjustments are provided for the stroke of the central air



TWIGG CARBURETER AND YATES SHOCK-ABSORBER



MITCHELL AMPHIBIOUS VEHICLE

tube, to regulate the proportion of gasoline and air delivered by the outer tube to the mixing chamber.

Ford Shock Absorber—No. 1,047,477—To Gideon D. Yates, Lisle, N. Y. Filed July 13, 1912, dated December 17, 1912. As a shock absorber for cars having transverse half-elliptic springs, in which the center is secured to the frame, and the ends to the axle, this patent refers to a flat spring, secured to the center of the vehicle spring, and fastened at its ends to adjustable shackles secured to the axle housing. The action of this spring is in the reverse direction to that of the vehicle spring, so that it exerts no resistance to the flexure of the spring, but resists its rebound. The adjustment permits of regulation of the degree of resistance offered.

Electrically Controlled Change-Gear—No. 1,047,329—To August Sundh, Yonkers, N. Y., assignor to Otis Elevator Co., Jersey City, N. J. Filed March 6, 1909, dated December 17, 1912. In reference to a hydraulic change-gear, this patent relates to an electric control mechanism, to govern the effect of the effort on the part of the driving element upon the driven element. The particular type of change-gear employed consists of a fluid pump, driven by the engine, which induces a flow of fluid from itself to a hydraulic motor, which in turn exhausts the fluid through a passage leading to the non-pressure side of the pump. On the motor is a slide-valve designed to vary the extent of surface exposed to the stream of fluid from the pump. The object of this function is to vary the proportionate speed of the motor to the pump, by forcing the flow of fluid from the pump, which may be assumed as constant, to pass through a small volume of the motor, thus driving it at high speed, or to spread out over a large volume, thus driving slowly. This slide-valve is electro-magnetically controlled, the control also governing a bi-pass which allows the fluid to pass from the pressure side to the non-pressure side of the pump, without going through the motor, thus providing a neutral position.

The electromagnetic control would be operated by a suitable control at the driver's seat, or by an automatic governor.

a chemical action begins between the liquid, which is called the electrolyte and the zinc plate. The electrolyte eats into the zinc very much more rapidly than it does into the copper and the chemical action of the electrolyte on the zinc liberates bubbles of gas, each bubble of which is charged with electricity. Where the bubble gets this charge we will not go into at this time. Suffice it to say that these bubbles of gas carrying the electric charge make their way through the electrolyte to the copper plate, where they collect and give up their electric charge to the copper plate.

So as long as the chemical action continues, these gas bubbles are carrying electric charges away from the zinc plate one after the other and depositing them on the copper plate so that the copper plate is charged much more than the zinc plate is. Whenever one end of a conductor, or one part of the electric circuit is charged more highly than the other electricity will flow from the more highly charged portion to the less charged portion. The copper is said to have a higher potential than the zinc and wherever there is a difference in potential there is a flow of electricity, provided there is a conductor for the electricity to flow through. Consequently, in the simple cell, illustrated in Fig. 19, there will be a flow of electricity in the cell itself from the zinc to the copper with the gas bubbles. Also on the outside of the cell there will be a flow of electricity through the wire in the direction of the arrows from the copper terminal to the zinc terminal. The copper is called the positive terminal and the zinc the negative terminal. Instead of copper, carbon is quite often used as the positive terminal, with an alkali electrolyte.

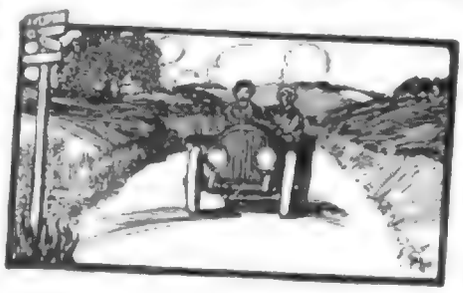
In the case of cells of this kind where carbon or copper is used, the more rapidly the electricity flows in the outside circuit the more rapidly it flows through the electrolyte and the more rapidly the gas bubbles pass from the negative to the positive plate. When this action takes place rapidly, that is when there is heavy flow in the outside circuit, the gas bubbles are deposited on the positive plate faster than they can pass off into the air and the bubbles will begin to pile up on the side of the plate so that those that come later cannot give up their charge to the copper plate. The electric action slows down and finally stops and the cell will generate no more electricity until those bubbles which have covered the plate have had an opportunity to pass off. This is what is known as polarizing and it is overcome by putting around the copper plate, or carbon plate, a depolarizing solution usually called a depolarizer. This is contained in a case which will hold the depolarizing liquid, but which allows the gas to pass through from the negative plate. The depolarizer is simply a liquid which absorbs the bubbles so they do not pile up on the positive plate. See Fig. 20.

Manufacturers' Communications

NEW YORK.—Editor Motor Age—Among the many grotesquely absurd and illogical measures presented by inexperienced and misguided legislators, the new highway regulations now pending before the national highway commission of New York restricting the weights which can be placed on motor trucks on New York highways represents highway legislation raised to the nth power of asininity. It is a measure that if enacted will impede progress in motorized highway transportation such as no other measure or set of measures ever could effect. Briefly speaking, this measure seeks to block the wheels of commerce by taking the illogical premise that roads should be built only for horsed vehicles and not for motor trucks. In other words, these regulations take the attitude that our roads are already good enough for horse vehicles and that the policy of "let well enough alone" must be adhered to and that the motor truck has no right on the public highways. This measure is the most direct thrust at industrial progress that ever has been presented for the serious consideration of intelligent people.

No sane, well-informed individual who knows road conditions in the United States and in Europe will grant that American road building is anything more than in its infancy and that as large as the sums appropriated for highway improvement have been, they are not adequate for the building of the permanent highways which Europe has had the farsightedness to build and which have been the instruments for reduction of the cost of highway haulage to but a fractional part of what it costs in the United States to move a ton of freight over our crude roads.

Instead of attempting to restrict the growth of motorized highway commerce which the public demands to effect a quick and economic movement of the necessaries of life and cut down the frightfully excessive cost of living, these agitators against the use of motor trucks on the highways would have us continue to move our commodities as did the ancient Egyptians 5,000 years ago. Instead of aiming a blow at the motor truck it would seem that they would take the broad, philosophical view of seeking to encourage the building of highways to bring about that long desired era in economic distribution of the commodities of commerce which every unprejudiced, sensible, well-informed student of economics knows can never be gained by the continuance of obsolete roads and obsolete vehicles.



If the $50,000,000 that have been appropriated by the New York legislature for highways is used in an intelligent, honest manner to build the kind of highways which commercial conditions of this city demand, there could be no possible objection to the use of any wheeled vehicle whether operated by steam, gasoline or electricity on them. No motor truck, even if it were practical to build them with weights of 20 tons on each axle, could do the slightest damage to a highway built of cement, for example; and the contention that motor trucks do damage even to the comparatively crude roads now in existence is the statement which emanates from prejudiced interests against the motor truck.

In the first place everyone knows that motor trucks use wide rubber tires and that the distribution of the load per unit of tire surface is considerably less than distribution of the load on a narrow, steel-tired vehicle which cuts deeply due to the localizing of the pressure on a narrow strip of surface. Again, there is practically no destructive shock against the surface of a road by a motor truck equipped with 5 or 6-inch double rubber tires with which most trucks of even 4 or 5 tons aggregate capacity are equipped. The easy action of a rubber surface against any road material, particularly on a vehicle like a motor truck which does not average more than 10 miles per hour in medium size units on country highways, is not anything like as destructive as the use of say a four-horse team equipped with 3-inch steel tires operating on asphalt-surfaced highways in warm weather. Furthermore, the abrading section of a macadamized highway caused by the suction generated by the tires of a rapidly moving pleasure motor car is entirely absent in a motor truck, as the speeds cannot be attained with commercial motor vehicles which set up this scouring effect.

The whole problem resolves itself into the broader and farsighted view of building highways to realize the best possible advantages of the era of motorized highway transportation and not the ignorant and narrow attempt to forestall the far-reaching material, social, and humanitarian benefits which the motor truck can give to the world.—International Motor Co., R. W. Hutchinson, advertising manager.

Brief Business Announcements

KIRBY, O.—Philip Oelberg has built a 32 by 36 garage at Kirby, and will handle the Ford.

San Francisco, Cal.—The Reo-Pacific Co. is now installed in its new quarters at 555 Golden Gate avenue, San Francisco.

Ogden, Utah—The James Automobile Co. will erect a new garage. The plans call for a building 40 feet front by 140 feet deep.

Detroit, Mich.—W. A. Ryan has been appointed manager of the Ford Motor Co.'s Detroit retail store. He formerly was manager of a department at the factory.

Boston, Mass.—The R. L. & H. H. Smith Co., agent in Boston for the Mais truck, has moved from 1002 Commonwealth avenue in the Back Bay to 17 India street.

Detroit, Mich.—Walter I. Jordan, formerly western traveling representative for the Flanders Motor Co., has become manager of the local branch for the Hoffecker Speedometer Co.

Richmond, Va.—The Chesterfield Motor Car Co. is in new quarters on West Broad street, while the home of the Foster Motor Car Co. has been remodeled. The latter company is specializing with the Klinekar.

Springfield, Mass.—The Westfield Motor Truck Co., organized at Westfield, Mass., and with branches in Springfield and Boston, has filed a petition in bankruptcy with liabilities at $20,616.67 and assets about $4,000.

Neenah, Wis.—The J. F. Strobel Co. of Neenah has broken ground for a fireproof building to be used as a garage, repair shop, agency and farm implement warehouse. The building will be three stories high, with a high basement and cost about $50,000.

Boston, Mass.—The C. B. Johnston Co., just formed in Boston, has taken on the Pullman and the Ames cars in addition to the Stewart truck. Salesrooms have been opened in the Motor Mart, Columbus avenue.

Minneapolis, Minn.—Charles S. Marshall, manager of the Minneapolis branch of the United States Tire Co., has resigned to become northwestern agent for the Racine Rubber Co., 911 First avenue S. This is to be a new branch. E. B. Tozier of the Diamond Rubber Co., succeeds Mr. Marshall.

Milwaukee, Wis. The Milwaukee branches of the Goodrich and Diamond tire concerns have been merged, and the local business will be continued at the old Diamond branch house at 132-136 Oneida street. The Goodrich branch at 450 Jackson street is discontinued. J. T. McDonald, manager for the Goodrich company at Milwaukee for several years, has been placed at the head of the consolidated branches.

Cleveland, O.—R. M. Hawkins has resigned as assistant purchasing agent of the Standard Welding Co.

Pittsburgh, Pa.—The Craig-Center Auto Co. has taken a long lease on the property at the corner of Grais street and Center avenue. The company is a dealer in second-hand cars.

Toledo, O. The Willys-Overland Co. of Toledo, formerly the Toledo Motor Co., has filed papers with the secretary of state changing its name to the Central Grove Automobile Co.

San Diego, Cal.—The Columbus Buggy Co. has opened its new branch factory in San Diego. O. K. White has been appointed manager. Recently a branch was opened in Pasadena.

Indianapolis, Ind.—Cecil Taylor, formerly engineer for the Chalmers, Hudson and Studebaker, is now consulting engineer for the Rutenber Motor Co., with factories at Logansport and Marion, Ind., and in Canada.

Bowling Green, O.—George E. Mercer, of Bowling Green, has been thrown into involuntary bankruptcy by Eugene Jones, the Bowling Green Garage Co., and B. F. Heriff, whose claims amount to nearly $1,000. E. D. Bloom has been appointed receiver.

Boston, Mass.—Arrangements are being made to place an agency for the Nyberg car at Boston, the first steps being the leasing of quarters for a service station at 233-239 Massachusetts avenue, Cambridge, just across from the Boston motor district.

South Bend, Ind.—The Milton G. Smith Garage and Automobile Co. has increased its capital stock to $25,000. With the increased capitalization, two new stockholders, L. W. Spring, of Chicago, and Harvey Garber, of South Bend, were added to the list.

Philadelphia, Pa.—Stephen W. Bourne, formerly western sales manager of the F. B. Stearns Co., has been appointed manager of the Philadelphia branch, relieving G. Hilton Gautert, who, however, will still remain with the company in the capacity of special representative. Mr. Gautert has been in poor health lately.

Chilton, Wis.—The city of Chilton, Wis., now has its first complete garage, salesroom and repair shop, the Hippe Motor Car Co. having completed a two-story building, 50 by 80 feet in size, in which general motor car work will be carried on. The Hippe Motor Car Co. is headed by Herman Gierow and Robert Hippe is secretary and treasurer. The company has the agencies for the Overland, Rambler and Buick cars.

Delta, Utah—The Millard County Transportation Co. will erect a new garage in the spring.

Racine, Wis.—The Racine Brass and Iron Co. has broken ground for a new office building and is making improvements in its works.

Kiel, Wis.—The Kiel garage has been purchased by Walter M. Loos from his father, J. G. W. Loos, who retires because of ill health.

Detroit, Mich. W. J. Ready, superintendent of the Lozier Motor Co., has resigned to become manager of the Star Motor Co. of Ann Arbor.

Salt Lake, Utah—The Elliot Motor Car Co. is the newest concern to open up in this city. The company will handle the Oakland. Harry Elliot is the manager.

San Francisco, Cal.—The San Francisco branch of the Franklin Automobile Co. has moved from Golden Gate avenue to 1635-45 California street, just east of Van Ness avenue.

San Francisco, Cal.—L. V. Lynch, formerly president and manager of the Speedwell Motor Car Co., of California, has been appointed western district manager for the Speedwell.

Milwaukee, Wis.—By taking on the Chalmers line, the Smith-Hoppe Auto Co., 215 Wisconsin street, now carries the two original lines of the Kopmeier Motor Car Co. of Milwaukee—the Detroit electric and Chalmers.

Washington, D. C.—The White Automobile Co. has been formed to handle the White line of pleasure and commercial cars. The company has secured the sales room at 1312 Fourteenth street N. W. formerly used by the Chapman-Love Co., agent for the King.

Racine, Wis.—The Perfex Radiator Co. of Chicago, which recently moved its plant to Racine, has filed articles of incorporation in Wisconsin. The authorized capital is $15,000 and the incorporators are John F. Wolf, A. B. Modine and F. M. Opitz. The company has already started the manufacture of radiators, pumps and other cooling devices for motor cars and trucks.

Indianapolis, Ind.—H. G. Deupree, for the past 2 years assistant sales and advertising manager of the Remy Electric Co., Anderson, Ind., has resigned to become vice-president and active executive of a large real estate company in Indianapolis—the Sourbier-Emrick Realty Co. H. G. Sourbier was the founder of the Marion Motor Car Co., of Indianapolis; was associated with J. N. Willys in the develop

ment of the Overland company and recently sold out large holdings in the Ideal Motor Car Co.

Detroit, Mich.—Sydney J. Grant has been appointed Detroit branch manager for the Grinnell Electric Car Co.

Ripon, Wis.—Schaefer Brothers have leased the former washing machine plant at Ripon and opened a garage, repair shop and agency.

Richmond, Va.—An amendment has been issued to the charter of the Taylor Motor Co., changing its name to the Lynchburg Motor Car Co., Lynchburg, Va.

Washington, D. C.—George T. Howard has been appointed manager of the local branch of the Goodyear Tire and Rubber Co., succeeding F. W. Powers, who has been promoted to the managership of the Goodyear branch in Philadelphia.

Boston, Mass.—Harry A. Clapp has formed a motor corporation capitalized at $30,000, of which he is president; Harry McCaffrey, treasurer, and F. O. White, secretary. It is called the Simplex Automobile Agency.

Detroit, Mich.—Akron will be headquarters of John V. Mowe, formerly manager of the Detroit branch of the Firestone Tire and Rubber Co., after January 1, at which time his resignation from that office becomes effective. Mr. Mowe goes with the Goodyear Tire and Rubber Co.

Chippewa Falls, Wis.—The Chippewa Falls Auto Co., of Chippewa Falls, Wis., has opened its new garage. The building is three stories high. The company also has a large garage at Eau Claire, Wis. F. A. Bigler is general manager of the concern and A. L. Redmond will manage the new Chippewa Falls end of the business. The lines handled by the concern are the Rambler and Studebaker.

Indianapolis, Ind.—Harry J. Enders has been made general superintendent of the Oakes Co., making radiator fans.

Fresno, Cal.—The Oakland Motor Co. has opened a branch in Fresno under control of the San Francisco branch. Charles B. Bargent has been made manager.

Racine, Wis.—Charles A. Armstrong, assistant sales manager of the Mitchell-Lewis Motor Car Co., Racine, Wis., has resigned, effective January 1. A successor has not yet been chosen.

Boston, Mass.—L. B. Johns has been appointed manager of the New England branch of the General Motors Truck Co., with headquarters at the company's office on Boylston street, Boston.

Janesville, Wis.—The E. A. Kemmerer Automobile Co. has taken occupancy of its new garage building, erected at a cost of $35,000 and covering nearly a half block at 206-208-212 East Milwaukee street. The building affords 37,500 square feet of space and 300 cars may be stored in it.

Indianapolis, Ind.—John W. Wilson and Philip C. Smith have leased a building at Lawrenceburg, Ind., in which they will manufacture a motor car wheel upon which Mr. Wilson has recently been granted patents. About forty men are to be employed in the new plant at the start.

Detroit, Mich.—Walter H. VanDusen, formerly with the Chalmers Motor Co., and Joseph Warren, formerly with the Chalmers, Metzger and Abbott companies, have formed a business combination to be known as the VanDusen-Warren Sales Co. The new concern will have offices in the Ford building and will act as agent for manufacturers of accessories.

Racine, Wis.—Harrison D. Flegel of Racine is about to market a new type of gauge for measuring the depth of liquids in tanks. Mr. Flegel is establishing a workshop for its manufacture.

Ripon, Wis.—The firm of Stewart & Meier has been organized here to conduct a garage, repair shop and agency business. Charles Meier formerly managed the Third Street Garage Co. and Standard Exchange Co., of Milwaukee, Wis.

Detroit, Mich.—Orin S. Wilson, formerly manager of Studebaker branches at Denver, Colo., and Des Moines, Iowa, has been assigned to the east and south as district representative of the Studebaker sales department. His headquarters will be in New York city, Broadway and Fifty-ninth street.

Sheboygan, Wis.—J. L. Evans and M. P. Hanson of Racine, Wis., have established the E. & H. Motor Co. of Sheboygan, to distribute the Mitchell and Regal, and the Chase commercial car. Temporary quarters have been established in the Erie garage, but in the spring a large building will be erected for the new company.

New York—The Motometer Co., Inc., was recently organized with headquarters at 1784 Broadway, New York city, George Townsend II is president and treasurer, and Harrison Boyce, secretary. The company will market a new device invented and patented by Mr. Boyce, and known as the motometer. It is an instrument, which by an ingeniously arranged dial, tells the driver at all times the exact heat of his

Recent Agencies Appointed by Motor Car Manufacturers

PLEASURE CARS

Town	Agent	Car
Auburn, N. Y.	Stillwell Auto Co.	Lozier
Bartlesville, Okla.	Cherokee Motor Car Co.	Moon
Baltimore, Md.	D. C. Walker Auto Co.	Mitchell
Beaver Falls, Pa.	Seanor & Williams Co.	Cole
Berlin, Ont., Can.	Aaron Bricker	Cole
Boston, Mass.	J. W. Bowman	S. G. V.
Brockton, Mass.	L. E. Reynolds	Cole
Charlevoix, Mich.	J. A. Vought	Cole
Clark, Mo.	Clark Auto Co.	Moon
Columbia, Tenn.	Columbia Motor & Implement Co.	Cole
Connellsville, Pa.	Connellsville Garage	Cole
David City, Neb.	Doty Motor Co.	Cole
Dwight, Ill.	Short's Garage	Kisselcar
Fargo, N. D.	Ball Auto Co.	Kisselcar
Fort Wayne, Ind.	H. G. Raymond	Kisselcar
Harrisburg, Ill.	Charles V. Parker	Moon
Hazelton, Pa.	Adam Eidam	Cole
Horicon, Wis.	Hornlein Brothers	Velie
Iron River, Mich.	Bishop & Chero	Kisselcar
Manhattan, Kans.	Charles H. Lantz	Kisselcar
Medicine Hat, Can.	Dominion Motor Machine Co.	Kisselcar
Milwaukee, Wis.	Smith-Hoppe Auto Co.	Chalmers
Muskegon, Mich.	W. P. Marshall	Cole
Oakland, Cal.	C. C. Eichelberger	Kisselcar
Pittsburgh, Pa.	Alpine Motor Co.	Kisselcar
Reading, Pa.	D. B. Hoffer & Sons	Lozier
Rochester, Vt.	F. J. Robinson	Cole
Richmond, Va.	Lozier Motor Sales Corp.	Lozier
Salem, Ore.	Chamberlin Brothers	Cole
Sandusky, O.	J. F. Singler	Moon
San Francisco, Cal.	Dillon-Goodwin Co.	Moon
Saskatoon, Sask., Can.	Robert McIntosh	Cole
Sheboygan, Wis.	E. & H. Motor Co.	Mitchell
Sheboygan, Wis.	E. & H. Motor Co.	Regal
Sherbrooke, Can.	J. W. McKee	Kisselcar
Southport, Conn.	Burkley's Auto Station	Lozier
Strong City, Kans.	Jacob Hinden	Cole
St. Johnsbury, Vt.	Percival & Silsby	Kisselcar
St. Louis, Mo.	New York Motor Car Co.	Pathfinder
St. Louis, Mo.	Von Arx Brothers Automobile Co.	Winton
St. Louis, Mo.	T. J. Moss Motor Car Co.	Borland
Taft, Cal.	Jack L. Maddox	Kisselcar
Tampa, Fla.	Prewitt Auto Co.	Moon
Taylor, Tex.	West Coast Auto Co.	Cole
Toledo, O.	Cornelius-Hohly Automobile Co.	Imperial
Traverse City, Mich.	William Goode	Cole
Topeka, Kans.	Vesper & Evans	Cole
Victoria, Can.	Moore & Pauline	Cole
Waterloo, Ia.	Miller Motor Car Co.	Lozier
White Rock, S. D.	Rydell & Hokenson	Kisselcar
Williamsport, Pa.	E. L. Sheffer	Cole
Winfield, Ia.	Nesbitt Auto & Supply Co.	Moon
Winnipeg, Can.	Canadian Motors Co.	Little
Quebec, Can.	Frank Campbell	Cole

TRUCKS

Town	Agent	Car
Austin, Tex.	Thomson-Haiff Co.	Federal
Birmingham, Ala.	Birmingham Motor Co.	Federal
Columbus, O.	Coates Motor Co.	Federal
Connellsville, Pa.	Connellsville Garage	Federal
Dallas, Ore.	Walther-Williams Hardware Co.	Federal
Greenville, S. C.	W. Conway Thompson	Federal
Houston, Tex.	Hawkins-Haiff Co.	Federal
Kansas City, Mo.	Dailey & Warriner	Federal
Lexington, Ky.	Blue Grass Auto Co.	Federal
Louisville, Ky.	Cumberland Motor Co.	Federal
Newcastle, Pa.	Edward E. Hileman	Gramm-Bernstein
Pueblo, Colo.	Ideal Motor Car Co.	Federal
Rochester, N. Y.	J. Cunningham	Federal
Sheboygan, Wis.	E. & H. Motor Co.	Chase
Syracuse, N. Y.	A. J. Jackson	Federal
Toledo, O.	Atwood Automobile Co.	Toledo
Toledo, O.	H. B. & W. H. Wilkinson	Federal
Youngstown, O.	Youngstown Carriage Co.	Federal

motor and warns when overheating and accompanying damage is about to take place.

Bartow, Fla.—F. M. Say has bought out the garage and service department of the Joe B. Johnson branch here, while he retains the Buick sales agency.

San Francisco, Cal.—The Dillon-Goodwin Co. is the new sales agency for Moon cars in San Francisco. The salesroom is located at 345 Van Ness avenue.

Milwaukee, Wis.—The American Tire and Rubber Co., Akron, O., has established a branch at Milwaukee under the management of Albert Weisskopf. The headquarters are at 252-254 Fifth street.

Los Angeles, Cal.—Buxton & Childs, the Moon agents in Los Angeles, will move into their new building, situated at Pico and Olive streets. Mr. Childs just recently became Mr. Buxton's partner.

Philadelphia, Pa.—The premises at 332-334 North Broad street, lately the home of the American car, have been completely renovated and are now occupied by the Wallace Automobile Co., which recently secured the agency for the Studebaker line. A garage is attached to the rear of the building.

Boston, Mass.—The American and Marion agencies in Boston have been consolidated, following a visit to the Hub by President J. I. Handley, of the American Motors Co. and the Marion Motor Car Co., of Indianapolis. The American-Marion Motor Car Co. has been formed with F. F. Wentworth as president, and Frank L. Roberts, of the Roberts & Sherburne Co., and President J. I. Handley, of Indianapolis, as directors. The Copley square salesrooms of the American has been given up and the two lines will be marketed from the Marion headquarters at 1002 Commonwealth avenue.

Ellsworth, Wis.—The Ellsworth Auto and Repair Co. has completed the construction of its new garage building, but will continue its old garage until next spring, using the new building for dead storage.

Boston, Mass.—The Myer Abrams Co. of Boston, agent for the Lauth-Juergens trucks, is considering the advisability of invading the New York territory also, this having been offered to the company. If the plans go through sub-agencies will be opened in cities in Massachusetts, Rhode Island and Connecticut between the two larger places.

New York—The Bosch Magneto Co. announces the appointment of the following additional distributing agencies: Johnson-Gewinner Co., 124 Peachtree street, Atlanta, Ga.; Pence Automobile Co., 800 Hennepin avenue, Minneapolis, Minn.; Fry & McGill Motor Supply Co., Denver, Colo.; Dallas A. Shafer & Co., 106 North Eighth street, Richmond, Va.

Los Angeles, Cal.—S. H. Van Nuys has leased for 10 years to J. W. Leavitt & Co., California distributors of the Overland car, the property located on the west side of Olive street, near Pico, with a frontage of 55 feet and a depth of 155 feet. A two-story brick building is being erected. The lease carries a total rental of approximately $63,000. Another transaction of importance is the lease effected by William C. Keim to I. C. Buxton, agent for the Moon car. A one-story brick will be erected 76 by 145. Another lease recently completed includes the White Car Co., Inc., to Boynton & Goldman, agents for the Hereshoff car, the salesroom and garage at 810-12 South Olive street.

Minneapolis, Minn.—George H. Richards, secretary-treasurer of the Veerac Motor Co., has resigned to become secretary of the Minnesota Bankers' Association, with headquarters in Minneapolis. He will continue stockholder and director.

Beloit, Wis.—The Beloit Auto and Machinery Co., recently organized at Beloit, has taken over the business of the Fourth Street Garage Co., and will for the present occupy the old quarters at 842-846 Fourth street. Next spring a large new garage and warehouse will be erected.

Buffalo, N. Y.—The Buffalo Electric Vehicle Co. has made an addition to its facilities in Buffalo, having acquired the Buffalo Motor Vehicle Service Co. The latter company has a complete garage and service station at 178 West Utica street, and is closely affiliated with the Buffalo General Electric Co. and the Rochester Railway and Light Co. The property acquired includes the garage and service station located on lands immediately adjoining the factory and service station of the Buffalo Electric Vehicle Co.

Milwaukee, Wis.—The report that the United States Tire Co. would on January 1 establish a direct factory branch at Milwaukee to supersede the state agency held by the Goodyear Rubber Co., 382-386 East Water street, Milwaukee, has been confirmed. On January 1 the company will establish a branch at 454-456 Milwaukee street, and Edward C. Dusold will be in charge as general branch manager. It is stated that the Goodyear Rubber Co. will continue to act as distributor for the G & J division of the United States Tire Co. in the Wisconsin territory.

Recent Incorporations

Birmingham, Ala.—Blacklock Tire and Rubber Co., capital stock, $3,000; incorporators, K. Blacklock, H. H. Bostick, H. Blacklock.

Boston, Mass.—Blake Spark Plug Co., capital stock, $100,000; incorporators, F. R. Blake, A. C. Gould, I. Vanderbrock.

Bridgeport, Conn.—Jones Pneumatic Tire Spring Co., capital stock, $100,000; incorporators, L. D. Jones, E. E. Brandeau, C. R. Hall.

Brooklyn—Bedford Auto Renting & Repair Co., capital stock, $10,000; incorporators, G. J. Murphy, J. H. Bernstein, A. E. Fuchs.

Brooklyn—Brooklyn Auto Livery Co., capital stock, $20,000; incorporators, L. W. Boynton, D. B. Hicks, C. M. Fuller.

Buffalo, N. Y.—Buffalo Automobile Sales Corporation, capital stock, $15,000; incorporators, W. J. Harris, W. N. Heverly, M. MacDonald.

Cambridge, Mass.—E. C. Andrews & Eagles Co., capital stock, $1,000; to paint cars; incorporators, E. C. Andrews, N. Russell Lyn, C. A. Eagles.

Cincinnati, O.—Ideal Lamp Co., capital stock, $5,000; to deal in motor car lamps; incorporators, V. E. Shields, H. Faultless, W. C. Klein, R. S. Oppenheimer, E. F. Peters.

Cincinnati, O.—Northway Motor Co., capital stock, $600,000; incorporator, R. E. Northway.

Clarksdale, Miss.—Montroy Ignition Starter Co., capital stock, $10,000; incorporators, J. M. Montroy, C. L. Montroy, E. M. Fant, E. Fant.

Cleveland, O.—Rutzen Power Co., capital stock, $100,000; to manufacture motors; incorporators, D. W. Corbin, F. J. Peck, D. H. Tilden, A. M. Snyder, N. I. Young.

Cleveland, O.—R. M. Allen Motor Sales Co., capital stock, $10,000, to deal in motor cars; incorporators, R. M. Allen, R. M. Allen, H. W. Wiebush, T. B. Logan, H. C. Kugy.

Columbus, O.—Youngstown Automobile Show Co., capital stock, $1,000, incorporators, W. P. Williamson, J. Van Vaalen, J. A. Henderson, J. W. Kuhns, C. T. Gaither.

Detroit, Mich.—Detroit Autoheater Co., capital stock, $3,000; to manufacture heaters; incorporators, Oswald Zahn and others.

Detroit, Mich.—Cragg Motor Mfg. Co., capital stock, $4,000; to manufacture motors and accessories; incorporators, E. F. Alleman.

Indianapolis, Ind.—New Miller Carbureter Co., capital stock, $200,000; to manufacture carbureters.

Jersey City, N. J.—Maccarr Co., capital stock, $125,000; to deal in motor cars; incorporators, R. Carr, K. Kramlich, C. E. Fisk.

Jersey City, N. J.—Wheel of Fortune Corporation, capital stock, $600,000; incorporators, L. H. Gunther, H. A. Black, J. R. Turner.

Lawrence, Mass.—Edison Electrical Vehicle Co., capital stock, $50,000; directors, J. F. Morin, F. A. Lambert, W. F. Leighton.

Morgantown, W. Va.—Chaplin-Dille Motor Car Co., capital stock, $25,000; to manufacture and deal in motor cars; incorporators, B. M. Chaplin, J. E. Dille, M. Chaplin, M. C. Wildman, O. H. Dille.

Nahant, Mass.—Bay Side Motor and Yacht Club, capital stock, $25,000; incorporators, A. L. Rowell, W. H. Southwick, W. N. Wright.

Newark, N. J.—Touraine Motors Co., capital stock, $37,500; motor car business; incorporators, C. H. Van Vleck, Jr., E. M. Dalley, F. N. Kolb.

Newark, N. J.—Best Tire Co., capital stock, $125,000; to manufacture motor car tires, incorporators, S. L. Henry, M. Walker, E. Spillane.

New York—Vaughan Car Co., capital stock, $1,000,000; incorporators, R. C. Thompson, J. Kahn, P. T. Kammerer.

New York—Collier Rotary Valve Co., capital stock, $100,000; incorporators, J. N. Blair, H. D. Johnson, A. B. King.

New York—Favary Tire Co., capital stock, $300,000; incorporators, E. Favary, W. P. Richardson, M. W. Brashears.

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New York—Columbus Circle Auto Co., capital stock, $500; incorporators, M. Beckert, I. Rosenberger, W. J. Leimer.

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Oroville, Cal.—Chico Garage Co., capital stock, $10,000; incorporators, F. S. Stabler, T. H. Morgan, S. P. McLerran.

Patchogue, N. Y.—Patchogue Garage Co., capital stock, $1,500, incorporators, J. A. Udall, Jr., H. J. Lawrence, J. A. Udall.

Port Chester, N. Y.—Nelson's Garage, capital stock, $1,000; incorporators, F. Nelson, M. Nelson, J. Colantonio.

Richmond, Va.—Warner Speedometer Corporation, capital stock, $11,400,000; incorporators, J. E. Hauronic, H. S. Perrigo, F. Flippen.

San Antonio, Tex.—Motor Car Supply Co., capital stock, $5,000; incorporators, F. P. Guthrie, H. B. Lyne, J. Harrison, W. Harrison.

Somerville, Mass.—Caverly Automobile Co., capital stock, $5,000, incorporators, T. Caverly, W. A. Thibodeau, E. C. Caverly.

St. Louis, Mo.—Waverly Sales Co., capital stock, $5,000, incorporator, F. E. Stevens.

St. Johnsville, N. Y.—H. & C. Auto Co., capital stock, $3,000, incorporators, C. A. Herrick, Birman, S. V. Christman.

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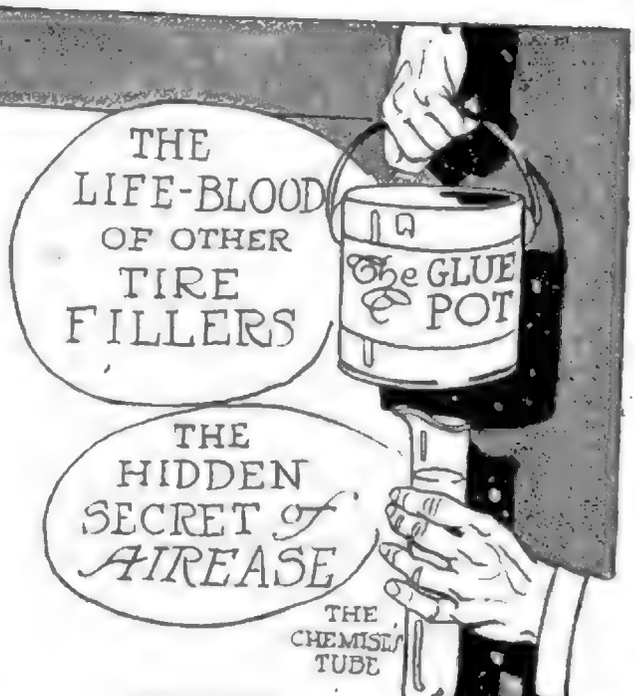

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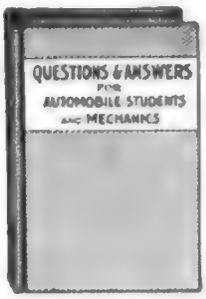

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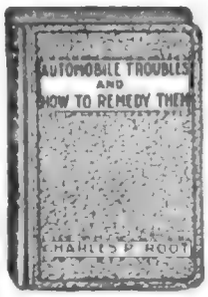

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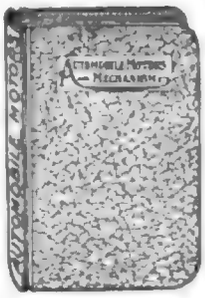

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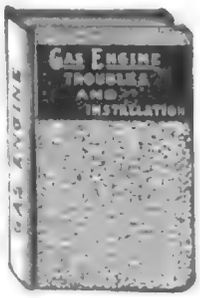

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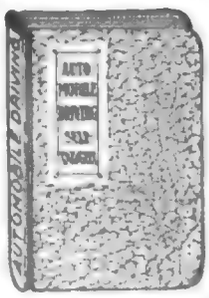

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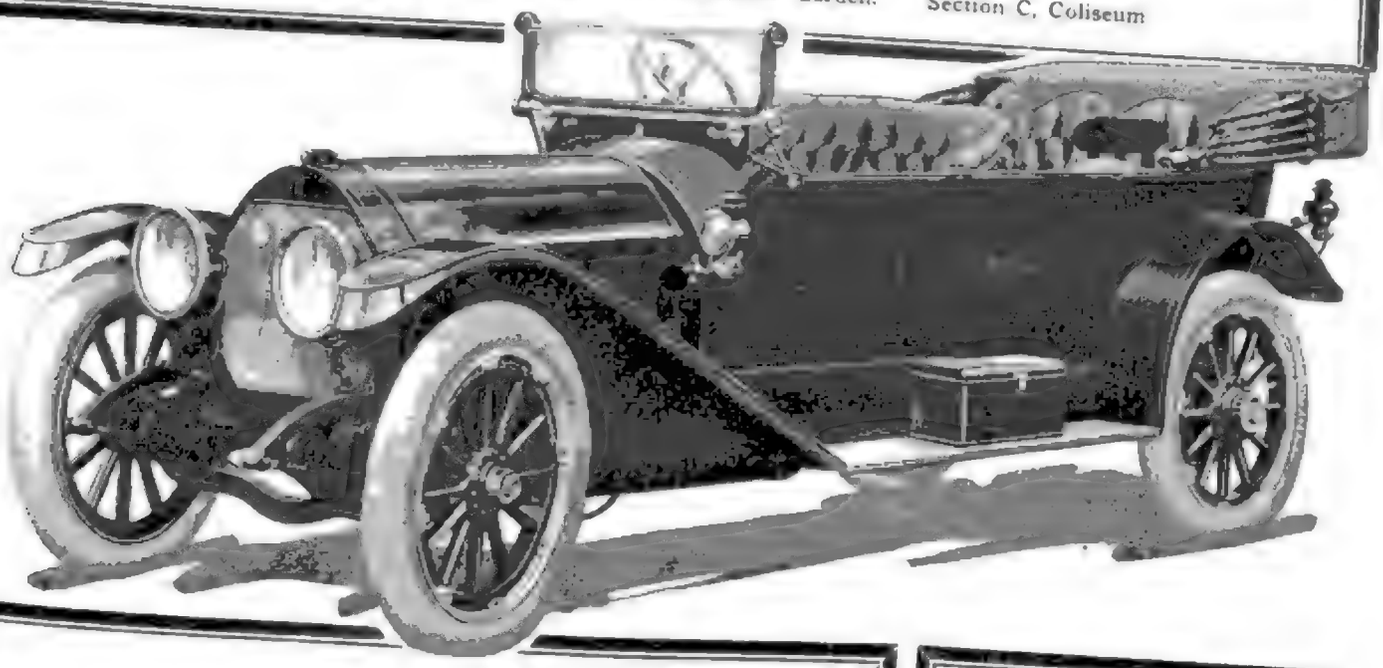

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Ignition—Splitdorf dual system.

Equipment—Electric lights, 100 ampere battery, mohair top with side curtains and boot, zig-zag shield, speedometer, horn, complete tool kit, and nickel finished throughout.

There are many other features that we would like to specify, but space does not permit. Come and see these cars at once. By getting your order in now you will secure one. A day or two late may deprive you of the greatest roadster bargain that we have ever offered.

REMEMBER THIS IS
A $1,500 new roadster, guaranteed for life, that we are offering for $875.

TIMES SQUARE AUTOMOBILE COMPANY
1210-1212 Michigan Ave.
Chicago, Ill.

PACKARD DEMI-LIMOUSINE; BEST OF condition. Krit coupe, just overhauled and painted, for sale cheap. Ajax Auto Co., 316 E. 43d St., Chicago.

PREMIER
Rebuilt cars like new.
Must sell quickly to make room for new Models.
1912 Welch 1910 Winton.
1911 Chalmers. 1909 Pearless.
Will make special price to move these cars.
The Quality Car Co.,
2329 Michigan Ave., Chicago.
Cal. 4601.

SEE THESE BEFORE YOU BUY; NO Junk—Must be seen to be appreciated:
Baker Electric Coupe, looks like new.... $500
Columbia Electric Coupe, rebuilt 500
Maxwell Touring Car, rebuilt 550
Maxwell Runabout, in fine condition 350
Warren-Detroit, 30 h. p., 5 passenger 475
Overland, 36 h. p. roadster, good order 375
6131 Cottage Grove Ave., Chicago

SPEED-RATE OF 100 MILES AN HOUR guaranteed—Stanley Racer—low price. Excellent condition. O. P. Tyler, 31 Central St., Worcester, Mass. m

THREE-TON GRAMM AND FOUR-TON Knox Trucks, $2,250 and $2,750; will trade for Coast real estate. Clarke, 529 Hamilton Bldg., Portland, Oregon.

1909 FOUR-CYL., 40 H. P. WINTON; NEW tires; completely equipped. $400. Address Box D 224, c/o Motor Age mc

1910 AMERICAN — SEVEN PASSENGER, 50 h. p.; overhauled, new top, $800. Address Box D 227, c/o Motor Age mc

1910 CHALMERS 30—REPAINTED, NEW top, new tires; $700. Address Box D 226, c/o Motor Age. mc

1911 CHALMERS 30—4-PASSENGER; NEW tires; complete equipment, $700. Address Box D 228, c/o Motor Age mc

1912 CHALMERS 30 — RUN ONLY 4,500 miles, fine shape; $1,000. Address Box D 228, c/o Motor Age mc

1912 COLE 40—5-7 PASSENGER, COM-pletely equipped, including electric lights and extra seats. Repainted. Tires nearly new. $1,140.00. O. C. Peterman, Jamestown, N. Y.

4—20-PASSENGER AUTOMOBILES IN A-1 condition, have been operated between city and summer resort, conditions have changed is reason for selling them. Address 47 Highland Terrace, Brockton, Mass. m

7-PASSENGER FRANKLIN, 6 CYLINDERS. Cost $4,250. Splendid condition, $1,000. Bond Motor Co., 1615 Grand, Kansas City, Mo.

Cars Wanted

AUTOMOBILE WANTED—WILL TRADE A tract of A1, well located, high, pine citrus fruit land for 5-passenger car in good condition. Address J. Walker Pope, Winter Haven, Fla.

CARS WANTED.
Want Ford, Buick or other light car. Will trade small screw machine, typewriter, pulleys, belting, hangers, small motor, watchman's clock, power blower. Best car gets outfit. Address P. O. Box 112, Anderson, Indiana. f

EXCHANGE 5c AND 10c HABANA CIGARS at wholesale price for auto in good condition. H. Raverty, New Albany, Ind.

TO EXCHANGE — MOTORCYCLES FOR runabout. Wolke Cycle Co., Louisville, Ky.

TOURING CAR WANTED—HAVE TO EX-change a good single cylinder Reo Runabout, in good condition and 75-foot frontage in live Iowa town of 2,500. Real estate has water on it and cement walks (no buildings), value $850, cash. Want even trade, full description first letter. Address Box 4, Center Junction, Iowa. a

WANTED—FOUR-CYLINDER RUNABOUT. Wolke Cycle Co., Louisville, Ky.

WANTED—SMALL RUNABOUT IN EX-change for choice corner lot in city of Moffat, Colorado. Beede, Vermillion, S. D.

WANTED—1912 AUTO IN EXCHANGE for 160 acres good Minnesota land. Address Box 414, Marshalltown, Ia k

WE BUY AND SELL YOUR AUTOS FOR cash. If you have a Touring Roadster, Limousine, Taxicab, Commercial Car, Truck or Sightseeing Car and desire to dispose of it quickly, communicate with us. Give us full description. Late models and in good condition. Strictly business. Enclose stamp for reply. Universal Auto Sales Co., 1826 Wood Ave., Harrisburg, Pa

Parts and Accessories
FOR SALE

A BARGAIN—TWENTY SETS OF MARSH Rims, Q. D., size 36x4. Twelve Bodies—four and five passenger—high grade. The Sebring Motor Car Co., Sebring, Ohio.

A BATTERY BARGAIN—6-80 STORAGE batteries, Exide, Vesta, National, Universal, for auto igniting and lighting, $1.50 to $7.50. 4105 Cottage Grove Ave., Chicago. a

A LIMITED NUMBER OF NEW HIGH grade 25-30 and 30-35 h. p., four-cyl. motors with Remy magneto and coil. Only a few left. Prices very low. F. E. Alford, Goshen, Ind.

ALL NIGHT MACHINE AND GARAGE CO. Shop operated every hour of every day. No extra charge for night work. Make any part for any car. We hurry up. 7031 So. Chicago Ave., near Cottage Grove Ave., Chicago. Dan Morgan Smith (owner); Ph. Normal 3266

ALUMINUM VULCANIZERS FOR BOTH casings and tubes. $2.00 prepaid to any address. Money back if not satisfactory. Truscott Supply Co., St. Joseph, Mich.

ATTENTION—HENRY OWNERS

Having purchased the repair business of the Henry Motor Co., we are prepared to fill orders promptly for repairs for Henry cars.
Muskegon Automobile Co.
Muskegon, Mich.

AUTOMATIC ENGINE STARTERS (Spring), guaranteed; $100 to $125. J. W. Tudor, 35 Congress St., Boston, Mass.

AUTOMOBILE BODIES, PLEASURE AND commercial.
Foredoors for open-front cars.
Write for prices.
Auto Specialty Mfg. Co., 326 E. Market St., Indianapolis, Ind.

AUTOMOBILE SELF-STARTER
For $1. Will send you details of a reliable self-starter that can be put on a 4-cylinder car at a very small cost. Simple and effective. H & B Auto Co., 928 Waverly, Houston, Texas.

A WET CLOTH AND A PACKAGE OF Ar-Gen-Tor is all that you need to plate all the brass trimmings on your car with a heavy, permanent plate of pure silver. Your car will always look new, and you will not have to polish brass any more. Does not contain mercury or poisonous cyanide. Send $1 today for large size box.
Forest City Sales Co.,
Fremont, Neb

PEERLESS AUTO TOP DRESSING.

A waterproof dressing for leaking mohair and duck tops and curtains. Makes old and faded tops look like new. Ask your garage and supply dealer for it.

The Columbus Varnish Co., Columbus, O.

BALL & ROLLER BEARINGS, ALL TYPES.
Distributors of
"F & S" Ball Bearings.
"New Departure" Ball Bearings.
"Pressed Steel" Ball Bearings.
"Standard" Ball and Roller Bearings.
BALL BEARINGS REPAIRED
THE GWILLIAM COMPANY,
New York—Broadway, at 58th St.
Philadelphia—1314 Arch St.

BODIES, FOREDOOR, TOURING RUN-about, $15.00 to $50.00. Fenders painted dark blue, $10.00 set of 4; Selective type 4 speed shifting levers, complete with emergency brake lever, $8.00. Other bargains. Automobile Appliance Co., 1712 Michigan Ave., Chicago, Ill.

CELLULOSIA—BEST SUBSTITUTE FOR glass used in automobile and buggy storm fronts, side curtains, etc. Sheet 20x36 in., 85 cents; 12x20 in., 35 cents, postpaid. Hawes Storm Front Co., Coldwater, Mich.

CHEAP—TO QUICK PURCHASER—4-, 5- and 7-passenger aluminum touring bodies. Also a few panel delivery bodies for cars of about 100" wheelbase.

SWEETEN AUTOMOBILE COMPANY,
3430 Chestnut St., Philadelphia.

CUT-OUTS
E.M.F., Flanders, Buick, Regal, etc. Complete outfit with brass lock, open pedal, $1.50. Lincoln Machine Shop, Lincoln, Ill. c

PEERLESS BACK & CUSHION DRESSING

Softens the leather and will not crack, wash or rub off. Makes old leather look like new. Dries in twenty minutes. Ask your garage or supply dealer.

The Columbus Varnish Co., Columbus, O.

DETROIT FORE-DOORS
for
E-M-F, Ford and Hudson.
One piece aluminum; immediate shipment subject to inspection.
Detroit Fore-Door Co.,
564 Porter St., Detroit, Mich.

DISCO SELF-STARTERS
For Sale. Only a few. Equip your car with a self-starter for this winter. Guaranteed new stock. List price, $50; our price, $12.50. Parsons Sales Co., 1817 Grand, Kansas City.

"DON'T ENVY A SMOOTH RUNNING MO-tor, use Hagstrom Spark Plugs and have one." Write for gas tank key and price list to The Hagstrom Bros. Mfg. Co., Inc., Lindsborg, Kan.

DON'T GET COLD FEET!
Use Our Heater.
For full particulars write to
Garrison Gasoline Engine Specialties Co.,
251 Richmond Street,
Desk 1, Philadelphia, Pa.

DRAGON REPAIR PARTS.
We manufacture and keep on hand all repair parts for the Dragon cars. We make a specialty of repairing this machine. Philadelphia Machine Works, 67 Laurel St., Philadelphia, Pa.

ELECTRIC LIGHTING EQUIPMENT.
We can furnish a complete system for $36. This outfit consists of one 6-volt, 140-ampere battery, two head lights, two side lights, one tail light, wire for car switch and bulbs. Head lights are 10-inch solid brass with silver plated parabola reflectors, and side lights are 5-inch same material. The Ampvo Battery Co., 1607 Michigan Ave., Chicago, Ill.

E. M. F. PUSH ROD ADJUSTERS
$1.50 for complete set delivered. Money back guarantee. Auto Parts Co., Providence, R. I.

PEERLESS EXTRA FINE BLACK BAKING Japan.
Bakes either to a high gloss finish, eggshell gloss or dull finish on lamps, radiators and fenders. Will not crack, chip or peel. Ask your garage and supply dealer.

The Columbus Varnish Co., Columbus, O.

FORD, BUICK, OVERLAND, E-M-F, MAX-well, Reo, Chalmers, Mitchell, Air-Friction Carbureters, drive your cars three miles per hour on high. Much more speed; much less gas. Our new Model B starts easy in zero weather. Satisfaction or refund money. Air-Friction Carbureter Co., Dayton, Ohio.

FORD, HUPP AND MAXWELL
Muffler cut-out machined ready to attach, including lock, open pedal string and cables, $1.35. Lincoln Machine Shop, Lincoln, Ill. c

FORD FAN BELTS—WOVEN COTTON and silk; outlasts six regular belts. Postpaid, 75c. Dealers write. Angler's, Streator, Ill.

FORD OWNERS

A postal brings you our 1912 catalog of 22 necessities for your car. Auto Parts Co., Providence, R. I.

FORD OWNERS AND DEALERS!

You will save trouble and money by installing our timer elevating device.
Ford Parts Specialty Co.,
1211 Main St., Richmond, Ind.

FORD OWNERS—SPARE WHEEL FOR Fords, save tire trouble. It's new; write Angler's, Streator, Ill.

FORD OWNERS—TOWNSAN VALVE AD-justers will quiet your motor. $1.50 by mail. Townsan Auto Specialty Co., Mitchell, S. D.

FORD T OWNERS
Foot throttle or accelerators, $1.50. Lincoln Machine Shop, Lincoln, Ill. c

FORE DOORS
Made for all makes of cars. Prompt shipment guaranteed. F. E. Dortz Co., 2503 E. 55th St., Cleveland, O.

FOR QUICK SALE

We are offering the following articles, of which we have a limited quantity left, subject to prior sale.

Bosch DU-4 type 5, high tension magnetos	$25.00
Splitdorf Model "X" magnetos with coil	20.00
Herreschoff runabout bodies with cowl dash	30.00
Herreschoff touring car bodies	40.00
Flanders suburban tops	13.50
Windshields, Sterling ($25.00 kind)	6.00
24x4 wheels, with demountable rims, complete (Per set)	12.00
Barnes steering gears, 17" wheel	10.00
Mayer 1⅛" carburetors (new)	3.50

Write us about your requirements.

AUTO PARTS MFG. CO.,

Detroit, Mich.

FOR SALE—AUTO BODIES, FORE DOOR, new, $60.00 to $95.00. Motors, Axles, Auto parts and accessories. Closing out factory stock.

Independence Motors Co.,
Detroit, Mich.

FOR SALE—COUPES FOR IMMEDIATE delivery. Stylish, up-to-date and well constructed. Fit almost any car. Write us. Robbins & Co., Indianapolis, Ind.

FOR SALE

Fore Doors for all cars.
Overland Detachable Tonneaus
Ford Detachable Tonneaus
Ford Coupe Bodies
Top Delivery Bodies
Four-Passenger Bodies
Frames and Dashboards
14-gallon Gasoline Tanks
Rumble and Surrey Seats

Special Seats, Tonneaus and Bodies for all cars.

The Metal Body, Tank & Fender Co.,
Cleveland, Ohio.

FOR SALE—NEW UNIVERSAL DE-mountable rims, 5 to a set complete, $10; 32x3½; 34x3½; 34x4; 34x4½. Triple Action Spring Co., 215 E. 21st St., Chicago.

FOR SALE—ONE LIMOUSINE BODY FOR Stearns 30-60 chassis. Body cost $1,750 when new; used one season and in perfect condition. Price, $800 f. o. b. Louisville.

Louisville Lozier Company
Louisville, Ky.

FOR SALE—TWO WORM DRIVE REAR Axles, designed to carry 5,000-lb. load—made by Morse-Williams Division of Otis Elevator Co., Philadelphia, Pa. Have never been in service. Make us an offer for them. Sheldon Axle Company, Wilkes-Barre, Pa.

FOR SALE—30 MODEL "38" OVERLAND bodies with detachable tonneau, never been used before, $15 each. F. E. Lortz Co., 2503 E. 55th St., Cleveland, Ohio.

FRAMES, 34-INCH WIDE—112 W. B. straight, each	$10.00
Frames, 36-inch wide — 112 W. B. straight, each	12.00
Frames 36-inch wide — 124 W. B. straight, each	14.00
Unassembled frames—Kickup 112-inch W. B., 34-inch wide, each	8.00
For assembling each	4.00
Wheels 34x3½, 32x3½, 36x4½, per set	12.00
Axles—40-50 H. P., rear, each	$45.00
30-40-50 H. P., front, each	12.00
Radiators, 30 H. P., honeycomb, each	14.00

Address Box D 169, c/o Motor Age.

LIMOUSINE AND LANDAULET BODIES
At Reduced Prices.

High grade make and latest styles, will fit any standard chassis. We do mounting, painting, and turn out complete jobs, at a saving of 50 per cent.

Pacific Motor Car Exchange Co.,
224 W. 54th St., New York.

PEERLESS EXTRA FINE BLACK JAPAN.

Covers solid, one coat for enameling lamps, radiators and fenders. No undercoat required. Heat does not affect it. Ask your garage and supply dealer.

The Columbus Varnish Co., Columbus, O.

JANUARY BARGAINS

3—Rambler 2 cyl. radiators	$ 10.00
2 Cyl. Ramber motor and trans	50.00
2 Cyl. Ford motor and transmission	40.00
4 Cyl. Beaver motor, 4½" bore	75.00
4 Cyl. Unit power plant, disk clutch, electric transmission, 30 h. p.	150.00
New mohair tops, for Buick 10, Flanders 20, Ford, N. S. & R.	13.00
Pressed steel frames—10 sizes	3.00 up
34x3½ & 36x3½ wheels, O. D. clincher rims, 10 and 12 1½" spokes...(set 4)	10.00

Before buying, see our list.

AUTO PARTS CO.

513 to 531 Jackson Blvd., Chicago.

MAXWELL PUSH ROD ADJUSTERS

$1.50 for complete set delivered. Money back guarantee. Auto Parts Co., Providence, R. I.

MORA REPAIR PARTS

We purchased the repair business of the Mora Company, and have in stock repair parts for all models of Mora cars. Philadelphia Machine Works, 67 Laurel St., Philadelphia, Pa.

NEW COUPE BODIES FITTED TO CAR, $250. Send for photo.

Fred Allen Auto Supply Co.,
1610 Michigan Ave., Chicago, Ill.

NICKEL PLATE YOUR AUTO TRIMMINGS with Electro-Knickel. Prevents brass from tarnishing, iron from rusting. This is not a silver or mercury wash. We guarantee it plates (without a battery). Price $1.00, express prepaid. Write for information. Gun Metal Finish Co., 313 Powers Blk., Decatur, Ill.

NEW UNIVERSAL DEMOUNTABLE RIMS, 5 to a set complete, at $6.00, in sizes of 34x4, 36x4, and 36x4½. Write for our rim part circular. Kastner Tire & Rim Co., 2112 Michigan Ave., Chicago, Ill.

PEERLESS LEATHER TOP DRESSING.

An oil preparation that softens the leather and pantasote. Makes old tops look like new. Ask your garage and supply dealer for it.

The Columbus Varnish Co., Columbus, O.

QUICK SALE

Liquidation & Realization Corporation.
One lot new Victor Presto Self-Starters.
One lot Leader Vulcanizers.

Leader Vulcanizer—We have been fortunate enough to secure for quick realization a large lot of Leader Steam Vulcanizers. Double your tire mileage. Leader Steam Vulcanizer will do it. It is the factory process put into a portable size. You do not have to remove the tire from the rim—can be operated on the road if necessary. Can be carried in your tool box.

This device will reduce your tire expense two-thirds, and you escape the delay of sending tires to the repair shop. Anybody can operate. Original selling price $15.00 net. Our price for quick sale $7.50, as long as they last.

Victor Presto Self-Starter—This starter attaches to your Prest-O-Lite tank, and it can be attached by any garage man at an expense of not over three hours at the outside. These starters adopted by 1913 Maxwell and other cars. Were made up for U. S. Motor's car and not delivered owing to receivership. Former list $35.00—Sale Price $5.00.

Must be sold—shipments by express, C.O.D. or send draft with order. Above prices good only while the lots last. Money refunded if not satisfactory.

GEO. H. BOWLER, Agent.
511 Hippodrome Bldg., Cleveland, Ohio.

50 H. P. POPE-HARTFORD ENGINE, USED one season, $175; new U. & H. T. Magnetos, $25.00; slightly used R. D. Remy Magneto, with coil, $20.00; one A No. 3 Stromberg carbureter, like new, $15.00. Pope-Toledo parts for sale. Auto Salvage and Parts House, 1436 Wabash Ave., Chicago.

OXY-ACETYLENE WELDING PLANTS The Admiral Welding Machine is the ideal welding device; large capacity; self-generating throughout; portable; complete in every detail; a perfect machine for all work, large or small. Send for our booklet, "Welding," and full description. Price, $200, f. o. b. Kansas City. Admiral Mfg. Co., 715 Lydia Ave., Kansas City, Mo.

PARKINS CARBURETOR, ELECTRIC Horn, Complete Lighting System for Car, Dynamo, Battery, Lamps, Switches, Sockets. Low Prices for Quick Sale. Young, Nyack Ave., Lansdowne, Pa.

PISTON RINGS, ALL SIZES, THIRTY cents each. Merritt Company, 311 W. 59th St., New York City, N. Y.

PLATE THE BRASS ON YOUR CAR WITH silver. Our preparation deposits pure silver over the surface of brass. With little expense you can keep the brass on your car a bright silver color. Simple to use, applied with a cloth. We also have the best nickel polish on the market. Does not wear the nickel off but adds to its luster and durability. $1.00 per bottle. Enough to plate the brass on your car for one year. Agents wanted. Write today.

Re-Plating Co.,
Box 474, Rochester, N. Y

RADIATORS—NEW GUARANTEED GOODS

Ford, Model T	$16
Buick Model 10	22
Buick Model F	25
Chalmers-Detroit	30
Everett	20
Stoddard-Dayton	25

And any other make required at equally low prices.

Times Square Automobile Co.,
1210-1212 Michigan Ave., Chicago.

RADIATORS

Our radiator list is complete and are offering all new radiators at prices that would save you from 25 to 50 per cent.

Ford Model "T" radiators	$16.00
Ford Model N, R & S radiators	22.00
Buick Model "10" radiators	26.00
Hupmobile radiators	17.00
Flanders "20"	25.00
Buick "16" and "17"	15.00
Everitt "30" radiators	20.00
F. A. L. radiators	18.00

Write for those not mentioned.

AUTO PARTS MFG. CO

Detroit, Mich.

REPAINT YOUR CAR YOURSELF—WITH our materials and full instructions you can repaint your car as well as a regular painter and save from $25 to $50, depending on its size. Previous experience unnecessary. Latest colors. Write today for full information and color cards. We also make Liquid Gun Metal, the National Brass Enamel, $1 a can, express prepaid. The only articles of proven merit for lamps, radiators, etc. No polishing. Arsenal Varnish Co., Automobile Dept., Rock Island, Ill.

PEERLESS LINING DYE

Dyes the cloth linings of tops and curtains a black, uniform color, covering up water stains and grease spots. Does not wash off. Ask your garage and supply dealer.

The Columbus Varnish Co., Columbus, O.

SEAT COVERS FOR ALL CARS—SPECIAL price on Fords. We clean old covers, make them look like new. Auto Cape Top Co., 2334 Michigan Ave., Chicago.

SIMPLEST WAY ON EARTH TO TIME valves and spark on automobile and gasoline engines, 25c. D. Strong, Homer, Mich.

TOPS BUILT, RECOVERED AND RE-paired.

C. G. Meyer & Son, Tiffin, Ohio

VULCANIZING PLANT, BOILER, POT, 2 sec., 1 sec., large plato, rims, springs, complete; territory over 200 cars; no competition; $600. Richards' Garage, Casper, Wyo.

WE SELL FOR LESS!!!
Original Mail Order Auto House.

Silk mohair top	$10.00
Side lamps	1.75
Head light	5.00
Tail lamp	pair 1.00
All size wheels	2.00
Windshield	7.50
Speedometer	8.00
1-inch carburetor (Puritan)	1.00
Ford Model T radiator	18.00
Ford Model N-S-R radiator	23.00
Runabout body	30.00
Touring car body, 2-door	35.00
Touring car body, 4-door	40.00
5-Passenger, 1912 body	52.50
Oval gasoline tanks	3.75
Buick Model 10 radiator	26.00
Bosch magnetos	24.00
Splitdorf type magneto and coil	22.00

Puritan Machine Co., 51 Tenth St., Detroit, Mich.

For Sale or Exchange

FOR SALE—ONE PAIR OF SLAMA TIRE Protectors, 30x3, or will trade for Stewart speedometer that is in good shape. What have you to offer? W. J. Ferrier, Potwin, Kans.

FOR SALE—250 ONE-TON AUTO EX-press bodies, or will trade for truck and runabout. A. TRAUB, Jackson, Mich.

Auto Wearing Apparel

ATTENTION—HAVE A FEW MANUFAC-turer's samples, gentlemen's black broadcloth fur lined overcoats lined throughout with Australian mink. Large genuine Persian lamb collars, sizes 36 to 48. Value, $75; will sacrifice for $35 each. Also several lady's handsome long fur coats, satin lined, worth $90, while they last, $35; and a few large size fur robes, plush lined, $15 each. All guaranteed new. Examine before buying. Send express charges. Will send on approval. Write or call, E. Roberts, Room 6, 160 West 119th St., New York.

Parts and Accessories
WANTED

I AM ALWAYS IN THE MARKET FOR pneumatic tires of all kinds, regardless of quantity. If you have a price that is interesting, write me. J. G. Whinham, Buffalo, N. Y.

WANTED—
AUTOMOBILE PARTS
and electric accessories to manufacture; large factory, modern machinery and nickel plating plant, operated by skilled mechanics; advice and estimates free. Swedish-Am. Telephone Mfg. Co., 1746 Farragut Ave., Chicago, Ill.

WANTED — SECOND-HAND IRON Planer, 20"x20"x4'. Address F. P. Hish, Tower Hill, Ill.

WE ARE IN THE MARKET FOR JOB LOTS of all kinds of car parts; complete and incomplete automobiles, new or second-hand in carload lots. Give particulars and price when writing. The Jones Auto Exchange, Wichita, Kan.

Situations Wanted

A YOUNG MARRIED MAN WITH 5 YEARS' experience in all makes of automobiles, both truck and pleasure cars, desires position as general repair man or driver. Will go anywhere. Address 1510 Fourth Ave., So. Minneapolis, Minn.

CRUDE RUBBER EXPERT
A crude rubber man with seven years' experience in inspecting rubber would like a position as rubber buyer for a tire company, or to give expert advice on crude rubber purchases. Address Box D 200, c/o Motor Age. f

EXPERT DEMONSTRATOR AND REPAIR man open for a position first of year as manager or foreman of garage. At present in an up-to-date garage. Eight years' factory and garage experience. Good technical training. If you want a clean, honest man with push and ability, write Box D 189, c/o Motor Age. mc

FOREMAN TRIMMER—A THOROUGHLY competent foreman on all kinds of work, also experienced in handling men, would like to make a change. Is at present employed by large automobile body concern as foreman. High-grade work preferred. Address Box D 199, care Motor Age. r

GENERAL MANAGER OF AUTOMOBILE branch house desires to make change; can show record 8 successful & profitable years with house I am now with. Box D 192, c/o Motor Age. m

MANAGER OR DISTRICT SALES MAN-ager is open for engagement (until recently employed by Abbott Motor Co., as District Manager). Have thorough knowledge of both retail and wholesale methods, and acquainted throughout both the Middle and Northwest, also Eastern, territory. Am considered to be a first-class, resourceful business producer. Will guarantee to make good; would consider first-class accessory or tire proposition. Desire connection with first-class house where the services of a high-class man will be appreciated, monetarily and otherwise. Address Box D 216, c/o Motor Age. h

MECHANICAL ENGINEER, 10 YEARS' experience in the designing and manufacture of automobiles, wishes to connect himself with progressive motor truck firm as chief engineer or superintendent. Address Box D 229, c/o Motor Age. l

GENERAL SALES AND BUSINESS MAN-ager of large factory branch covering entire South desires to make change. Those in need of high class man of ability and able to make good, address Box D 196, care Motor Age. o

Help Wanted

AAA OPEN POSITIONS
With automobile concerns exclusively. Are just as represented, not "catchy ads." All information confidential. If you are a good man, we want you. Write us today. We may have an opening in your city.

We have stood the test for 10 years. An enormous Engineering Department. Get lined up for Jan. 1st.

Designer, $2500, light car; Works Manager, $3000-$5000, axles and parts; Works Manager, $4000-$6000, trucks; Lay-Out Man, $1200, pleasure chassis. Inspector, $1500-$1800, machine dept.; Demonstrator, $1200, engines; Production Man, $2500; Assembly Demonstrators, $1200-$1500; Designer, $1500, compressors; Designer, $1500-$1800, tools and jigs; Designer, $2500-$4000, engines; Foreman, $1500-$1800, machine shop; Woodwork Foreman, $1500, bodies; Apprentice Director, $1800-$4000, train shop men; Several Bookkeepers, Clerks, and Salesmen; 6 Machinists, 40-45c, lathe, boring mill and dies. Over 50 openings for all kinds shop help, at best wages. Write us immediately. Do it NOW.
BUSINESS MEN'S CLEARING HOUSE,
323, 108 S. La Salle St., Chicago.

MANAGER WANTED IN A CONNECTICUT city for accessory store. Company has $15,000.00 capital and prefers man who can invest $1,000.00. State experience and other details. Address Martin, Box 883, New Haven, Conn. a

MECHANICAL ENGINEERS, SUPERIN-tendents, works managers and designers wanted. The Engineering Agency, Inc., Monadnock Blk., Chicago.

PATENT DRAFTSMAN
Wanted Draftsman having automobile patent drawing experience. Best office in Detroit, good salary and permanent position to right man. Box D 221, c/o Motor Age. p

SALESMAN—ONE WHO IS NOW VISITING automobile trade or owners. Good money made on a very attractive proposition. Sturdy Mfg. Co., 2637 Michigan Ave., Chicago.

WANTED IN MONTANA
A-1 repair man who can handle all kinds of trouble and not afraid of work. Must be absolutely honest and trustworthy. Address Box D 209, c/o Motor Age. s

WANTED—A1 AUTO REPAIR MAN AND machinist. Must be able to take care of all kinds of repair work. Minonk Garage Co., Minonk, Ill.

WANTED—SALESMEN SELLING ACCES-sories on the road to handle our Limousine Heater and gasoline perfect warm mixer as a side line commission; must furnish best of references. United States Manufacturing Co., Troy, N. Y.

Radiator and Lamp Repairing

A-A-A RADIATORS MANUFACTURED and repaired. Leaky radiators of any make repaired and returned same day. We can make any style radiator and ship in 3 days. Prices reasonable. Discount to dealers. Sheppard Co., 1331 Jackson Boul., Chicago.

AA1 AUTO LAMP REPAIRING
All Radiators repaired
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